

# **Amador Water Agency 2010 Urban Water Management Plan**

**September 2011  
(Updated 2014)**

---

## **Table of Contents**

<b>Chapter 1</b>	<b>Plan Preparation</b> .....	<b>1-1</b>
1.1	Introduction.....	1-1
1.2	Integrated Regional Water Management Plan .....	1-1
1.3	Agency Coordination, Notification, & Participation .....	1-2
1.4	Public Participation .....	1-2
<b>Chapter 2</b>	<b>Service Area</b> .....	<b>2-3</b>
2.1	Introduction.....	2-3
2.2	Service Area Climate.....	2-4
2.3	Service Area Description .....	2-4
2.4	Population .....	2-9
<b>Chapter 3</b>	<b>Water System Demands</b> .....	<b>3-11</b>
3.1	Water Demands and Projections .....	3-11
3.2	Water Use Baselines and Targets .....	3-15
3.3	Water Use Reduction Plan .....	3-17
<b>Chapter 4</b>	<b>Existing Sources of Water</b> .....	<b>4-18</b>
4.1	Introduction.....	4-18
4.2	Surface Water .....	4-18
4.3	Groundwater.....	4-19
4.4	Exchange or Transfer Opportunities .....	4-22
4.5	Desalinated Water .....	4-22
4.6	Reclaimed Water .....	4-22
4.7	Summary of Current and Future Water Supplies .....	4-25
4.8	Future Water Projects.....	4-26
<b>Chapter 5</b>	<b>Water Supply Reliability &amp; Contingency Planning</b> .....	<b>5-27</b>
5.1	Introduction.....	5-27
5.2	Reliability .....	5-27
5.3	Contingency Planning.....	5-27
5.4	Water Quality Impacts to Reliability .....	5-30
5.5	Seasonal and Climatic Shortage.....	5-31
5.6	Use Reduction Monitoring .....	5-34
<b>Chapter 6</b>	<b>Demand Management Measures – Section 10631 (f)</b> .....	<b>6-35</b>
6.1	Demand Management Measure 1 .....	6-35
6.2	Demand Management Measure 2 .....	6-36
6.3	Demand Management Measure 3 .....	6-38
6.4	Demand Management Measure 4 .....	6-39
6.5	Demand Management Measure 5 .....	6-40
6.6	Demand Management Measurement 6.....	6-42
6.7	Demand Management Measure 7 .....	6-43
6.8	Demand Management Measure 8 .....	6-45
6.9	Demand Management Measure 9 .....	6-47
6.10	Demand Management Measure 10 .....	6-50
6.11	Demand Management Measure 11 .....	6-52
6.12	Demand Management Measure 12 .....	6-60
6.13	Demand Management Measure 13 .....	6-61
6.14	Demand Management Measure 14 .....	6-62
6.15	Effectiveness Evaluation 15.....	6-63
6.16	Estimate of Savings 16.....	6-63
<b>Chapter 7</b>	<b>Appendices</b> .....	<b>7-1</b>

---

## List of Tables

Table 1-1 Coordination with Appropriate Agencies.....	1-2
Table 2-1: Climate .....	2-4
Table 2-2 Land Use Agency Growth Rates.....	2-9
Table 2-3 Current and Projected Population.....	2-10
Table 3-1 Water Deliveries – Actual, 2005 (AFY).....	3-12
Table 3-2 Water Deliveries – Actual, 2010 (AFY).....	3-12
Table 3-3 Water Deliveries – Projected, 2015 (AFY).....	3-12
Table 3-4 Water Deliveries – Projected, 2020 (AFY).....	3-12
Table 3-5 Water Deliveries – Projected, 2025 (AFY).....	3-13
Table 3-6 Water Deliveries – Projected, 2030 (AFY).....	3-13
Table 3-7 Water Deliveries – Projected, 2035 (AFY).....	3-13
Table 3-8 Low Income Water Demands (AFY).....	3-14
Table 3-9 Sales to Other Water Agencies (AFY) .....	3-14
Table 3-10 Additional Water Uses and Losses (AFY) .....	3-14
Table 3-11 Total Water Use (AFY) .....	3-15
Table 3-12 Base Period Ranges .....	3-16
Table 3-13 Base Daily Per Capita Water Use, 10-15 Year Range .....	3-16
Table 3-14 Base Daily Per Capita Water Use, 5 Year Range .....	3-17
Table 4-1 Historic Groundwater Levels in Cosumnes Subbasin .....	4-20
Table 4-2 Amount of Groundwater Pumped <sup>a</sup> (AF) .....	4-21
Table 4-3 Amount of Groundwater Projected to be Pumped (AFY).....	4-22
Table 4-4 2010 Agency Wastewater Collection and Treatment Systems .....	4-23
Table 4-5 Agency Wastewater Collection and Treatment Volumes (AF).....	4-24
Table 4-6 Non-Agency Wastewater Collection and Treatment Systems .....	4-24
Table 4-7 Current and Planned Water Supplies (AFY).....	4-26
Table 5-1 Preparation Actions for a Catastrophe .....	5-28
Table 5-2 Water Shortage Contingency - Mandatory Prohibitions .....	5-28
Table 5-3 Consumption Reduction Methods.....	5-29
Table 5-4 Water Shortage Contingency - Rationing Stages to Address Water Supply Shortages.....	5-30
Table 5-5 Penalties and Charges .....	5-30
Table 5-6 Projected Normal Water Supply <sup>a</sup> (AFY).....	5-32
Table 5-7 Supply and Demand Comparison - Normal Year (AFY) .....	5-32
Table 5-8 Supply and Demand Comparison – Single Dry Year (AFY) .....	5-33
Table 5-9 Supply and Demand Comparison – Multiple Dry Years (AFY).....	5-33
Table 5-10 Water Use Monitoring Mechanisms.....	5-34
Table 6-1: Projected Water Survey Program.....	6-36
Table 6-2 Planned Residential Plumbing Retrofits .....	6-37
Table 6-3 Planned Commodity Rate Metering and Retrofits .....	6-40
Table 6-4: Planned Large Landscape Conservation Programs .....	6-42
Table 6-5: HECWs Rebate Program.....	6-43
Table 6-6: Planned Public Education Programs .....	6-45
Table 6-7: Planned School Education Presentations .....	6-47
Table 6-8: Demonstrated CII Water Savings <sup>1</sup> .....	6-49
Table 6-9: Estimated CII Programs .....	6-50
Table 6-10: Agency CII Rebates .....	6-50
Table 6-11: Planned Assistance to Retail Agencies .....	6-52
Table 6-12: CUWCC Goals for DMM 11.....	6-54
Table 6-13: Amador Water Agency Conservation Pricing.....	6-55

---

Table 6-14: Example Water Pricing.....	6-56
Table 6-15: Example Wastewater Pricing .....	6-59
Table 6-16: Single Family WSS Toilet Replacement Program.....	6-63
Table 6-17: Estimate of Water Savings.....	6-64

**List of Figures**

Figure 2-1: Amador Water Agency Water Systems .....	2-3
Figure 2-2: Map of Amador County.....	2-5
Figure 2-3: Amador Water System Service Area .....	2-6
Figure 2-4: Central Amador Water Project Service Area .....	2-7
Figure 2-5: Lake Camanche Village Service Area .....	2-8
Figure 2-6: La Mel Heights Service Area .....	2-9
Figure 4-1 Map of Cosumnes Subbasin and Amador Water Agency Wells .....	4-20

**Appendices**

Appendix A	References
Appendix B	Completed UWMP Checklist
Appendix C	Public Agency Notifications
Appendix D	Public Notices
Appendix E	Resolution for Adoption
Appendix F	Land Use Agencies' Growth Projections
Appendix G	Agency Water Conservation Plan
Appendix H	Agency Water Code
Appendix I	Public Water System Statistic, Department of Water Resources (1994-2010) for Tanner, Lone, CAWP, La Mel & Camanche
Appendix J	Amador Water Agency Emergency Handbook

---

## **List of Abbreviations**

AF	Acre-feet
AFY	Acre-feet per year
Agency	Amador Water Agency
ARSA	Amador Regional Sanitation Agency
AWS	Amador Water System
CAWP	Central Amador Water Project
CEQA	California Environmental Quality Act
cfs	cubic feet per second
CII	Commercial, Industrial, and Institutional
DHS	California Department of Health Services
DMM	Demand Management Measure
DWR	California Department of Water Resources
EBMUD	East Bay Municipal Utility District
edu	Equivalent Dwelling Unit
EID	El Dorado Irrigation District
EIR	Environmental Impact Report
ETo	Reference EvapoTranspiration
gpcd	gallons per capita day
gpd	gallons per day
gpm	gallons per minute
HEWM	High Efficiency Washing Machine
ID	Improvement District
IRWMP	Integrated Regional Water Management Plan
mgd	Million gallons per day
NPDES	National Pollutant Discharge Elimination System
PG&E	Pacific Gas and Electric
ULFT	Ultra-Low-Flush Toilet
UWMP	Urban Water Management Plan
WWID	Wastewater Improvement District

## Chapter 1 Plan Preparation

### 1.1 Introduction

This Urban Water Management Plan ('UWMP') has been prepared in accordance with the Urban Water Management Act ('Act'). The Act is defined by the California Water Code, Division 6, Part 2.6, and §§10610 through §§10657. 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. The Act requires urban water suppliers providing municipal water to more than 3,000 connections or supplying more than 3,000 ac-ft of water annually to adopt and submit a plan every five years to the California Department of Water Resources (DWR). Subsequent assembly bills have amended the Act. In complying with the Act, the DWR Guidebook to Assist Urban Water Suppliers has been followed, as shown in the comprehensive checklist found in Appendix B . This 2010 UWMP provides an update to the 2005 UWMP.

Amador Water Agency ('Agency') provides potable and raw water to more than 25,000 people for municipal, industrial, and irrigation uses as well as wastewater collection and treatment services to meet the needs of our customers. While demands for Agency water have flattened during this recession, the Agency intends to use this UWMP to manage the Agency's water supplies and water demands over a range of normal and emergency conditions.

The Agency is committed to maximizing available water resources and minimizing the need to obtain additional water supplies. The Agency has done this and will continue to do this by utilizing water management tools and developing strategic partnerships with upstream, downstream, and nearby agencies and districts. As outlined in the Agency's Water Conservation Plan, water conservation practices will be implemented to mitigate identified shortfalls caused by drought-induced water shortages in addition to an on-going study of a regional water reclamation solution. Management practices can be developed and implemented to address various contingencies arising from an analysis of demand versus supply. The Agency is committed to working with the public and other agencies to facilitate regional water management efforts.

### 1.2 Integrated Regional Water Management Plan

The Agency recognizes that water is a regional resource as well as a local one. Therefore, regional partnerships in addition to projects and measures play a large role in maximizing resources. The Agency is currently partnering with numerous regional entities to develop an Integrated Regional Water Management Plan (IRWMP) for the Mokelumne River watershed in and around Amador County. 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 Agency participated in completing the first IRWMP for the Mokelumne Watershed. Known as the Mokelumne Amador Calaveras IRWMP ('MAC IRWMP'), the MAC IRWMP established itself as one of the first regional plans in the state. The MAC IRWMP is under the governance of the Upper Mokelumne River Watershed Authority ([www.umrwa.org](http://www.umrwa.org)) and was successful in the State's Regional Acceptance Program (RAP) as a state-recognized IRWMP geographic area.

There is also unintentional water transfer downstream to EBMUD whenever the Agency does not utilize its full contractual water right. The Agency predicts that, by working with their numerous partners and implementing the programs described throughout this plan, they will be able to continue managing and efficiently using their existing water supply sources through at least the year 2030.

### 1.3 Agency Coordination, Notification, & Participation

The Act requires the Agency to coordinate the preparation of its UWMP with other appropriate agencies in the area, including other water suppliers that share a common source, water management agencies, and relevant public agencies, to the extent practicable. As required by the Act, the Agency sent letters to Amador County, the cities of Amador City, Ione, Jackson, Plymouth and Sutter Creek 60 days prior to adoption that the Plan was being reviewed and amended (Appendix C). Several agencies were consulted to compile data relevant to the 2010 update of the Agency's UWMP. Table 1-1 summarizes the UWMP coordination efforts with the necessary agencies and other stakeholders.

**Table 1-1 Coordination with Appropriate Agencies**

Agency	Was Contacted for Assistance	Participated in Developing the Plan	Commented on Draft	Attended Public Meetings	Was Sent Copy of Draft Plan	Was Sent Notice of Intention to Adopt
California Department of Water Resources (DWR)	X				X	
Amador County	X				X	X
City of Amador	X				X	X
City of Jackson	X				X	X
City of Ione	X				X	X
City of Plymouth	X				X	X
City of Sutter Creek	X				X	X

Additionally, the Agency will provide copies of the UWMP to all water retailers/suppliers to whom the Agency sells water wholesale.

### 1.4 Public Participation

The Act requires the encouragement of public participation and a public hearing as part of the UWMP approval process. As required by the Act, prior to adopting the update of the Plan, the Agency twice published a public notice in the Amador Ledger-Dispatch (Appendix D) highlighting the plan requirements, noting draft report availability, public hearing date and opportunity to comment. The Plan was made available for public inspection at the Agency's office as well as on the Agency's website ([www.amadorwater.org](http://www.amadorwater.org)). A public hearing was held on August 11, 2011 to provide an opportunity for Agency's customers and residents 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.

The Plan was adopted by the Agency's Board of Directors on August 25, 2011. A copy of the adopted resolution is provided in Appendix E. Within 30 days of adoption of the UWMP, a copy will be submitted to the Amador County Library and will be available at the Agency as well as on the Agency website for public review. A copy of the adopted UWMP will be provided to Amador County and the cities of Amador City, Ione, Jackson, Plymouth and Sutter Creek within 60 days after submission to DWR. Additionally, copies will be provided to all water retailers who purchase water wholesale from the Agency.

## Chapter 2 Service Area

### 2.1 Introduction

Amador Water Agency was formed in 1959 for the purpose of providing water and wastewater services to the residents of Amador County. The Agency has four general service areas: the Amador Water System, the Central Amador Water Project System, La Mel Heights, and Lake Camanche Village. These service areas are shown in **Figure 2-1**.

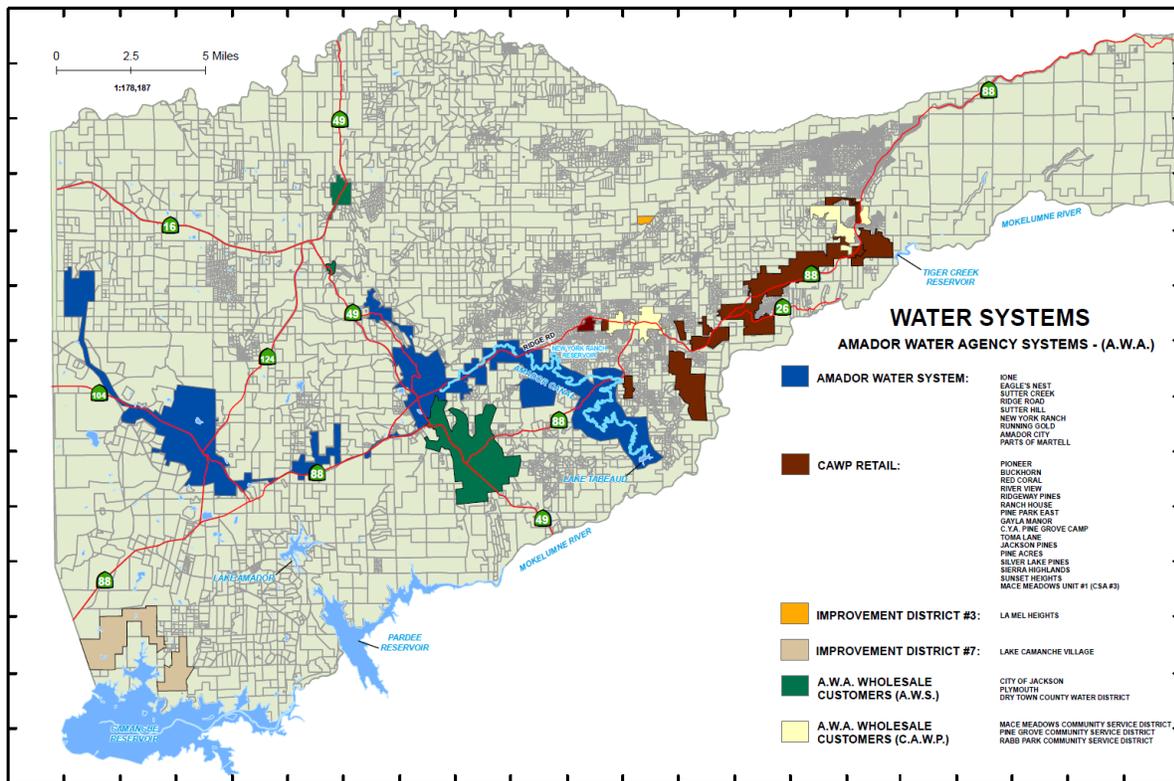
The Amador Water System (AWS) was formerly owned and operated by PG&E and currently serves the areas of Jackson, Martell, Sutter Creek, Sutter Hill, Ione, Amador City, Plymouth and Drytown. The Agency has two water treatment plants at Sutter Hill and Ione, but also serves raw (untreated) water from the Amador Canal to customers between Lake Tabeaud and Sutter Hill, and Sutter Hill and Ione.

The Central Amador Water Project (CAWP) System provides wholesale water to the communities of First Mace Meadows Water Association, Pine Grove Community Services District (CSD), and Rabb Park CSD. The CAWP System is also used to provide retail water to Mace Meadows Unit #1 (CSA #2), Sunset Heights, Jackson Pines, C.Y.A. Pine Grove Camp, Pine Acres, Ranch House, Pioneer, Ridgeway Pines, Silver Lake Pines, Sierra Highlands, Buckhorn, Red Coral, River View, Pine Park East, Gayla Manor, and Toma Lane.

The Lake Camanche Village is a major subdivision consisting of several Units (subdivisions) in western Amador County. The Agency supplies both water and wastewater services to this area, with water supplies coming from groundwater rather than the Mokelumne River (as with the other two service areas).

The Agency currently serves a population of approximately 25,640 people through more than 13,000 retail and wholesale water service connections. The Board of Directors is comprised of five members elected by the citizens within districts that mirror the Amador County Board of Supervisor districts.

**Figure 2-1: Amador Water Agency Water Systems**



## 2.2 Service Area Climate

The Agency's main water supply is the Mokelumne River, a snow and rain fed river originating in the Sierra Nevada. The Mokelumne River watershed is a relatively narrow and steep watershed located northeast of the Sacramento-San Joaquin Delta on the western slope of the Sierra Nevada. The watershed, upstream of Camanche Dam, covers an area of 627 square miles and extends from Highland Peak (elevation 10,934 feet above sea level) near the crest of the Sierra Mountains to Camanche Reservoir (elevation 235 feet above sea level) located in the lower western foothills near Clements.

Annual precipitation (rainfall and snowfall) in the Mokelumne River Watershed, and thus river runoff, is extremely variable in Northern California. Within a year, precipitation is highly seasonal with most precipitation normally occurring between November and May and very little occurring between late spring and fall. Peak flows in the Mokelumne River normally occur during winter storms or during the spring snow-melt season from March through June. River flows decrease to a minimum in late summer or fall.

Amador County has a varying range of temperature and precipitation. The Sierra Nevada foothill areas experience hot, dry summers and mild winters. The higher elevations, about 5,000 feet, experience long and severe winters accompanied by heavy snowfall. Table 2-1 shows typical reference evapotranspiration (ET<sub>o</sub>), precipitation and temperature values.

**Table 2-1: Climate**

Month	Jan	Feb	Mar	Apr	May	Jun	Jul
Standard Average ET <sub>o</sub> a (in.)	1.40	2.10	3.41	4.95	6.67	7.80	8.84
Average Rainfall <sup>b</sup> (in.)	5.48	4.49	4.93	2.59	0.96	0.32	0.11
Average Temperature <sup>b</sup> (deg F)	45.46	49.47	52.33	57.17	64.04	71.06	76.77

Month	Aug	Sep	Oct	Nov	Dec	Annual
Standard Average ET <sub>o</sub> a (in.)	7.75	5.70	3.88	1.95	1.24	55.65
Average Rainfall <sup>b</sup> (in.)	0.12	0.49	1.62	3.82	4.65	29.57
Average Temperature <sup>b</sup> (deg F)	75.33	71.30	63.13	52.83	45.98	60.47

Footnotes:

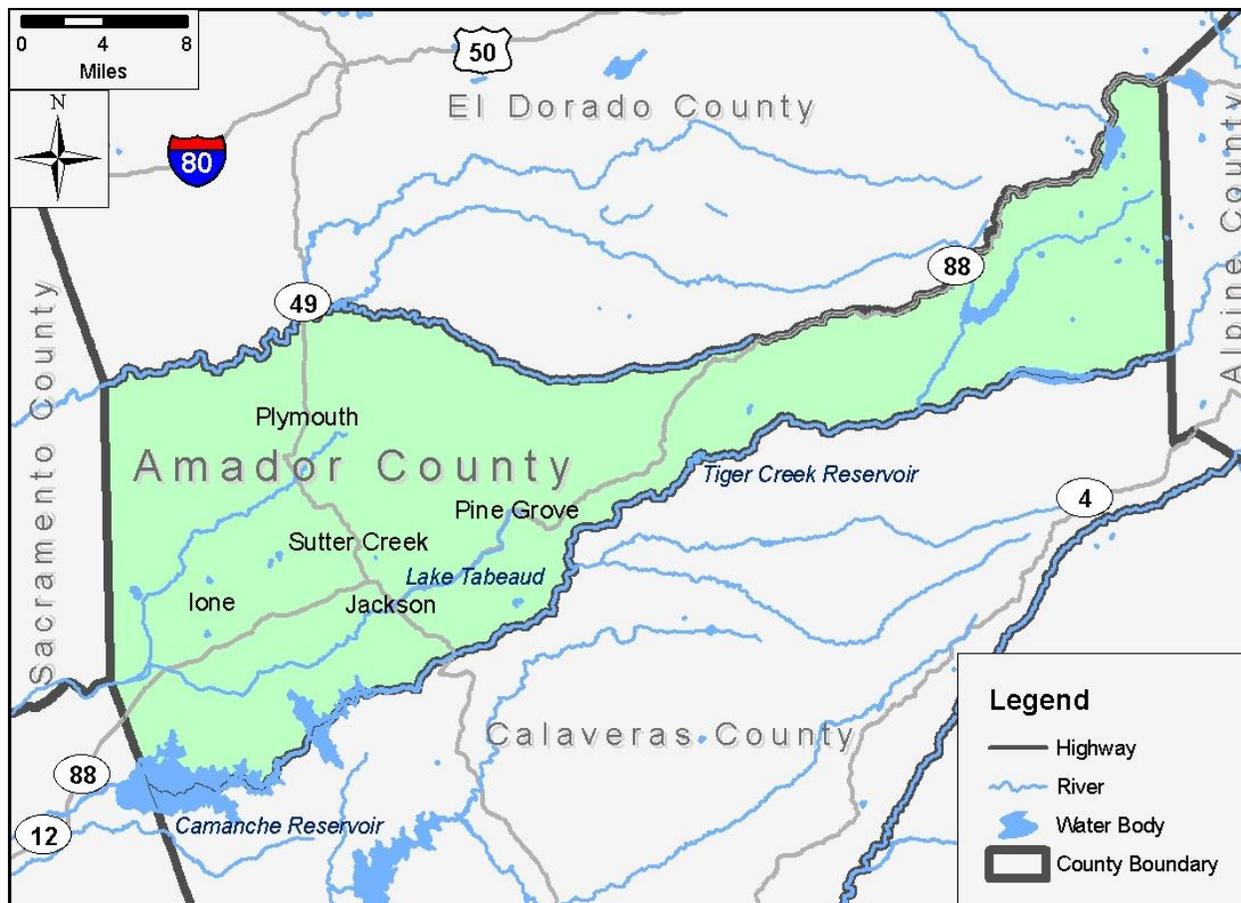
- a. Source: CIMIS ET<sub>o</sub> Map using an average of Zones 13 and 14
- b. Source: Western Regional Climate Center #042728, Electra Power House

## 2.3 Service Area Description

The Agency is the main water purveyor for the western portion of Amador County. The Agency has the legal jurisdiction to serve water throughout Amador County (see **Figure 2-2**). The primary source of water is the Mokelumne River watershed which supplies the Agency's main water systems: the Amador Water System (AWS) and the Central Amador Water Project (CAWP). Lake Camanche Village and La Mel

Heights are served primarily through groundwater. There are a total of 7,465 water service connections in the Agency's service area, not including wholesale entity customers.

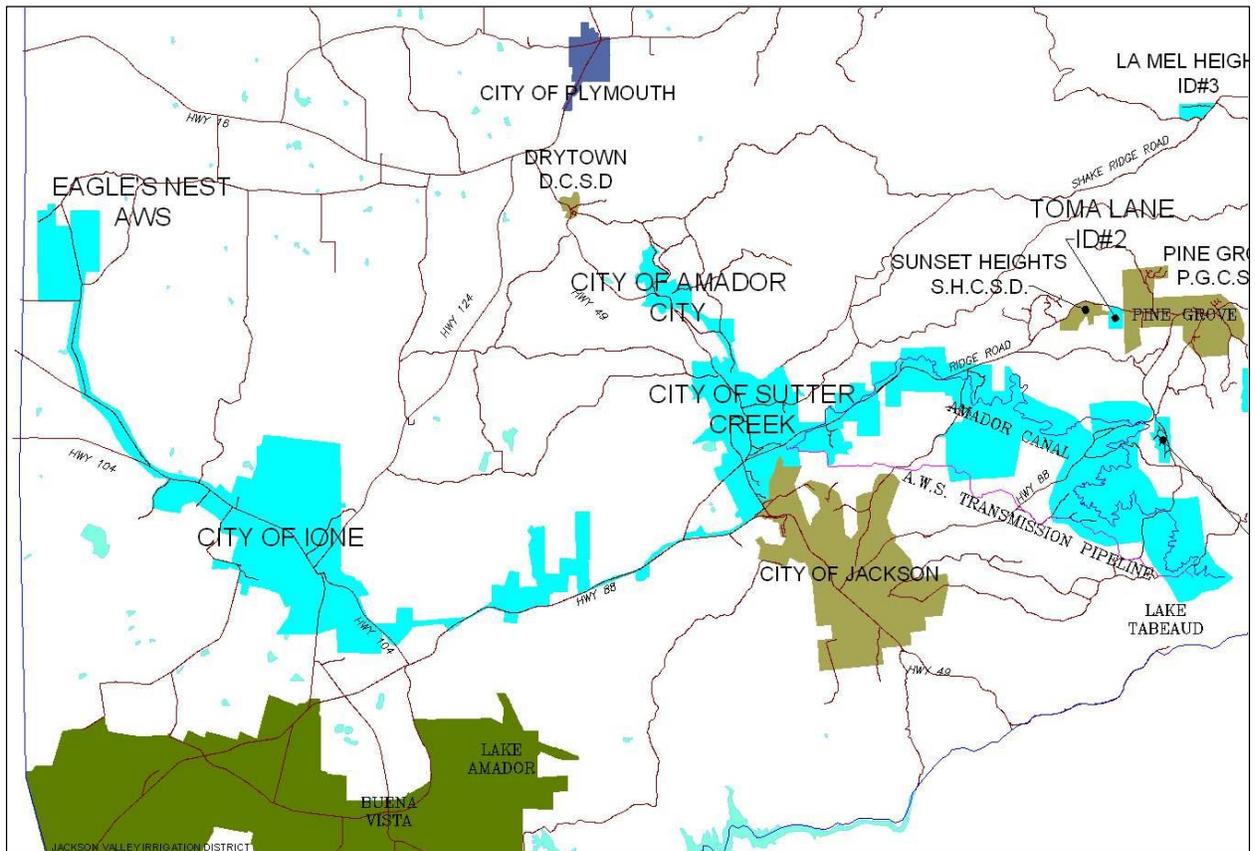
Figure 2-2: Map of Amador County



### Amador Water System

The Amador Water System ('AWS') receives water from the Mokelumne River via Lake Tabeaud. The AWS delivery system consists of approximately 120 miles of water main piping for potable water customers and 23 miles of conveyance canals for untreated water customers. The Agency supplies both raw and treated water to customers in the AWS. Treated water supplied to AWS customers comes from the Ione Water Treatment Plant located in Ione or the Tanner Water Treatment Plant located in Sutter Creek. The service area covers over 450 square miles and serves the communities of Amador City, Ione, Sutter Creek, Sutter Hill and their vicinities, and portions of Ridge Road and New York Ranch Road. The Agency also provides wholesale water through the AWS to the communities of Jackson, Plymouth and Drytown. In addition, the system also supplies raw water for agricultural, industrial, commercial and domestic irrigation needs to both public facilities and individual raw water customers. There are 3,670 metered service connections in the AWS. Figure 2-3 shows the AWS service area.

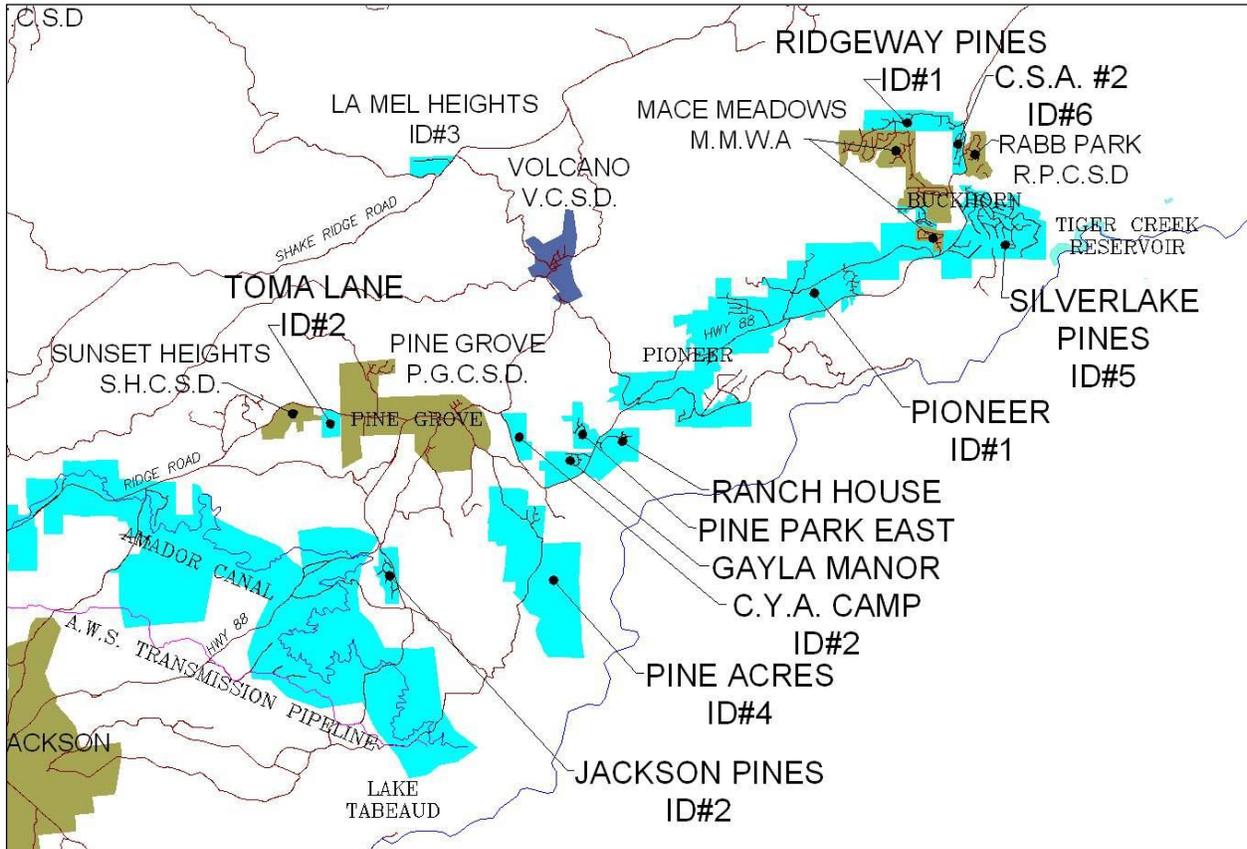
Figure 2-3: Amador Water System Service Area



### Central Amador Water Project System

The Central Amador Water Project System ('CAWP') receives water from the Mokelumne River via Pacific Gas and Electric (PG&E)'s Tiger Creek Afterbay. Water supplied to CAWP customers is treated at the Buckhorn Water Treatment Plant located in Pioneer. The CAWP delivery system consists of approximately 90 miles of water main piping for potable water customers. The CAWP provides wholesale treated water to the upcountry communities of First Mace Meadows Water Association, Pine Grove Community Service District ('CSD'), and Rabb Park CSD. In addition to delivering wholesale water, the Agency also retails domestic water to 3,005 service connections in the communities of Jackson Pines, Pine Acres, Pioneer, Ridgeway Pines, Ranch House, Silver Lake Pines, the Sunset Heights area, Buckhorn, Red Coral, River View, Pine Park east, Gayla Manor, Toma Lane, and Sierra Highlands. Figure 2-4 shows the CAWP service area.

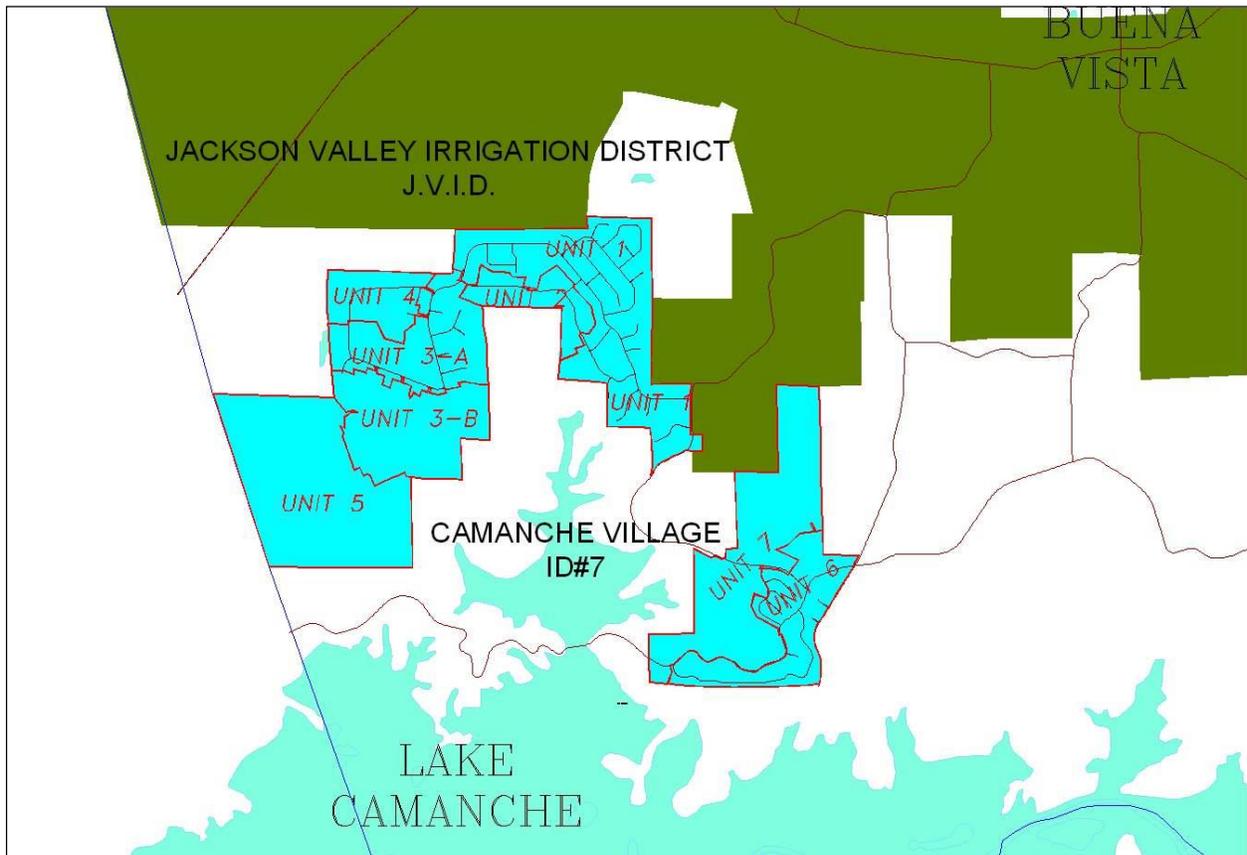
Figure 2-4: Central Amador Water Project Service Area



**Lake Camanche Village Area**

The Agency provides water service to 733 connections and small commercial businesses in the Lake Camanche Village area. The domestic water supply for Lake Camanche Village is currently based on groundwater which is treated by chlorine addition at each well head located throughout the Improvement District 7 (ID #7). Figure 2-5 shows the Lake Camanche Village service area.

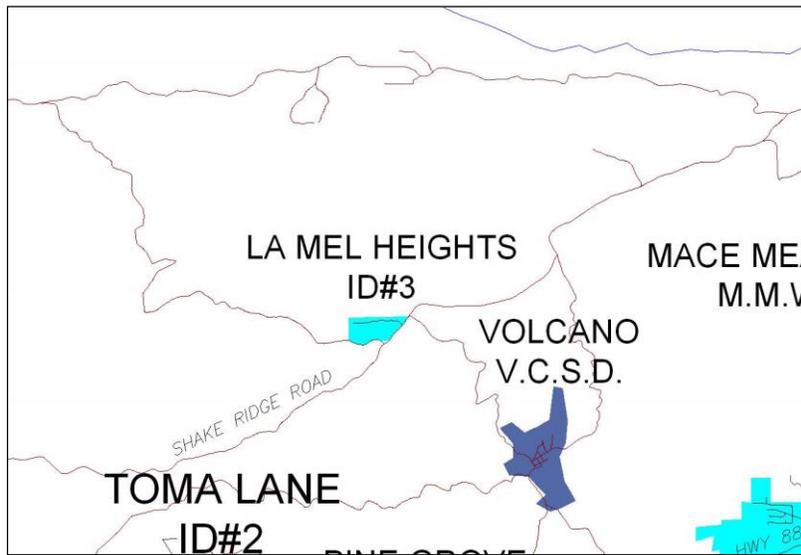
Figure 2-5: Lake Camanche Village Service Area



### La Mel Heights

The Agency provides water service to La Mel Heights, a 57 unit subdivision. The only water supply is groundwater which is treated at the Improvement District 3 (ID #3) Water Treatment Plant. Figure 2-6 shows the La Mel Heights service area.

Figure 2-6: La Mel Heights Service Area



## 2.4 Population

Over time, the Agency has transitioned from serving mainly agricultural customers, to one that serves primarily residential, commercial, and industrial sectors although agriculture remains a significant water user. From 1995 to 2010, the individual service area populations grew between 14% and 17%, with the overall average population served by the Agency increasing 15%.

Growth projections utilized in this UWMP were obtained from the land use planning agencies within Amador County (Appendix F) and were based on historical patterns, market research, and new housing unit commitments (e.g., issued permits or approved subdivisions) for the near future. Analysis of services other than water, wastewater or reclaimed water are outside of the purview and authority of this UWMP and were therefore not considered by the Agency. The Agency therefore relied on the land use agencies expertise. Their reported calculations and projections analyzed the ability for services to accommodate their respective projected levels of development.

Taking the average projected growth rates from the land use agencies over the Agency’s respective service areas yields an average annual projected growth rate of 1.8%, compared with a state annual growth rate of 1.4%. Table 2-2 below shows the population growth rates provided by the planning agencies and applied over the corresponding portions of the Amador Water Agency’s service areas.

Table 2-2 Land Use Agency Growth Rates

Land Use Agency	Service Area(s)	Population Growth Rate
Amador County	AWS, CAWP, Lake Camanche, La Mel	1.7%
City of Amador City	AWS (Tanner)	0.0%
City of Ione	AWS (Ione)	2.3%
City of Jackson	AWS (Tanner)	1.0%
City of Plymouth	AWS (Tanner)	4.0%
City of Sutter Creek	AWS (Tanner)	0.5%

In addition to projected residential growth, potential increased demand for agricultural, commercial, industrial and raw water use is anticipated by the land use agencies. Currently the Agency is studying a regional reclamation solution to offset such demands by supplementing or replacing some raw water use with recycled water where appropriate. As connections increase, water management planning will include an assessment of wastewater disposal and associated recycled water options. See Table 2-3 for a summary of land use agency population projections through 2030.

**Table 2-3 Current and Projected Population**

	2010	2015	2020	2025	2030
Total Service Area Population	25,640	27,880	30,448	33,374	36,766

Footnotes:

- a) Service area consists of Amador Water System (Ione & Tanner), Central Amador Water Project, Lake Camanche Village, and La Mel Heights.
- b) Department of Finance data consisting of population per unit for 2010 was used to determine service area population for each five-year interval.
- c) Growth projections are based on data provided by each land use agency.
- d) Population projections include populations within the service area of six wholesale customers.
- e) Number of units in future multi-family residences was calculated as two.
- f) No change to the 2010 Group Quarter population was assumed.
- g) No growth was assumed for City of Amador as no growth projections were received.
- h) Remaining 17 undeveloped lots in La Mel were projected out over 10 years.

## Chapter 3 Water System Demands

This section describes the Amador Water Agency's system demands, including calculating its baseline daily per capita water use and interim and urban water use targets as described in SBx7-7 for the Amador Water System (AWS), the Central Amador Water Project (CAWP), La Mel Heights (La Mel) and Lake Camanche Village (LCV). The current water system demand and projections by category are quantified over the planning horizon of the UWMP. These demands and projections include treated and raw water sales, water sales to other agencies, system water losses, and water use target compliance. When calculating future water demands, projected demands were based on the assumed reduction in per capita daily use determined from planning for and implementing actions associated with the Water Conservation Bill of 2009.

This section follows the technical methods and methodologies described in Methodologies for Calculating Baseline and Compliance Urban Per Capita Water Use (For the Consistent Implementation of the Water Conservation Bill of 2009) (DWR 2010a). The approach and criteria for developing the required baselines and targets are thoroughly described in the California Department of Water Resources Guidebook to Assist Urban Water Suppliers to Prepare a 2010 Urban Water Management Plan.

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 Agency's customers. The Agency will serve most of the new projected growth and water demands within Amador County. This chapter summarizes past water use and future water demand projections through 2030.

### 3.1 Water Demands and Projections

Projected populations and respective water demands are taken from the Amador County General Plan, Amador County Housing Element, City of Jackson Housing Element, City of Plymouth Housing Element, City of Ione General Plan, City of Sutter Creek Housing Element, Amador Local Agency Formation Commission Municipal Services Review, and the City of Sutter Creek Wastewater Master Plan as shown in Section 2.4 Population. Projected demands are calculated based on the projected growth (residential, commercial, and industrial) shown in the above general plans and housing elements, the Amador County Housing Element average persons per household of 2.25 and the calculated daily per capita water use target for 2020 as described in SBx7-7.

Water use is presented in the following AWA defined user categories: single family residential; multi-family residential; commercial/ institutional; industrial; Drytown County Water District; City of Jackson; Mace Meadows Water Association; Pine Grove Community Services District; City of Plymouth; Rabb Park Community Services District; Backwash Water; Raw Water Billed; Raw Water Losses; Recycled Water; and System Losses.

Tables 3-1 through 3-11 provide summaries of actual and projected water uses.

Table 3-1 Water Deliveries – Actual, 2005 (AFY)

Water Use Sectors	Metered		Non Metered		Total
	# of Accounts	Volume	# of Accounts	Volume	Volume
Single Family	6,005	1,895	100	121	2,016
Multi-Family	31	152	0	0	152
Commercial/Institutional	242	1,144	0	0	1,144
Industrial	0	0	0	0	0
Total	6,278	3,192	100	121	3,312

Footnotes:

- a. FY 2006-07 volumes are used in 2005 where 2005 actual data no longer exists.

Table 3-2 Water Deliveries – Actual, 2010 (AFY)

Water Use Sectors	Metered		Non Metered		Total
	# of Accounts	Volume	# of Accounts	Volume	Volume
Single Family	6,308	1,776	11	13	1,790
Multi-Family	30	161	0	0	161
Commercial/Institutional	346	1,088	1	1	1,089
Industrial	9	89	0	0	89
Total	6,693	3,115	12	14	3,129

Table 3-3 Water Deliveries – Projected, 2015 (AFY)

Water Use Sectors	Metered		Non Metered		Total
	# of Accounts	Volume	# of Accounts	Volume	Volume
Single Family	6,873	1,988	0	0	1,988
Multi-Family	116	193	0	0	193
Commercial/Institutional	940	1,311	0	0	1,311
Industrial	30	97	0	0	97
Total	7,959	3,590	0	0	3,590

Footnotes:

- a. 149 gallons of water delivered per capita per day was used (2010 actual delivery per capita).

Table 3-4 Water Deliveries – Projected, 2020 (AFY)

Water Use Sectors	Metered		Non Metered		Total
	# of Accounts	Volume	# of Accounts	Volume	Volume
Single Family	7,538	2,238	0	0	2,238
Multi-Family	206	227	0	0	227
Commercial/Institutional	1,537	1,536	0	0	1,536
Industrial	51	105	0	0	105
Total	9,332	4,106	0	0	4,106

Footnotes:

- a. 149 gallons of water delivered per capita per day was used (2010 actual delivery per capita).

**Table 3-5 Water Deliveries – Projected, 2025 (AFY)**

Water Use Sectors	Metered		Non Metered		Total
	# of Accounts	Volume	# of Accounts	Volume	Volume
Single Family	8,296	2,523	0	0	2,523
Multi-Family	306	265	0	0	265
Commercial/Institutional	2,152	1,767	0	0	1,767
Industrial	117	130	0	0	130
Total	10,871	4,684	0	0	4,684

Footnotes:

- a. 149 gallons of water delivered per capita per day was used (2010 actual delivery per capita)..

**Table 3-6 Water Deliveries – Projected, 2030 (AFY)**

Water Use Sectors	Metered		Non Metered		Total
	# of Accounts	Volume	# of Accounts	Volume	Volume
Single Family	9,107	2,827	0	0	2,827
Multi-Family	406	302	0	0	302
Commercial/Institutional	2,755	1,993	0	0	1,993
Industrial	183	154	0	0	154
Total	12,451	5,277	0	0	5,277

Footnotes:

- b. 149 gallons of water delivered per capita per day was used (2010 actual delivery per capita).

**Table 3-7 Water Deliveries – Projected, 2035 (AFY)**

Water Use Sectors	Metered		Non Metered		Total
	# of Accounts	Volume	# of Accounts	Volume	Volume
Single Family	9,970	3,151	0	0	3,151
Multi-Family	506	340	0	0	340
Commercial/Institutional	3,358	2,219	0	0	2,219
Industrial	249	179	0	0	179
Total	14,083	5,890	0	0	5,890

Footnotes:

- a. 149 gallons of water delivered per capita per day was used (2010 actual delivery per capita).

**Table 3-8 Low Income Water Demands (AFY)**

Low Income Water Demands	2015	2020	2025	2030
Single-Family Residential	85	86	87	89
Multi-Family Residential	31	32	36	54
Total	115	118	123	142

Footnotes:

- Number of low-income connections for Plymouth based on data provided by the City of Plymouth.
- Number of low-income connections for Ione based on multi-family connections per City of Ione letter.
- Number of low-income connections for all other areas based on 38% of growth projected per the Land Use Agency's letter.
- 149 gallons of water delivered per capita per day was used (2010 actual delivery per capita).
- Persons per unit is based on 2010 data from California Department of Finance.
- Low-income households are defined as 80% or below of median household income.

**Table 3-9 Sales to Other Water Agencies (AFY)**

Water Distributed	2005	2010	2015	2020	2025	2030
Drytown CSD	46	34	39	45	50	56
Jackson, City of	1,369	950	983	1,021	1,062	1,104
Mace Meadows WA	85	87	95	103	112	120
Pine Grove CSD	169	149	156	163	170	177
Plymouth, City of	0	144	193	253	327	418
Rabb Park CSD	15	13	16	18	21	23
Total	1,683	1,377	1,482	1,604	1,742	1,899

Footnotes:

- Mace Meadows, Pine Grove & Rabb Park are 11.2%, 10.1% & 3.5% respectively of the overall number of CAWP connections.
- Drytown is 1.4% of the overall number of Tanner connections.
- 149 gallons of water delivered per capita per day was used (2010 actual delivery per capita).
- Water use previously accounted for, in Tables 3-1 through 3-6, is not included in this table.

**Table 3-10 Additional Water Uses and Losses (AFY)**

Water Use	2005	2010	2015	2020	2025	2030
Backwash Water	143	90	103	118	135	153
Raw Water Billed	1,179	1,023	1,023	1,023	1,023	1,023
Raw Water Losses	2,907	2,343	2,343	2,343	2,343	2,343
Recycled Water	0	0	0	0	0	0
System losses	509	446	511	585	667	752
Total	4,738	3,901	3,980	4,068	4,168	4,270

Footnotes:

- Backwash water at Ione and Tanner Water Treatment Plants is currently 3.8% and is assumed to remain constant.
- Raw Water losses includes water pumped/siphoned from Lake Tabeaud less raw water intake at Tanner and Ione treatment plants, and include Amador Canal losses.
- Raw Water Billed and Raw Water Losses is assumed to remain constant and not be proportional to urban growth.
- Projected recycled water use excludes Gold Rush per Sutter Creek Wastewater Master Plan.

- e. System Losses are unmetered water use resulting from system leaks, unauthorized connections, private fire service, fire support services, flushing programs, and meter inaccuracies. In 2010 the Agency's system losses were 15% which is equivalent to the general 15% for rural water districts and is expected to be proportional to growth.
- f. Water use previously accounted for, in Tables 3-1 through 3-6 and 3-8, is not included in this table.

**Table 3-11 Total Water Use (AFY)**

Water Use	2005	2010	2015	2020	2025	2030
Total water deliveries (from tables 3-1 to 3-6)	3,312	3,129	3,590	4,106	4,684	5,277
Sales to other water agencies (from table 3-8)	1,683	1,377	1,482	1,604	1,742	1,899
Additional water uses and losses (from table 3-9)	4,738	3,901	3,980	4,068	4,168	4,270
Total	9,733	8,407	9,052	9,778	10,594	11,446

## 3.2 Water Use Baselines and Targets

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. As required by the Water Conservation Act of 2009, the Agency has used the four step process to develop baseline and target values and selected a methodology to meet the target as outlined below.

Base period totals are for Agency retail distribution service areas only and do not include populations served by other water agencies shown in Table 3-8 or outside of Agency service areas. See appendix for distribution system population and volume calculations.

The Agency does not receive wholesale treated water supply from another retail agency.

### Step 1 – Determine Base Daily per Capita Water Use

The Agency recycled water supply was less than 10% of the total supply in 2008, therefore the base period range for determining the baseline daily per capita water use is 10 years. Tables 3-11 and 3-12 provide the calculations used to determine the baseline.

**Table 3-12 Base Period Ranges**

Base	Parameter	Value	Units
10 to 15 year base period	2008 total water deliveries	4,279	AFY
	2008 total volume of delivered recycled water	0	AFY
	2008 recycled water as a percent of total deliveries	0.00	%
	Number of years in base period	10	Years
	Year beginning base period	2001	
	Year ending base period	2010	
5 year base period	Number of years in base period	5	Years
	Year beginning base period	2001	
	Year ending base period	2005	

Footnotes:

- If the 2008 recycled water percent is less than 10 percent, then the first base period is a continuous 10-year period. If the amount of recycled water delivered in 2008 is 10 percent or greater, the first base period is a continuous 10- to 15-year period.
- The ending year must be between December 31, 2004 and December 31, 2010.

**Table 3-13 Base Daily Per Capita Water Use, 10 Year Range**

Base Period Year		Distribution System Population	Daily System Gross Water Use (mgd)	Annual Daily Per Capita Water Use (gpcd)
Sequence Year	Calendar Year			
Year 1	2001	14,886	3.46	233
Year 2	2002	16,595	3.13	188
Year 3	2003	18,322	3.40	186
Year 4	2004	19,137	3.75	196
Year 5	2005	19,092	3.54	185
Year 6	2006	19,391	3.86	199
Year 7	2007	19,648	3.76	191
Year 8	2008	18,666	3.52	188
Year 9	2009	18,686	3.42	183
Year 10	2010	18,644	3.18	170
Base Daily Per Capita Water Use				192

### Step 2 – Determine Urban Water Use Target

The Department of Water Resources provided four methods that an urban water supplier may choose from to develop its water use target. The Agency has selected Method 1, 80% of the base daily per capita use, to meet the urban water use target. The calculated base daily per capita use from Table 3-11 is 192 gpcd, therefore the target is 154 gpcd for 2020.

### Step 3 – Confirm Urban Water Use Target

Table 3-13 provides the annual daily per capita use for a 5-year period. Since the 5-year base daily per capita water use is not less than 100 gpcd, 95% of the 5-year base daily per capita water use was also calculated which is 188. The use target of 154 gpcd is compared to the 5-year base period to confirm that

the use target meets a minimum threshold. Since the target use of 154 gpcd is less than the 95% of the 5-year base daily per capita water use of 188, no adjustments are needed.

**Table 3-14 Base Daily Per Capita Water Use, 5 Year Range**

Base Period Year		Distribution System Population	Daily System Gross Water Use (mgd)	Annual Daily Per Capita Water Use (gpcd)
Sequence Year	Calendar Year			
Year 1	2001	14886	3.46	233
Year 2	2002	16595	3.13	188
Year 3	2003	18322	3.40	186
Year 4	2004	19137	3.75	196
Year 5	2005	19092	3.54	185
Base Daily Per Capita Water Use				198

#### Step 4 – Determine Interim Urban Water Use Target

The interim water use target is 90% of the base daily per capita use, to meet the urban water use target. Therefore, the interim water use target is 173 gpcd for 2015.

### 3.3 Water Use Reduction Plan

The Agency proposes to use the following actions to meet the use target:

- Expanded use of recycled water
- Capital improvements in the water system to reduce leakage
- Implementation of the Best Management Practices under the California Urban Water Conservation Council Memorandum of Understanding
- Conversion of raw water ditches to piped segments
- Water meter change-outs
- Conversion of un-metered services to metered services
- Assist land use agencies in establishing new building standards to achieve water demand reductions.

## Chapter 4 Existing Sources of Water

### 4.1 Introduction

This section describes the sources of water available, a description of each water source, source limitations, water quality, water exchange and transfer opportunities, desalination, and reclaimed water. A discussion of surface water, groundwater, recycled water, desalinated water, stormwater, and any other source of water that is part of the Agency's water supply is included. Information regarding planned future water supplies projects and wholesale water supplies received from another source is also included.

### 4.2 Surface Water

Surface water accounts for approximately ninety-seven percent of the Agency's total water supply. Surface water is the sole supply source for both the Amador Water System (AWS) and the Central Amador Water Project (CAWP) and is obtained from the Mokelumne River watershed.

The Mokelumne River watershed is located on the Agency's southern boundary with the headwaters in parts of Amador, Alpine and Calaveras 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

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, Lake 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 in stream requirements.

The Agency 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.

#### 4.2.1 Amador Water System

In 1985, the Agency acquired the AWS from Pacific Gas and Electric (PG&E) and the contractual right to not more than 15,000 acre-foot per year (AFY) at a rate not to exceed 30 cubic feet per second (cfs). PG&E had been the major owner and operator for the purveyance of water in western Amador County since 1908.

#### 4.2.2 Central Amador Water Project

In 1978, the Agency entered into an agreement with PG&E for the use of PG&E facilities to store and divert water under water rights acquired by the Agency for the CAWP water system. CAWP is a wholesale system in which water districts in the community areas continue to own and operate their own distribution systems. CAWP pumps water from the Mokelumne River at PG&E's Tiger Creek Afterbay. The CAWP surface water diversion is limited to a firm yield of 1,150 AFY. The Agency is currently working to obtain additional surface water rights for the CAWP system which would expand the surface water diversions to 2,200 AFY.

## 4.3 Groundwater

Groundwater accounts for approximately three percent of the Agency's total supply and is only used in the communities of La Mel Heights and Lake Camanche Village.

### 4.3.1 La Mel Heights Water System

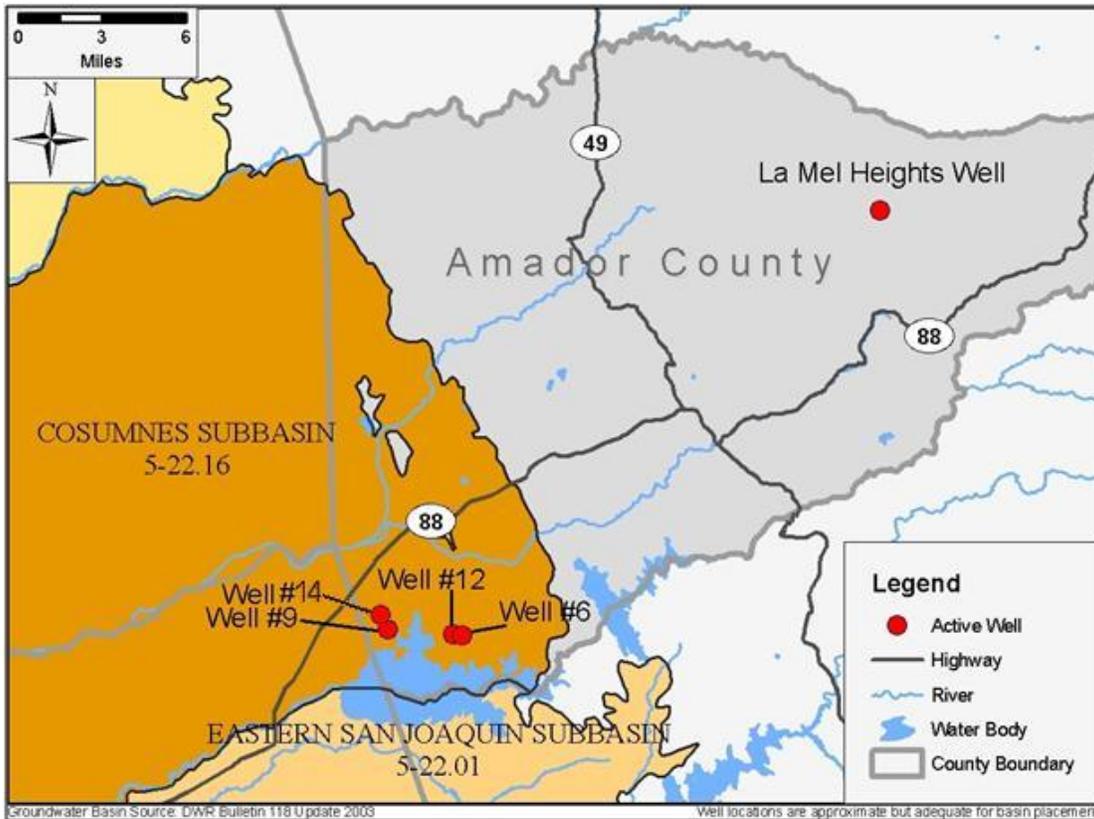
The Agency operates one well in the La Mel Heights area. The well pumps water from a groundwater aquifer that is not defined in Bulletin 118 published by the California Department of Water Resources (DWR). The well has a safe yield of 50 AFY, or 31 gpm. The old well has been retained as a back-up source.

### 4.3.2 Lake Camanche Village Area Water System

The Agency operates four wells in the Lake Camanche Village area. Well 6 has produces 161 AFY (100 gpm), Well 9 produces 500 AFY (310 gpm), Well 12 produces 145 AFY (90 gpm), and Well 14 produces 500 AFY (350 gpm). These wells pump water from the Cosumnes subbasin (subbasin 5-22.16) portion of the San Joaquin Valley Groundwater Basin (DWR Bulletin 188-80, California's Groundwater) as seen in Figure 4-1. This subbasin is not adjudicated. Well 14 experienced elevated turbidity and odor levels, and was not operated from September 2010 until July 2011. Well 14 is currently operating at reduced production levels pending the outcome of testing and redevelopment.

The Agency is currently in the process of preparing a Water Supply Sustainability Study for the Lake Camanche area, with grant assistance from the California Department of Water Resources, to study safe yields and potential management methods to improve use of the basin, which is expected to be completed in 2012. This Study is a precursor to preparation of a Groundwater Management Plan, which is planned for preparation in 2013.

Figure 4-1 Map of Cosumnes Subbasin and Amador Water Agency Wells



**4.3.3 Quantity, Location and Sufficiency**

The Cosumnes Subbasin (5-22.16) is approximately 439 square miles. It is bounded on the north and west by the Cosumnes River, on the east by the bedrock of the Sierra Nevada Mountains, and on the south by the Mokelumne River. Table 4-1 summarizes the rise and fall of the groundwater levels to the extent that data is available. The groundwater storage capacity is estimated to be about 6,000,000 acre-feet (AF) with an average specific yield of 7.4%. Basin inflows are estimated to be about 269,500 AFY. Water leaves the subbasin through subsurface flow (144,600 AFY), urban extraction (35,000 AFY), and agricultural extraction (94,200 AFY).

**Table 4-1 Historic Groundwater Levels in Cosumnes Subbasin**

Time Period	Change in Level	Change from Reference Level <sup>a</sup>
Mid-1960s	0	0
Mid-1960s - 1980	-20 to -30 feet	-20 to -30 feet
1980-1986	5 to 10 feet	-10 to -25 feet
1987-1992	-10 to -15 feet	-20 to -40 feet
1993-2000	15 to 20 feet	-5 to -20

Footnotes:

a. Reference level is taken to be the groundwater level during the mid-1960s.

Source: California’s Groundwater Bulletin 118 Updated 2003

Because of growth in the area and concerns with groundwater quality and quantity, the Lake Camanche Village area desires to phase out the use of groundwater. There are currently conceptual discussions of a joint surface water treatment plant project between East Bay Municipal Utility District (EBMUD), Calaveras County Water District and the Agency. This project is still in the planning stages and the surface water rights have not yet been identified.

The La Mel Heights area is limited on growth such that build out will be achieved in the next ten years. Therefore, the amount of groundwater projected to be pumped is held constant after the year 2020. To help meet the water demand in La Mel Heights, the Agency recently constructed a new well which has a yearly yield of 50 AFY. The old well has been retained as a back-up source.

**Table 4-2 Amount of Groundwater Pumped<sup>a</sup> (AF)**

Basin Name	2006	2007	2008	2009	2010
San Joaquin Valley Cosumnes Basin 5-22.16 (Lake Camanche Village wells)	314	262	300	292	280
Unclassified Groundwater Aquifer (La Mel Heights well)	18.7	20.3	20.0	15.7	16.3
% of Total Supply	3.5%	3.1%	3.6%	3.5%	3.5%

Footnotes:

- a. Amount of groundwater pumped from the Agency's annual reports to California Department of Health Services (DHS) for ID #3 and ID #7 Water Treatment Systems.

**Table 4-3 Amount of Groundwater Projected to be Pumped (AFY)**

Basin Name	2010	2015	2020	2025	2030
San Joaquin Valley Cosumnes Basin 5-22.16 (Lake Camanche Village wells)	280	338	396	455	513
Unclassified Groundwater Aquifer (La Mel Heights well) <sup>a</sup>	16.3	19.7	22.7	22.7	22.7
% of Total Supply	3.5%	3.6%	3.7%	3.9%	4.0%

Footnotes:

- a. La Mel Heights area assumed to be built out by 2020.
- b. 149 gallons of water delivered per capita per day was used (2010 actual delivery per capita)

## 4.4 Exchange or Transfer Opportunities

Currently, water demand in the AWS service area is below the Agency's surface diversions rights of 15,000 AFY. Recently, the construction of the Amador Transmission Pipeline was completed which reduced losses in the Amador Canal, which in turn has allowed surface water in excess of the AWS demand to remain in Mokelumne River and thus be incidentally captured in EBMUD's reservoirs. EBMUD participated in the funding of the pipeline but was not guaranteed a specific quantity of water. As water demand in the AWS service area increases with time, this incidental transfer will be reduced.

The Agency is not pursuing any other water transfers or exchanges at this time. The Agency would consider any future opportunities for short term and/or long-term water transfers and/or exchanges with other public agencies if both agencies would benefit from such an agreement.

## 4.5 Desalinated Water

Desalination is not considered to be a viable water supply option at this time for Amador Water Agency. The San Francisco Bay is about 70 miles from the boundary of Amador County. While the Bay Delta does extend toward the County, there is no forecasted need for an additional water supply that would financially justify the required transmission and desalination facilities. Currently, the groundwater salinity is low enough to not require any desalination. Should a need for additional water supplies be forecasted, desalination could be considered one of the potential long-term solutions.

## 4.6 Reclaimed Water

The Agency recognizes the benefit of recycled water to both reduce raw and potable water demands as well as providing a means of wastewater effluent disposal. Therefore, the Agency is currently preparing a Regional Approach for Water Reuse Project which proposes to maximize water recycling by developing a regional recycled water supply in lieu of raw and potable water. This project is being funded by a Proposition 84 grant through Sierra Nevada Conservancy and will be coordinated with local wastewater and planning agencies that have been identified as potential partners in the region. Additionally, multiple non-governmental agencies, organizations and interested parties have been identified to participate in future stakeholder workshops on the project. The project is anticipated to be complete in March 2013.

In 2005, the Agency prepared the Amador County Regional Wastewater Management Plan. This plan described the complex nature of wastewater treatment and disposal in the County while providing recommendations to the communities involved on the most effective way to incorporate expected growth in wastewater generation intelligently and economically. The Plan attempted to provide an overall roadmap for the County to respond to current and future service demands, technology trends, and regulatory

requirements. It is anticipated that the new Regional Approach for Water Reuse Project will supersede and replace the 2005 study.

#### 4.6.1 Wastewater Systems

Although the Agency currently owns, operates and maintains ten geographically separate wastewater treatment plants throughout Amador County, none of the systems currently recycle water to reduce raw or potable water demands. Eight of the ten systems are community leachfield systems, while the other two systems treat wastewater to a secondary level that is then applied to land for disposal. These systems produce such limited quantities of wastewater or are so removed from reuse opportunities as to make recycling both inefficient and cost prohibitive.

However, the Agency currently collects, but does not treat, a significant quantity of wastewater in the Martell area of Amador County which is immediately adjacent to two other wastewater treatment purveyors and is the area of consideration for the Regional Approach for Water Reuse Project.

**Table 4-4 2010 Agency Wastewater Collection and Treatment Systems**

WW System Name	Collection Type <sup>a</sup>	Collection Piping (feet)	Treatment Type <sup>b</sup>	Treatment Volume (AF)	Disposal Method <sup>c</sup>
Eagles Nest	Effluent, Gravity	6,423	CLS	3.84	Subsurface
Fairway Pines	Effluent, Gravity	22,984 <sup>d</sup>	CLS	6.22	Subsurface
Gayla Manor	Effluent, Gravity	7,725	Secondary	11.72	Subsurface & Spray
Jackson Pines	Effluent, Gravity	16,331	CLS	10.31	Subsurface
Lake Camanche	Conventional, Gravity	40,755	Secondary	58.28	Spray
Mace Meadows	Effluent, Gravity	22,984 <sup>d</sup>	CLS	12.54	Subsurface
Martell	Conventional, Gravity	81,276	N/A	N/A	N/A <sup>e</sup>
Pine Grove	Effluent, Pressurized	18,264	CLS	12.25	Subsurface
Surrey Junction	Effluent, Gravity	3,049	CLS	1.07	Subsurface
Tiger Creek Estates	Effluent, Gravity	2,778	CLS	0.25	Subsurface
Viewpoint	Effluent, Gravity	1,834	CLS	0.37	Subsurface
Wildwood Estates	Effluent, Gravity	5,802	CLS	4.24	Subsurface

Footnotes:

- a. Effluent=Septic Tank effluent, Conventional=Mixed liquor effluent, Gravity=Traditional gravity collection mains, laterals, manholes and lift stations; Pressurized=Pressurized collection mains and laterals without any lift stations.
- b. CLS=Community Leachfield System; Secondary=Secondary Level Treatment for Land Disposal.

- c. Subsurface=Disposal of effluent to leachfield trenches, Spray=Disposal of effluent to above ground spray fields
- d. Mace Meadows and Fairway Pines CLS share a common collection system.
- e. Disposal of wastewater collected in the Martell is under contract with the City of Sutter Creek for treatment.

**Table 4-5 Agency Wastewater Collection and Treatment Volumes (AF)**

	2010	2015	2020	2025	2030
WW Collected	172.25	180.14	187.82	197.43	207.90
WW Treated <sup>a</sup>	119.95	123.07	126.68	130.58	134.81
Recycled WW	0	0	0	0	0

Footnotes:

- a. WW Treated is less than WW Collected because disposal of wastewater collected in the Martell is under contract with the City of Sutter Creek for treatment.

In addition to the wastewater systems owned, operated and maintained by the Agency, there are numerous other wastewater purveyors within the Agency Service Area.

**Table 4-6 Non-Agency Wastewater Collection and Treatment Systems**

WW System Name	Collection Type <sup>a</sup>	Treatment Type <sup>b</sup>	Treatment Volume (MG)	Disposal Method <sup>c</sup>
City of Amador City	Conventional, Gravity	Primary		N/A <sup>d</sup>
City of Ione	Conventional, Gravity	Tertiary		Reclaimed
City of Jackson	Conventional, Gravity	Secondary		NPDES
City of Plymouth	Conventional, Gravity	Secondary		Spray

Footnotes:

- a. Conventional=Mixed liquor effluent, Gravity=Traditional gravity collection mains, laterals, manholes and lift stations.
- b. Primary=Primary Level Treatment; Secondary=Secondary Level Treatment for Land Disposal; Tertiary=Tertiary Level of Treatment for Land Disposal
- c. Spray=Disposal of effluent to above ground spray fields; NPDES=Disposal to surface water via an NPDES permit; Reclaimed=Disposal of effluent via permitted reclaimed water uses
- d. Disposal of wastewater collected from Amador City is under contract with the City of Sutter Creek.

#### 4.6.2 Existing Recycled Water

Currently, the only treated wastewater that meets recycled water standards within the Agency's service area is collected and treated by the City of Ione. This recycled water is then applied to the Castle Oaks Golf Course for irrigation.

#### 4.6.3 Potential Recycled Water Use

Currently, the Agency does not produce any recycled or reclaimed water at any of its wastewater treatment plants due to economic and technical feasibility issues. However, in the future, the Agency anticipates development of a regional reclaimed water supply to offset raw and potable water demands. It is anticipated

that wherever economically and physically feasible and when such recycled water is of adequate quality and quantity, the Agency and its partners will endeavor to plan, collaborate and implement the use of recycled water.

Uses may include, but are not limited to, agricultural irrigation, commercial landscape irrigation, residential or multi-family dual plumbed landscape irrigation, construction water, industrial process water, and recreational impoundments.

The development of the Regional Approach for Water Reuse Project is seen as the first step in implementing a regional approach to water recycling. This plan and subsequent detailed studies will provide a roadmap for optimizing the use of recycled water in the Agency's service area. Once a technically and economically viable approach to regional water reuse is attained, the Agency anticipates that it and its partners will take actions to provide financial incentives and otherwise encourage the use of recycled water. Currently, the Agency has developed engineering standards for the installation of reclaimed water piping in new subdivisions where feasible, however the Agency Board has not adopted any ordinance mandating its implementation.

Anticipated areas of potential development and use of recycled water use in central Amador County are discussed below.

#### IONE AREA

Development in the greater Ione area is projected to result in a need to treat and dispose of approximately 4.3 mgd of municipal and State institutional wastewater through a combination of golf course irrigation, industrial reuse and crop irrigation overlying the Ione Valley groundwater aquifer.

#### AMADOR CITY/SUTTER CREEK/MARTELL AREA

Development in the greater Amador City/Sutter Creek/Martell area (i.e. the Amador Regional Sanitation Authority ('ARSA') service area) is projected to result in a need to treat and dispose of approximately 5.52 mgd of municipal wastewater. Potential uses for reclaimed water in this area would include the existing ARSA fodder crops, agricultural irrigation, landscape irrigation, golf courses, wildlife habitat enhancement, and industrial reuse.

#### JACKSON AREA

Development in the greater Jackson area is projected to result in a need to treat and dispose of approximately 2.42 mgd of municipal wastewater. Jackson reclaimed water could be utilized for agricultural irrigation, landscape irrigation, golf courses, wildlife habitat enhancement, and industrial reuse.

## 4.7 Summary of Current and Future Water Supplies

Table 4-7 summarizes the Agency's current and future water supplies. The future supplies are based on several assumptions. First, La Mel Heights will reach build out in 2020 and not require any additional water supply. Second, Lake Camanche Village will switch to surface water in the year 2015.

**Table 4-7 Current and Planned Water Supplies (AFY)**

Water Supply Sources	2010	2015	2020	2025	2030
Surface Water <sup>a</sup>	16150	17200	17200	17200	17200
Supplier Produced Groundwater	296	369	441	511	581
Recycled Water <sup>b</sup>	0	0	0	0	0
Incidental Transfer to EBMUD <sup>c</sup>	N/A	N/A	N/A	N/A	N/A
<b>TOTAL<sup>d</sup></b>	<b>16,446</b>	<b>17,569</b>	<b>17,642</b>	<b>17,711</b>	<b>17,781</b>

Footnotes:

- a. It is anticipated the Agency will obtain additional water rights in CAWP, increasing the right from 1,150 AFY to 2,200 AFY.
- b. Recycled water is not supplied by the Agency but is used in a small portion of the Agency's service area. Future supply does not include several potential uses that are currently being investigated.
- c. Quantities transferred to EBMUD are incidental and not guaranteed for any specific amount. They are therefore not projected.
- d. Total does not reflect amount of water incidentally transferred out of supply to EBMUD.

## 4.8 Future Water Projects

The Agency participated in the preparation of the Integrated Regional Water Management Plan ('IRWMP') that laid out the roadmap for improving regional water resource management. Some of the projects identified in the IRWMP provide direct benefit to the Agency's water supply.

Specifically, the Agency, Calaveras County Water District, East Bay Municipal Utility District and San Joaquin County are together investigating the feasibility of increasing storage at Lower Bear River Reservoir by raising Lower Bear River Dam to provide an additional firm water supply and improve dry year yield and thereby helping meet future water supply needs. Raising Lower Bear River Dam is being considered as part of the larger Mokelumne Inter-Regional Conjunctive Use Project (IRCUP). The IRCUP could use a combination of groundwater banking, exchanges and transfers among project partners to result in a sustainable improvement in water supply reliability. Raising Lower Bear River Dam would also increase power generation at existing downstream hydroelectric power plants and is currently being considered by Pacific Gas & Electric independently of IRCUP.

There are several other components of IRCUP, some of which are controversial and have been the targets of litigation. While there may be barriers to implementation of some of the components of IRCUP, the Agency believes that regional cooperation of competing interests holds the best opportunity for success.

Since the IRCUP is still in the planning stages, at this time there are no projected supply volumes available.

## Chapter 5 Water Supply Reliability & Contingency Planning

### 5.1 Introduction

The Agency regularly reviews and evaluates projected system demands versus available supplies in order to ensure a sufficient capacity within the Service Area. This chapter analyzes water supply and reliability under a wide variety of scenarios and its resultant effect on water demand management practices.

### 5.2 Reliability

Agency operational experience during normal, dry and multiple dry year conditions, such as 1988 to 1994, indicates that the spring runoff will continue to fill PG&E reservoirs to near capacity. These reservoirs form the head of both the AWS and CAWP surface water diversions. Even during unusually severe droughts, such as occurred in 1976/1977, and the prolonged drought of 1988 to 1994, the PG&E storage capacity and the priority of the water rights for such storage enables PG&E to deliver the full annual contract entitlements to the Agency.

The original La Mel Heights groundwater well has been run continuously through a variety of seasonal and climatic conditions and has continued to produce a steady yield. The Agency added a second well in the La Mel Heights area to provide additional supply as well as to provide redundancy.

The Agency is currently in process of a Groundwater Sustainability Study for the Lake Camanche Village service area, as directed by the State Department of Public Health (CDPH). The study is expected to be completed in Calendar Year 2012 and will allow the Agency to determine the number of connections that the groundwater basin can reliably supply. To date, the water Cosumnes Sub-basin that supplies Lake Camanche Village has supplied sufficient water, but it should be noted that the Agency did not receive ownership of the system until 2001, therefore supply data for dry and multiple dry years is not available.

### 5.3 Contingency Planning

#### 5.3.1 Catastrophic Supply Interruption Plan

In addition to drought, the Amador Water Agency has planned for other catastrophes that could impact water supply and quality. For example, in case of a short-term, regional power outage the Agency has purchased or has access to emergency generators to pump and treat water. The Buckhorn, Tanner, and Ione Water Treatment Plants have been assessed for possible water supply emergency scenarios and action plans have been developed. Table 5-1 summarizes the catastrophes for which the Agency has prepared in some or all of their facilities. Appendix J contains the Agency's Emergency Handbook.

Due to the Agency's geographic location and the areas seismic classification, service interruption due to seismic activity is considered minimal and is therefore not addressed in the Emergency Handbook. The only like issue arising out of a seismic event would be a potential power outage which is addressed within the Emergency Handbook.

**Table 5-1 Preparation Actions for a Catastrophe**

Possible Catastrophe	Check if Discussed
Computer/PLC Failure	X
Power Failure	X
Raw Water Quality / Loss of Raw Water Supply	X
Disinfection Failure	X
Treated Water Turbidity Spike	X
Fire	X
Chemical Spill/Leak	X
Maximum Contaminant Level (MCL) Failure	X
Loss of Pressure	X

### 5.3.2 Consumption Reduction Methods & Mandatory Prohibitions

This section describes the program elements in place to reduce water use and eliminate waste when necessary and the penalties which exist to enforce the restrictions. Also see Appendix H for the existing Agency Code/Ordinance.

Table 5-2 details the restrictions that shall take effect should the Agency Board of Directors declare a water shortage emergency (Stage 2).

**Table 5-2 Water Shortage Contingency - Mandatory Prohibitions**

Examples of Prohibitions	Stage When Penalty Takes Effect
Irrigation between 9am and 7pm.	2
Washing of vehicles by a hose without an automatic shut-off valve or by use of water directly from faucets or other outlets.	2
Emptying and refilling of swimming pools and hot tubs.	2
Washing of sidewalks, walkways, driveways, patios, parking lots, tennis courts or other hard-surfaced areas by hose or by use of water directly from faucets or other outlets.	2
Operation of decorative fountains.	2
Sewer flushing with fresh water.	2
Irrigation that results in flooding or other run-off.	2
Unattended watering.	2
The use of water for scenic and recreational ponds and lakes, except for the minimum amount required to support fish life.	2

The Agency water shortage contingency plan also identifies several methods to reduce consumption of potable water. During a Stage 2 water emergency, these methods are considered to be mandatory. The amount of reduction required by each user is determined by the Board of Directors at the time of the declaration. The reduction methods include:

- Use of water conservation kits which may include a device to reduce toilet flush water requirements, a device to reduce shower flow rates, a dye tablet to determine if a toilet tank leaks, or other devices or information pertinent to water conservation.
- Applications for service connections for new construction shall be granted upon condition that water shall be used for only interior purposes for the duration of the drought or emergency.
- Restaurants shall serve water to customers only upon request.
- Industrial water uses shall be reduced to the lowest possible amount that will allow continued operation.

The Agency depends heavily on voluntary adherence to drought imposed restrictions. However, in the event that voluntary compliance is ignored during a Stage 2 emergency, penalties are included in the Water Shortage Contingency Plan. The penalties and charges are as follows:

- First Offense: Written warning from the Agency but no change in service.
- Second Offense: A flow restriction device is installed for a period of one week. The customer is responsible for paying a penalty for removal of the device.

Third and Subsequent Offense(s): A flow restriction device is installed for the duration of the state of emergency. The customer is responsible for paying a penalty for removal of the device.

Table 5-3 summarizes the consumption reduction methods.

**Table 5-3 Consumption Reduction Methods**

Consumption Reduction Method	Stage When Method Takes Effect	Projected Reduction (%) <sup>a</sup>
Enforcement of Prohibited Measures (outdoor water use restrictions, etc.)	2	31% <sup>b</sup>
Water conservation kits	2	8% <sup>c</sup>
New construction restrictions on outdoor water use	2	n/a <sup>d</sup>
Service of water in restaurants	2	0.5%
Reduction of volume of water used by industry	2	11%
Total Projected Reduction	---	50.5%

Footnotes:

- Percent reductions are best estimates and have not been verified during a Stage 2 emergency. Estimates were based on Water Use and High Population Estimate in 2010.
- Estimated based on reducing water use in each sector as follows: SFR-35%, MFR, Commercial, Institutional- 10%, Industrial- 5%, Landscape- 90%.
- Estimated based on low-flow shower heads providing water savings of 5 gal/person/day.
- Reductions based on construction restrictions depend upon the number of new meters being constructed during a Stage 2 water emergency.

### 5.3.3 Water Supply Shortage Stages

**Table 5-4 Water Shortage Contingency - Rationing Stages to Address Water Supply Shortages**

Stage Number	Supply Shortage Condition	Customer Demand Reduction Goal	Type of Conservation Program
1	None	0%	Normal
2	Drought or Water Emergency	0.5% to 50.5%	Mandatory

### 5.3.4 Penalties

In order to address waste of Agency water (running to a gutter, pooling, or running off of applied areas), the Agency has established penalties. After two warnings by mail or personal service to the customer, the Agency may disconnect the service for failure to comply. The disconnected service will be restored only upon correction of the water waste condition and payment of the Service Call Fee set forth in the Agency Rate Schedule. Water wasted will be estimated and charged for in accordance with the Agency's Water Service Rates and Charges. Table 5-5 summarizes the penalties and charges.

**Table 5-5 Penalties and Charges**

Penalties and Charges	Stage When Penalty Takes Effect
Charge for excess use <sup>a</sup>	1 & 2
Penalty for excess use	2
Flow restriction	2
Written warning	2
Service disconnection	2

Footnote:

- a. The Agency uses tiered rate structure for some parts of its system at all times.

### 5.3.5 Revenue & Expenditure Analysis

Due to the reliable availability of water, even during long and severe droughts, revenue impacts to the Agency due to reduced water sales are minimal. The Agency does not maintain funding reserves for water shortages due to sufficient funds available to the Agency and the infrequent occurrence and short duration of Stage 2 emergencies. A significant portion of personnel costs are recovered through service. Wasted water is still metered and is not considered to be lost revenue. Water supply conditions that would reduce sales, would generally be considered part of the cost of maintenance. In the cases of anthropogenic impacts to water quality or man-made or natural disasters, it is anticipated that lost revenue could be recovered or absorbed due to the emergency situation.

## 5.4 Water Quality Impacts to Reliability

### 5.4.1 Surface Water – Amador Water System & Central Amador Water Project

The Mokelumne River, which is the source water for AWS and CAWP, is a high quality of source water for most of the year. During storm periods, the water quality becomes somewhat turbid but this has not caused changes in the availability of the water supply to either system.

#### 5.4.2 Groundwater – Lake Camanche Village and La Mel Heights

For the groundwater sources, water quality is of moderate concern. There are six wells in the Lake Camanche Village area. Two of the wells were closed due to water quality concerns. These two wells are currently not used. No historical records are available to determine the extent of water quality issues at the two discontinued wells. Wells 9 and 14 have experienced some problems with water quality, particularly bacteria while Well 12 has occasionally had issues with iron and manganese, although recent change of operations of this well have seemed to eliminate this problem over the last few years. According to the Year 2010 well pumping records for Lake Camanche Village, approximately 13 percent of the supply is from Well 6, 41 percent of the supply is from Well 9, 25 percent of the supply is from Well 12 and 21 percent of the supply is from each Well 14. Wells 9 and 14 are located on the west side of Lake Camanche, while Wells 6 and 12 are both located east of the lake.

Well 14 was offline due to water quality issues from September 2010 until July 2011, however the remaining three wells have so far met the demands of Lake Camanche Village. Currently, Well 14 is operating at a reduced production rate and a plan has been developed to rehabilitate Well 14, but is pending approval of a rate increase to provide the revenue needed to implement the plan. The Agency will continue to monitor the safe yield and water quality of the wells as the Camanche Water Sustainability Study is completed and anticipates the return of Well 14 to production.

The groundwater from the La Mel Heights area well is of adequate quality and is not considered subject to changes in supply due to water quality concerns.

### 5.5 Seasonal and Climatic Shortage

During the recent extreme drought of 1976/1977 and prolonged drought of 1988 to 1994, spring runoff each year managed to fill PG&E's reservoirs to near capacity. By July, runoff is typically near zero and system water demands are met by storage facilities. The timing of the runoff is about the same for wet or dry years with the only difference being the magnitude of the runoff and the amount of reservoir spill. PG&E is able to provide the full annual water contract entitlements to the Agency due to the priority of the water rights involved and the amount of water stored on behalf of the Agency. Therefore, the supply available for normal, dry or multiple dry year scenarios remains the same for surface water diversions.

For the limited groundwater sources utilized by the Agency, the firm yield determined at the time of well installation indicates that the supply is consistent for normal, dry or multiple dry years. Climatic change is not considered to be a factor in the Agency's water supply reliability.

For planning purposes, the Agency assumes that demands do not change from the normal year demands during single or multiple dry year scenarios. Projected normal year demands are based on estimated customer connections and projected unit water demands to comply with 20% by 2020 requirements.

#### 5.5.1 Water Supply

Table 5-6 summarizes the projected current water supply which is based on water rights, not demands. Note that it is anticipated the Agency will obtain additional water rights in CAWP, increasing the right from 1,150 AFY to 2,200 AFY by 2015.

Groundwater production is not included in the calculations, but rather safe yields of the respective wells are utilized. The Agency does not expect to encounter recurring water quality issues with its Lake Camanche Village wells, however the projections assume only Wells 6, 9 and 12 are on-line, and that a surface water treatment facility is not operational.

Finally, the table does not cover mechanical failures that may be experienced by the Agency, such as failure of the Tiger Creek and Silver Lake Pines Pump Stations for CAWP and well pumps for the La Mel and

Lake Camanche Village systems. The CAWP pump stations are greater than 30 years old and under capacity for current demands.

**Table 5-6 Projected Normal Water Supply<sup>a</sup> (AFY)**

Supply	Average Year	Dry Year	Multiple Dry Years		
			2011	2012	2013
AWS Surface Water Diversions	15,000	15,000	15,000	15,000	15,000
CAWP Surface Water Diversions <sup>a</sup>	1,150	1,150	1,150	1,150	1,150
La Mel Heights Groundwater	25	25	25	25	25
Lake Camanche Village Groundwater <sup>b</sup>	325	244	244	244	244
Total	16,500	16,419	16,419	16,419	16,419
% of Projected Normal Supply	100%	99.5%	99.5%	99.5%	99.5%

Footnotes:

- It is anticipated that the Agency will obtain 1,050 AFY additional water rights in CAWP.
- These water supply changes assume a loss of 25% production during the dry years.

### 5.5.2 Demand

Current groundwater production is estimated at 350 AFY, and does not include Well #14 in Lake Camanche Village. Supply in 2010 is 16,500 AFY. Additional customers are included for La Mel and Lake Camanche Village in 2015, 2020, 2025, and 2030. Should Camanche Groundwater Sustainability Study indicate the aquifer cannot support the additional connections anticipated by Amador County, either the additional connections would not be permitted or a new surface water treatment plant would be required. The calculations assume that additional water supply sources, either wells or new surface water treatment plant, will be on-line to accommodate the additional planned growth in the Lake Camanche Village area. It is anticipated that the Agency will obtain 1,050 AFY additional water rights in CAWP.

#### Normal Year

Table 5-7 compares the supply and demand during a normal year.

**Table 5-7 Supply and Demand Comparison - Normal Year (AFY)**

Demand	2010	2015	2020	2025	2030
Supply Totals	16,446	17,669	17,742	17,811	17,881
Demand Totals	8,407	9,052	9,778	10,594	11,446
Difference	8,039	8,617	7,963	7,217	6,435
Difference as % of Supply	49%	49%	45%	41%	36%
Difference as % of Demand	96%	95%	81%	68%	56%

**Single Dry Year**

Table 5-8 compares the supply and demand during a dry year.

**Table 5-8 Supply and Demand Comparison – Single Dry Year (AFY)**

	2010	2015	2020	2025	2030
Supply Totals	16,446	17,581	17,635	17,687	17,740
Demand Totals	8,407	8,964	9,672	10,470	11,305
Difference	8,039	8,617	7,963	7,217	6,434
Difference as % of Supply	49%	49%	45%	41%	36%
Difference as % of Demand	96%	96%	82%	69%	57%

**Multiple Dry Years**

Table 5-9 compares the supply and demand during multiple dry years.

**Table 5-9 Supply and Demand Comparison – Multiple Dry Years (AFY)**

	Supply	2010	2015	2020	2025	2030
Multiple Dry Years, First Year Supply	Supply Totals	16,446	17,581	17,635	17,687	17,740
	Demand Totals	8,407	8,964	9,672	10,470	11,305
	Difference	8,039	8,617	7,963	7,217	6,434
	Difference as % of Supply	49%	49%	45%	41%	36%
	Difference as % of Demand	96%	96%	82%	69%	57%
Multiple Dry Years, Second Year Supply	Supply Totals	16,446	17,581	17,635	17,687	17,740
	Demand Totals	8,407	8,964	9,672	10,470	11,305
	Difference	8,039	8,617	7,963	7,217	6,434
	Difference as % of Supply	49%	49%	45%	41%	36%
	Difference as % of Demand	96%	96%	82%	69%	57%
Multiple Dry Years, Third	Supply Totals	16,446	17,581	17,635	17,687	17,740
	Demand Totals	8,407	8,964	9,672	10,470	11,305
	Difference	8,039	8,617	7,963	7,217	6,434

	Supply	2010	2015	2020	2025	2030
Year Supply	Difference as % of Supply	49%	49%	45%	41%	36%
	Difference as % of Demand	96%	96%	82%	69%	57%

## 5.6 Use Reduction Monitoring

Appendix H contains the Agency's Water Shortage Contingency Plan, Sections 2.19 and 2.20 of the Agency's water code.

Water use during normal, wet, and dry periods is monitored by several means. Meters are installed on all new connections to an Agency water system and on all existing connections upon the occasion of a change of customer at the subject premises. Flat rate services are being phased out. Currently only about 200 of approximately 6,600 customers are not fully metered. Records are kept of both water production and consumption. These records are maintained and analyzed to identify losses in the system and to establish baselines in case of a declaration of emergency. In case of an emergency, achievement of reductions is determined by the Agency through comparison of the customer's prior year's seasonal usage with the seasonal usage during the year of the drought or other emergency. If the drought is severe enough, the Board can order monitoring of water production and uses on a weekly or even daily basis. The high, and growing, percentage of metered customers within the service area facilitates this effort. Table 5-10 summarizes the water use monitoring mechanisms.

**Table 5-10 Water Use Monitoring Mechanisms**

Mechanism for Determining Actual Reductions	Type of Data Expected
Comparison of production/billing records	Acre feet increase/decrease

## Chapter 6 Demand Management Measures – Section 10631 (f)

### CONSERVATION PROGRAMS

The Agency is committed to ensuring the implementation of water conservation programs that will promote efficient use of the existing water supplies. This section discusses existing and future water conservation measures, referred to interchangeably as Best Management Practices (BMPs) or Demand Management Measures (DMMs), being implemented by the Agency.

The Agency prepared an Urban Water Management Plan in 2005. The Agency adopted a Water Conservation Plan ('WCP') in 2010. The UWMP discussed fourteen potential conservation programs, referred to as DMMs. The California Urban Water Conservation Council ('CUWCC') adopted the 1991 *Memorandum of Understanding Regarding Urban Water Conservation in California* ('MOU'), outlining the same fourteen conservation programs (but calling them BMPs) to expedite implementation of reasonable water conservation measures in urban areas. The CUWCC MOU has since been amended in December of 2008. During this amendment, the BMPs were restructured into new BMP categories. This document references the original fourteen DMMs/BMPs to the extent possible in order to be consistent with the AB1420 legislation and reporting requirements.

Each of the fourteen DMMs documented in the UWMP guidelines and the AB1420 certification documents is discussed below. For each DMM, the description of the DMM, the goal for full compliance and compliance documentation required as set forth in the CUWMM MOU is presented. The CUWCC MOU requirements were used herein as measures for Agency compliance as the AB1420 legislation uses this document as its measure for State-wide compliance with the legislation.

Due to limited available funds, the Agency cannot meet the CUWCC goal for some of the DMMs within the specified period, but plans to implement each DMM to the level fiscally possible, as described in this Conservation Plan. If the Agency obtains outside funding, the conservation programs will be expanded and/or accelerated until the coverage requirements specified in the CUWCC MOU have been met. Appendix A contains the comprehensive plan that would be implemented if full funding were available and demonstrates how the programs would be expanded, given outside funding, to meet the goals set forth in the CUWCC's MOU.

## 6.1 Demand Management Measure 1

### 6.1.1 CUWCC Description

This DMM is intended to provide water survey programs for both single-family and multi-family residential customers. Survey programs are to encompass both indoor and outdoor water use. Specifically, DMM 1 is to include the following.

Residential Assistance - Provide site-specific leak detection assistance that may include, but is not limited to a water conservation survey, water efficiency suggestions, and/or inspection.

Landscape Water Survey - Perform site-specific landscape water surveys that shall include, but are not limited to, the following: check irrigation system and timers for maintenance and repairs needed; estimate or measure landscaped area; develop customer irrigation schedule based on precipitation rate, local climate, irrigation system performance, and landscape conditions; review the scheduling with customer; provide information packet to customer; and provide customer with evaluation results and water savings recommendations.

### 6.1.2 CUWCC Documentation Requirement

Provide reports, disaggregated by single-family and multi-family units, identifying the number of:

- Residential assistance/leak detection survey visits completed,
- WaterSense Specification (WSS) showerheads distributed, and
- WSS faucet aerators distributed during the reporting period.

In addition, provide the number of single-family and multi-family account landscape water surveys completed during the reporting period.

### 6.1.3 CUWCC Goal

Provide leak detection assistance averaging 1.5% per year of single-family accounts and 1.5% of multi-family accounts per year for the first ten years. After meeting the 10 year 15% target, maintain the program at level of high-bill complaints or not less than 0.75% per year of current single-family accounts and 0.75% per year of current multi-family accounts. The same level of compliance will be provided for landscape surveys.

### 6.1.4 Implementation Status

The Agency is currently implementing this program, but has not yet achieved the CUWCC goal.

### 6.1.5 Existing AWA Program

Water surveys for residential users help raise awareness of water conservation in the home and water-saving kits conserve water during everyday use. In the past, the Agency has offered free residential water use surveys and water saving kits to customers upon request. The Agency has also provided landscape surveys when requested, including sprinkler system efficiency, distribution uniformity, seasonal scheduling and repairs or improvements. The Agency has had an informal water survey program since 1985, but has not tracked the number of surveys performed annually.

### 6.1.6 Future AWA Program

Herein, the Agency has formalized its program for residential water surveys, landscape water surveys, and WSS showerhead and faucet aerator distribution. Table 6-1 summarizes the estimated number of surveys to be completed over the next five years. These surveys include both indoor and outdoor investigations and suggestions for both single-family and multi-family residences. The numbers included in Table 6-1 assume residential landscape surveys will be conducted at the same time as indoor residential surveys.

**Table 6-1: Projected Water Survey Program**

	<i>FY12</i>	<i>FY13</i>	<i>FY14</i>	<i>FY15</i>	<i>FY16</i>
# of single-family surveys	50	100	100	100	100
# of multi-family surveys	1	1	2	3	4
# of landscape surveys	50	100	100	100	100

Note: In FY11, the Agency will perform 10 single-family surveys, 1 multi-family survey, and 10 landscape surveys.

## 6.2 Demand Management Measure 2

### 6.2.1 CUWCC Description

Provide site-specific leak detection to residential customers by providing plumbing retrofits, including showerheads and faucet-aerators that meet the current water efficiency standard as stipulated in the WaterSense Specifications (WSS).

### 6.2.2 CUWCC Documentation Requirement

Provide reports, disaggregated by single-family and multi-family units, identifying: the number of residential assistance/leak detection survey visits completed; number of WSS showerheads distributed; and number of WSS faucet aerators distributed during the reporting period.

### 6.2.3 CUWCC Goal

Plumbing device distribution and installation programs will be maintained at a level sufficient to distribute high quality, low-flow showerheads to not less than 10% of single-family residences and 10% of multi-family units constructed prior to 1992 each reporting period; or enactment of an enforceable ordinance requiring the replacement of high-flow showerheads and other use fixtures with their low-flow counterparts. Continue until coverage includes 75% of single family and multi-family units.

### 6.2.4 AWA Status

The Agency has not yet implemented this DMM.

### 6.2.5 Existing AWA Program

The Agency encourages its customers to conserve water during everyday use, but has not yet implemented a formal program to provide plumbing retrofits to users.

### 6.2.6 Future AWA Program

Implementation of this DMM will be combined with DMM 8, school education. As part of the school education programs discussed in DMM 8, the Agency will distribute low-flow showerheads to the fifth-grade classes targeted for presentations each year. Under this program, the Agency will distribute approximately 300 WSS showerheads each year. To evaluate the effectiveness of the school education program, the Agency will track the number of phone calls from parents/guardians requesting more information on conservation programs and/or the low-flow showerheads after the fifth-grade programs are held. The Agency may also compare water use at homes before and after the distribution of the WSS showerheads and other water saving devices. The number of showerheads distributed can be adjusted as necessary.

In addition to providing low-flow showerheads to the 5<sup>th</sup> grade classes under DMM 8, the Agency will either distribute additional low-flow showerheads as giveaways at other public events and/or provide a predetermined number of rebates for low-flow showerheads each year. The latter is assumed for purposes of future planning. Table 6-2 summarizes the total number of planned low-flow showerhead rebates provided for residential plumbing retrofits (in lieu of give-aways) each fiscal year.

**Table 6-2 Planned Residential Plumbing Retrofits**

	<i>FY12</i>	<i>FY13</i>	<i>FY14</i>	<i>FY15</i>	<i>FY16</i>
# showerhead rebates	195	389	389	389	389
AFY savings showerheads	2.7	5.4	5.4	5.4	5.4

Notes:

- Rebates for low-flow toilets will not be included in DMM 2, as DMM 14 is devoted solely to providing WSS Toilets.
- This DMM is not budgeted for in FY11.

## 6.3 Demand Management Measure 3

### 6.3.1 CUWCC Description

Per the CUWCC program, implementation of DMM 3 shall consist of at least the following actions:

1. Annually complete a pre-screening system audit to determine the need for a full-scale system-wide water audit. The pre-screening system audit shall be calculated as follows:
  - a. Determine metered sales;
  - b. Determine other system verifiable uses;
  - c. Determine total supply into the system;
  - d. Divide metered sales plus other verifiable uses by total supply into the system. If this quantity is less than 0.9, a full scale system audit is indicated.
2. When indicated, agencies shall complete water audits of their distribution systems using methodology consistent with that described in AWWA's Water Audit and Leak Detection Guidebook.
3. Agencies shall advise customers whenever it appears possible that leaks exist on the customer's side of the meter; perform distribution system leak detection when warranted and cost-effective; and repair leaks when found.

### 6.3.2 CUWCC Documentation Requirement

Documentation required in support of this DMM includes pre-screening audit results and supporting documentation, and in-house records of audit results or the completed AWWA Audit Worksheets for each completed audit period.

### 6.3.3 CUWCC Goal

Complete one pre-screening audit per year.

### 6.3.4 AWA Status

The Agency is currently implementing this program, but has not yet achieved the CUWCC goal.

### 6.3.5 Existing AWA Program

Repair and maintenance of the water distribution systems are priorities for the Agency and the Agency has conducted system water audits since its founding. On a small scale, the Agency contacts individual customers when meter readings indicate unusually high usage. The Agency will then work with the owner to determine if a leak may have developed. System audits are also performed on a larger scale.

Records are kept annually on water production versus consumption to track unaccounted water in the system. As previously described, the Agency installed the Amador Transmission Pipeline, replacing the earthen Amador and Ione Canal, ultimately reducing the system leaks and high water losses. The new pipeline mitigates for water historically lost during conveyance through the Amador Canal, lowering effective system demand and allowing the Agency to more efficiently use its water entitlements. Also, by eliminating canal losses, the Agency has been able to better identify residential, commercial and industrial losses.

### 6.3.6 Future AWA Program

As required by DMM 3, the Agency will conduct an annual pre-screening audit of their entire distribution system. If indicated by the pre-screening audit, a system-wide detailed water audit will be performed. For

the purposes of budgeting for this DMM, it was assumed that a detailed water audit will be conducted every five years.

There is potential for the Agency to coordinate a joint leak detection and pipe repair program with its southern neighbor, the Calaveras County Water District. This would be implemented through the regional umbrella organization, the Upper Mokelumne River Watershed Authority, and could potentially achieve cost savings through a shared program.

## 6.4 Demand Management Measure 4

### 6.4.1 CUWCC Description

Implementation of this DMM shall consist of at least the following actions:

1. Require meters for all new service connections.
2. Establish a program for retrofitting existing unmetered service connections.
3. Read meters and bill customers by volume of use.
  - Establish and maintain billing intervals that are no greater than bi-monthly (every two months) for all customers.
  - For each metered connection, perform at least five actual meter readings (including remotely sensed) per twelve month period.
4. Prepare a written plan, policy or program that includes:
  - A census of all meters, by size, type, year installed, customer class served and manufacturer's warranty accuracy when new;
  - A currently approved schedule of meter testing and repair, by size, type and customer class;
  - A currently approved schedule of meter replacement, by size, type, and customer class; and
5. Identify intra- and inter-agency disincentives or barriers to retrofitting mixed use commercial accounts with dedicated landscape meters, and conducting a feasibility study(s) to assess the merits of a program to provide incentives to switch mixed use accounts to dedicated landscape meters.

Service lines dedicated to fire suppression systems are exempt from this requirement.

### 6.4.2 CUWCC Documentation Requirement

Documentation required for compliance with the CUWCC MOU is as follows:

- Confirmation that all new service connections are metered and are being billed by volume of use and provide:
  - Number of metered accounts;
  - Number of metered accounts read;
  - Number of metered accounts billed by volume of use;
  - Frequency of billing (i.e. six or twelve times per year) by type of metered customer (e.g. single-family residential, multiple-family residential, commercial, industrial, and landscape irrigation); and
  - Number of estimated bills per year by type of metered customer (e.g. single-family residential, multiple-family residential, commercial, industrial, and landscape irrigation) vs. actual meter readings.

- Number of unmetered accounts in the service area. For the purposes of evaluation, this shall be defined as the baseline meter retrofit target, and shall be used to calculate the agency's minimum annual retrofit requirement.
- Number of unmetered service connections retrofitted during the reporting period.
- Estimated number of CII accounts with mixed-use meters.
- Number of CII accounts with mixed-use meters retrofitted with dedicated irrigation meters during reporting period.

### 6.4.3 CUWCC Goal

Meter 100% of existing unmetered accounts and bill by volume, including:

1. Initiating volumetric billing for all metered customers within one year.
2. Complete meter installation for all service connections within 6 years.
3. For unmetered service areas newly acquired or newly operated by otherwise metered agencies, meter installation shall be completed in these service areas within 6 years of the acquisition or operational agreement.
4. A feasibility study examining incentive programs to move landscape water uses on mixed-use meters to dedicated landscape meters to be completed by the end of Year Four.
5. A written plan, policy or program to test, repair and replace meters shall be completed and submitted electronically within one year.

### 6.4.4 AWA Status

The Agency is currently implementing this program, but has not yet achieved the CUWCC goal.

### 6.4.5 Existing AWA Program

The Agency's treated water systems are not fully metered. The Agency has historically converted services from flat rate to metered service upon transfer of ownership. There are still approximately 27 residential, commercial and raw customers requiring metering, and approximately 153 accounts yet to be converted from flat rate to volumetric billing. As these properties transfer ownership, they are required to convert to metered service. Meters are installed with every new connection made to an Agency water system, whether treated or untreated, at the time that the service connection is installed.

### 6.4.6 Future AWA Program

Table 6-3 summarizes the planned commodity rate metering and retrofits for the next five fiscal years.

**Table 6-3 Planned Commodity Rate Metering and Retrofits**

	<i>FY12</i>	<i>FY13</i>	<i>FY14</i>	<i>FY15</i>	<i>FY16</i>
# of meter conversions	20	0	0	0	0
# of accounts from flat to volumetric use	153	0	0	0	0

Note: In FY11, the Agency will convert 7 unmetered accounts to metered.

## 6.5 Demand Management Measure 5

### 6.5.1 CUWCC Description

Under DMM 5, the Agency will provide support and incentives to improve non-residential customers' landscape water use efficiency. Support shall include:

1. Accounts with dedicated irrigation meters:

- Identify accounts with dedicated meters and assign ETo-based water use budgets equal to no more than an average of 70% of ETo of annual average local ETo per square foot of landscape area.
  - Provide notices each billing cycle to accounts with water budget showing the relationship between the budget and actual consumption.
  - Offer site-specific technical assistance to reduce water use to accounts that are 20% over budget.
2. Commercial, industrial, and institutional (CII) accounts without meters or with mixed-use meters
    - Develop and implement strategy targeting large landscape water use surveys to CII accounts with mixed-use meters.
    - In un-metered service areas, actively market landscape surveys to existing accounts with large landscapes or accounts with landscapes that are not water efficient.
  3. Offer financial incentives.

### **6.5.2 CUWCC Documentation Requirement:**

Under this DMM, the Agency shall preserve water use records and budgets for customers with dedicated landscape irrigation accounts for at least four years. In addition, the following information will be preserved for CII accounts without meters or with mixed-use meters:

- Number of accounts
- Number, type, dollar value of incentives, rebates, and no- or low-interest loans offered to, and received by, customers
- Number of surveys offered
- Number of surveys accepted
- Estimated annual water savings by customers receiving surveys and implementing

### **6.5.3 CUWCC Goal**

Per the CUWCC MOU (set by AB1420 as the standard for DMM compliance), the goals for DMM 5 are as follows:

- At least 90% of all dedicated meters and 15% of all mixed-use and non-metered accounts will receive assistance over a ten year period.
- Develop ETo-based water use budget for 9% of all dedicated accounts per year over 10 years.
- Offer site specific technical assistance annually to accounts that are 20% over their budget within 6 years of the date implementation was to commence.

### **6.5.4 AWA Status**

The Agency has not yet implemented this DMM.

### **6.5.5 Existing AWA Program**

The Agency has approximately 30 accounts dedicated solely to large landscape irrigation. These accounts are mostly local parks and cemeteries. The Agency has offered surveys to large landscape accounts, along with all commercial, industrial, and institutional accounts since 1985 as an informal service; however, as the service was informal, no historic records have been kept.

### **6.5.6 Future AWA Program**

The Agency will begin a program to formally offer surveys to large landscape accounts. Under this program, the Agency will visit customers who irrigate and recommend an efficient irrigation schedule and

improvements. The Agency will provide each dedicated irrigation account with an ETo-based water use budgets equal to no more than an average of 70% of ETo of annual average local ETo per square foot of landscape area. The recreational areas, like parks, may require additional water than allotted in the budget, but their use still may not exceed 100% of ETo on an annual basis. To aid the customer in tracking their water use, the Agency will provide notices each billing cycle to the accounts with water use budgets showing the relationship between the budget and their actual consumption. The Agency will offer technical assistance to customers that are 20% over budget. Surveys will also be provided to commercial, industrial and institutional accounts without meters or with mixed-use meters. Finally, the Agency will implement a weather based irrigation controller (WBIC) rebate program, offering \$50/WBIC.

Table 6-4 summarizes the projected number of the large landscape surveys and rebates to be offered to customers under this DMM. Also shown below is the projected water savings resulting from the program implementation.

**Table 6-4: Planned Large Landscape Conservation Programs**

	<i>FY12</i>	<i>FY13</i>	<i>FY14</i>	<i>FY15</i>	<i>FY16</i>
# of budgets created	2	3	3	3	3
# of surveys completed	4	6	6	6	6
# of follow-up visits	2	3	3	3	3
# of rebates	1	2	2	2	2
Projected Water Savings- AFY	3.9	5.3	5.3	5.3	5.3

Note: This DMM is not budgeted for in FY11.

## 6.6 Demand Management Measurement 6

### 6.6.1 CUWCC Description

DMM 6 is implemented to provide incentives or establish ordinances requiring the purchase of high-efficiency clothes washing machines (HECWs) that meet an average water factor value of 5.0. If the WaterSense Specification (WSS) is less than 5.0, then the average water factor value will decrease by that amount. WaterSense is a partnership program sponsored by the U.S. Environmental Protection Agency (EPA) which makes it easier for Americans to save water by purchasing water-efficient products. Consumers can look for products with the WaterSense label to choose quality, water-efficient products. More information about WSS can be found at <http://www.epa.gov/watersense/index.htm>.

A water factor is the number of gallons per cycle per cubic foot that the clothes washer uses. The lower the water factor, the more efficient the machine is. For example, if a washer uses 30 gallons per cycle and has a tub volume of 3.0 cubic feet, then the water factor is 10.

### 6.6.2 CUWCC Documentation Requirement

Documentation required for DMM 6 includes the number of installations credited to the Agency's replacement program for HECWs with an average water factor value of 5.0. If the WSS is less than 5.0, then the water factor value will decrease to that amount.

### 6.6.3 CUWCC Goal

Incentives shall be provided to 0.9% of current single-family accounts during the first reporting period following implementation, rising to 1% per year for the remainder of a ten year period.

### 6.6.4 AWA Status

The Agency has not yet implemented this DMM.

### 6.6.5 Existing AWA Program

The Agency has not yet implemented this DMM.

### 6.6.6 Future AWA Program

Under the plans for implementing DMM 6, the Agency will initially offer a rebate program to customers residing in the Wastewater Improvement District #11 (WWID #11) which serves the Lake Camanche Village area. Wastewater disposal had become a concern in the Lake Camanche Village. Being able to reduce the quantity of wastewater produced in Lake Camanche Village by reducing water use was determined to be an effective method to counterbalance continued growth. Initially, a rebate of \$75 will be offered. After the first year, the program can be adjusted and/or expanded to other customers throughout the County.

Table 6-5 summarizes program implementation and water savings. The Agency will also require all new residential development utilize HECWs.

**Table 6-5: HECWs Rebate Program**

Planned	FY12	FY13	FY14	FY15	FY16
# of rebates (\$75 each)	35	70	70	70	70
Projected Water Savings (AFY) <sup>a</sup>	0.9	1.7	1.7	1.7	1.7

Notes:

1. Assuming 400 loads/household/year with non-conserving washing machines using 40 gal/load and HECWs using 20 gal/load.
2. This DMM is not budgeted for in FY11.

## 6.7 Demand Management Measure 7

### 6.7.1 CUWCC Description

Public information programs shall be implemented to promote water conservation and water conservation-related benefits. Implementation shall consist of at least the following actions:

1. The program should include, when possible, but is not limited to, providing speakers to employees, community groups and the media; using paid and public service advertising; using bill inserts; providing information on customers' bills showing use for the last billing period compared to the same period the year before; providing public information to promote water conservation measures; and coordinating with other government agencies, industry groups, public interest groups, and the media.
2. The program should include, when possible, social marketing elements which are designed to change attitudes to influence behavior. This includes seeking input from the public to shape the water conservation message; training stakeholders outside the utility staff in water conservation priorities and techniques; and developing partnerships with stakeholders who carry the conservation message to their target markets.
3. When mutually agreeable and beneficial, the wholesale agency or another lead regional agency may operate all or part of the public information program. If the wholesale agency operates the entire program, then it may, by mutual consent with the retail agency, assume responsibility for CUWCC reporting for this BMP. Under this arrangement, a wholesale agency may aggregate all or portions of the reporting and coverage requirements of the retail agencies joining into the mutual consent.

### 6.7.2 CUWCC Documentation Requirement

Agencies may report on all of the following activities, although agencies are only expected to meet the minimum requirements described above:

1. Newsletter articles on conservation
2. Flyers and/or brochures (total copies), bill stuffers, messages printed on bill, information packets
3. Landscape water conservation media campaigns
4. General water conservation information
5. Website
6. Email messages
7. Website - provide link to or list of qualified landscape professionals (WaterSense, California Landscape Contractors Association, Irrigation Association, etc.) and other helpful sites
8. Direct mail - seasonal postcards noting irrigation requirement changes
9. Direct mail or other notification to customer if water use is significantly higher than neighbors with similarly-sized lots
10. Customer notification when neighbor reports runoff or runoff is noticed by employees or meter reads show rise in use of 20% or more from same time previous year
11. Dedicated phone line or “on hold” messages with recorded conservation information
12. Booths at local fairs/events
13. Monthly water use reports provided with comparison of water use to water budget
14. Presentations
15. Point of purchase pieces, including internet point of purchase by type: high-efficiency clothes washers, weather based irrigation controller, high-efficiency toilets, plant palette information, other.
16. Media outreach: news releases, editorial board visits, written editorials, newspaper contacts, television contacts, radio contacts, articles or stories resulting from outreach. Provide names of local media markets: newspaper, TV stations, radio stations reached via media outreach program during the reporting period
17. Adult Education/Training Programs: Topic(s), number of presentations, number of attendees
18. Water Conservation Gardens: involvement in a garden that promotes and educates the public about water-efficient landscaping and conservation techniques. May include “Corporate” or “business” sponsorship or membership.
19. Sponsor or co-sponsor landscape workshops/training for homeowners and/or homeowners associations: number of presentations; number in attendance
20. Landscape watering calculator and watering index to assist with weekly irrigation scheduling
21. Additional program(s) supported by agency but not mentioned above
22. Total reporting period budget expenditure for public outreach/training/adult education programs (include all agency costs)

### 6.7.3 CUWCC Goal

At the minimum, a public information program shall consist of the following components:

1. Contacts with the public at least four times per year
2. Water supplier contacts with media at least four times per year
3. An actively maintained website that is updated at least four times per year
4. Description of materials used to meet minimum requirement
5. Annual budget for public outreach program

### 6.7.4 AWA Status

The Agency is currently implementing this program, but has not yet achieved the CUWCC goal.

### 6.7.5 Existing AWA Program

The Agency believes public awareness of water conservation issues is an important factor in ensuring a reliable water supply. The Agency promotes public awareness of water conservation through many ways. These methods include bill inserts, brochures, a demonstration garden, and special events throughout the year, and water conservation programs sponsored in local schools. The Agency has had public information programs since 1985, but has not historically tracked information. Appendix B displays samples of public information distributed by Amador Water Agency.

### 6.7.6 Future AWA Program

To evaluate the effectiveness of their public information programs, the Agency may survey a sampling of customers to determine what percentage of their customers identifies their public information efforts.

The Agency will continue to implement public outreach strategies, but track them in a more organized fashion. The Agency plans to conduct public presentations and demonstrations, provide a presence at local fairs and events, provide media releases, provide monthly bill inserts, and keep a conservation webpage. The number of each planned activity per fiscal year is shown in Table 6-6.

**Table 6-6: Planned Public Education Programs**

	<i>FY12</i>	<i>FY13</i>	<i>FY14</i>	<i>FY15</i>	<i>FY16</i>
Public Presentations/Demos	4	4	4	4	4
Contacts with Media	4	4	4	4	4
Bill Messages	6	6	6	6	6
Update website	4	4	4	4	4

## 6.8 Demand Management Measure 8

### 6.8.1 CUWCC Description

School education programs are implemented to reach the youngest water users at an early age and enforce the need to engage in water conservation as a life-long behavior. Implementation shall consist of at least the following actions:

1. Implement a school education program to promote water conservation and water conservation-related benefits.
2. Programs shall include working with school districts and private schools in the water suppliers' service area to provide instructional assistance, educational materials, and classroom presentations

that identify urban, agricultural, and environmental issues and conditions in the local watershed. Educational materials shall meet the state education framework requirements and grade-appropriate materials shall be distributed.

3. When mutually agreeable and beneficial, the wholesale agency or another lead regional agency will operate all or part of the education program; if the wholesale agency operates all or part of the retail agency's school education program, then it may, by mutual consent with the retail agency, assume responsibility for CUWCC reporting of this BMP; under this arrangement, a wholesale agency may aggregate all or portions of the reporting and coverage requirements of the retail agencies joining into the mutual consent.

The Agency shall maintain an active school education program to educate students in the agency's service area about water conservation and efficient water use. An agency may participate in a mutual arrangement as described above.

### **6.8.2 CUWCC Documentation Requirement**

Agencies may report on all of the following activities, although they are only expected to meet the minimum requirements described above:

1. Classroom presentations: number of presentations, number of attendees, topics covered: conservation, recycled water, water sources, pollution prevention, etc.
2. Large group assemblies: number of presentations, number of attendees
3. Children's water festivals or other events: number of presentations, number of attendees
4. Cooperative efforts with existing science/water education programs (various workshops, science fair awards or judging) and follow-up: number of presentations, number of attendees
5. Other methods of disseminating information (i.e. themed age-appropriate classroom loaner kits); Description; number distributed
6. Staffing children's booths at events & festivals: number of booths, number of attendees
7. Water conservation contests such as poster and photo; Description; number of participants
8. Offer monetary awards/funding or scholarships to students: number offered; total funding
9. Teacher training workshops: number of presentations, number of attendees
10. Fund and/or staff student field trips to treatment facilities, recycling facilities, water conservation gardens, etc.: number of tours or field trips, number of participants
11. College internships in water conservation offered: number of internships; total funding
12. Career fairs/workshops: number of presentations, number of attendees
13. Additional program(s) supported by agency but not mentioned above; Description; number of events (if applicable); number of participants
14. Total reporting period budget expenditures for school education programs (include all agency costs)

### **6.8.3 CUWCC Goal**

The following are the goals for obtaining compliance with this DMM:

1. Curriculum materials developed and/or provided by agency (including confirmation that materials meet state education framework requirements and are grade-level appropriate).

2. Materials distributed to K-6 students. When possible, school education programs will reach grades 7-12 as well.
3. Description of materials used to meet minimum requirement.
4. Annual budget for school education program.
5. Description of all other water supplier education programs.

#### 6.8.4 AWA Status

The Agency is currently implementing this program, but has not yet achieved the CUWCC goal.

#### 6.8.5 AWA Existing Program

In the past, the Agency has provided school education programs, including presentations and demonstrations, on a per request basis. Educational materials and videos for this program are provided by the Agency and include water-themed coloring books and conservation tips from “Aqua Annie.” To appeal to younger children, a duck costume is available for a staff member to wear to the presentations as Aqua Annie. Appendix C contains examples of materials used for school education programs.

#### 6.8.6 AWA Future Program

The Agency will formalize its school education program, focusing on outreach to fifth graders (the age best identified for reaching children and instilling the importance of water conservation). Specifically, the Agency will visit all fifth grade classes in their service area, giving a presentation that covers the agency’s role in supplying water, the importance of managing water resources and water conservation tips. Each fifth grader will be given a low-flow showerhead to install in their own homes with their parents’ permission. The effectiveness of school programs will be evaluated as part of the plumbing retrofit evaluations described in DMM 1. Table 6-7 summarizes the planned school education presentations to all fifth grade classes and the estimated water savings that may result from the low-flow showerhead distribution.

**Table 6-7: Planned School Education Presentations**

	<i>FY12</i>	<i>FY13</i>	<i>FY14</i>	<i>FY15</i>	<i>FY16</i>
# of giveaways	156	311	311	311	311
# presentations	3	6	6	6	6
total water savings	2.2	4.4	4.4	4.4	4.4

Note: In FY11, the Agency will give 2 presentations; giveaways will begin in FY12.

## 6.9 Demand Management Measure 9

### 6.9.1 CUWCC Description

Commercial, industrial, and institutional (CII) water use varies dramatically between business sectors and location. This DMM includes implementing measures to achieve a water savings. Potential measures include, but are not limited to:

- Industrial process water use reduction
- Industrial laundry retrofits
- Car wash recycling systems
- Water efficient commercial dishwashers
- Wet cleaning

### **6.9.2 CUWCC Documentation Requirement**

The Agency shall report the measure type and quantity installed, as well as water savings attributed to water shortage measures, intervention and actions.

### 6.9.3 CUWCC Goal

The CUWCC goal is to save 10% of baseline CII water use over a 10-year period by reducing water use as follows:

- 0.5% by end of first reporting period (i.e. year 2)
- 2.4% by the end of year 4
- 4.3% by the end of year 6
- 6.4% by the end of year 8
- 9% by the end of year 10

**Table 6-8: Demonstrated CII Water Savings<sup>1</sup>**

Measure	Annual Savings (AF)	Measure Life (years)
HE Toilets	0.041748	25
HE Urinals	0.069086	25
Ultra Low Volume Urinals	0.080603	25
Zero Consumption Urinals	0.0921146	25
Commercial HE Single Load Clothes Washers	0.116618	10
Cooling Tower Conductivity Controllers	1.032250	5
Cooling Tower ph Controllers	3.981543	5
Connectionless Food Steamers	Per Steamer Compartment – 0.25	10
Medical Equipment Steam Sterilizers	1.538	20
Water-Efficient Ice Machines	0.834507	10
Pressurized Water Brooms	0.1534	5
Dry Vacuum Pumps	0.64	7

Source: CUWCC MOU Regarding Urban Water Conservation (December 2008)

### 6.9.4 AWA Status

The Agency has not yet implemented this DMM.

### 6.9.5 Existing AWA Program

Historically, the Agency has offered to review plans for new CII customers. The Agency has provided water use audits to any CII customer upon request since 1985 as an informal service; therefore, historical records have not been kept.

### 6.9.6 Future AWA Program

Currently, the Agency has about 389 CII accounts of which about 95 percent are mixed-use accounts. There is also one unmetered commercial account which will be retrofitted with a meter under DMM 4. The Agency will recognize a formal survey program for CII accounts which will include free water use surveys (upon request) and evaluations of water using apparatus and processes, and recommended efficiency measures. Table 6-9 summarizes the projected CII conservation program. Rebates will be provided for some water saving devices such as those included in Table 6-10. This DMM would not satisfy the level of coverage as described in the CUWCC. If additional funding were made available, the Agency could expand the program and provide additional surveys, rebates, and follow-up visits.

**Table 6-9: Estimated CII Programs**

	<i>FY12</i>	<i>FY13</i>	<i>FY14</i>	<i>FY15</i>	<i>FY16</i>
# of on-site surveys	10	15	15	20	30
# of rebates provided	5	10	10	10	10
# of follow-up visits	3	5	5	5	5
Projected water savings - AFY	2	3	3	4	6

Note: This DMM is not budgeted for in FY11.

**Table 6-10: Agency CII Rebates**

Device	Incentive Amount
WSS Toilets	\$50
Urinal	\$50
HECW	\$75
Water Broom	\$100
Cooling Tower Controller	\$500

## 6.10 Demand Management Measure 10

### 6.10.1 CUWCC Description

This DMM addresses the assistance relationships between regional wholesale agencies and intermediate wholesale agencies as well as between wholesale agencies and retail agencies. These relationships are applied in the following way:

1. Financial investments and building partnerships

When mutually agreeable and beneficial to a wholesaler and its retail agencies, a wholesaler will provide financial assistance and help build partnerships to accomplish conservation. Wholesale water suppliers will consider avoided capital costs when making financial investments and build regional partnerships to advance water conservation efforts and effectiveness. Where applicable, intermediate wholesale water suppliers that receive conservation-related financial incentives from regional wholesalers will pass through eligible financial incentives to retail agencies operating programs at the retail level.

2. Technical support

When requested, wholesale water agencies will provide conservation-related technical support and information to retail agencies they serve. Support and information will include, but will not be limited to: workshops and support advice addressing conservation program planning, design, implementation, and evaluation.

3. Program management

When mutually advantageous, wholesale and retail water agencies will join together to plan, design, implement, manage, and evaluate regional conservation programs.

When mutually agreeable and beneficial, the wholesale agency or another lead regional agency will operate all or part of the conservation program; if the wholesale agency or other lead regional agency operates all or part of a program, then it may, by mutual consent with the retail agency,

assume responsibility for CUWCC reporting for funded BMPs; under this arrangement, a wholesale agency or other lead regional agency may aggregate all or portions of the reporting and coverage requirements of all retail agencies joining into the mutual consent.

4. Water shortage allocations

Wholesale agencies shall pursue water shortage allocation policies or plans which minimize disincentives to long-term water conservation, and encourage and reward investments in long-term conservation shown to advance regional water supply reliability and sufficiency.

5. Non-signatory reporting

To the extent possible, wholesale water agencies will provide reports on BMP implementation within their service area by retail water agencies that are not signatories to the MOU.

6. Encourage CUWCC membership

Wholesale agencies will encourage all of their retail agencies to become MOU signatories, provide information to assist the CUWCC in recruitment targeting, and may assist in paying CUWCC dues for their retail agencies.

### 6.10.2 CUWCC Documentation Requirement

The following documentation is considered acceptable under this DMM:

- Financial investments and building partnerships: List the total monetary amount of financial incentives and equivalent resources provided to retail members to assist with, or to otherwise support, implementation of BMPs, subtotaled by BMP. List regional partnerships developed to encourage resource conservation and maximize economies of scale benefits.
- Technical support: Supply a summary of types of technical support provided to retail agencies.
- Program management: If the wholesale agency has assumed reporting responsibility, list the programs managed on behalf of its retail agencies.
- Water shortage allocation: If a water shortage allocation plan or policy has been developed, provide the date of adoption and electronic link to the document or hard copy.
- Non-signatory reporting: Receipt of reports.
- Encourage CUWCC membership: List of efforts to recruit retailers and amount of dues paid on behalf of retail agencies.

### 6.10.3 CUWCC Goal

Provide financial and managerial assistance to retail agencies for implementation of BMPs in the Agency's service area.

### 6.10.4 AWA Status

The Agency is currently implementing this program, but has not yet achieved the CUWCC goal.

### 6.10.5 Existing AWA Program

The Agency has offered the same demand management programs and services to its wholesale customers as it does to its retail customers since 1980. The Agency wholesales water to six communities: Jackson, Plymouth, Drytown CSD, Pine Grove CSD, Rabb Park CSD, and Mace Meadows. Because the Agency's wholesale customers are provided the same demand management programs and services as retail customers, the wholesale program results have not been tracked or allocated separately.

### 6.10.6 Future AWA Program

To successfully implement the DMM, the Agency will extend its survey and rebate programs to include the service areas of its retailers. Table 6-11 documents the additional surveys and rebates that will be

offered to the Agency's wholesale areas. In addition to the surveys and rebates shown below, the Agency will offer program management assistance to its retailers and will initiate discussions regarding agreements for conservation planning implementation.

**Table 6-11: Planned Assistance to Retail Agencies**

	<i>FY12</i>	<i>FY13</i>	<i>FY14</i>	<i>FY15</i>	<i>FY16</i>
# of Surveys	5	10	10	10	10
# of Water Budgets	1	2	2	2	2
# of Residential Rebates	5	10	10	10	10
# of Industrial Rebates	3	6	6	6	6

Note: This DMM is not budgeted for in FY11.

## 6.11 Demand Management Measure 11

### 6.11.1 CUWCC Description

DMM 11 promotes water conserving retail water rate structures. This DMM recognizes that each agency or water enterprise fund has a unique rate setting system and history. When creating a rate case, professional judgments are made to determine whether costs are accounted to a variable or fixed cost center by the staff of the agency. The final water rate case is an accumulation of all the decisions and judgments made by staff and supplemented by the financial projections leading an agency to establish its final water rate recommendation. DMM 11 is not intended to supplant this process, but rather to reinforce the need to establish a strong nexus between volume-related system costs and volumetric commodity rates.

DMM 11 also applies to retail sewer service. Conservation pricing of sewer service provides incentives to reduce average or peak use, or both. Such pricing includes: rates designed to recover the cost of providing service, and billing for sewer service based on metered water use. Conservation pricing of sewer service is also characterized by one or more of the following components: rates in which the unit rate is the same across all units of service (uniform rates); rates in which the unit rate increases as the quantity of units purchased increases (increasing block rates); rates in which the unit rate is based upon the long-run marginal cost or the cost of adding the next unit of capacity to the sewer system. Rates that charge customers a fixed amount per billing cycle for sewer service regardless of the units of service consumed do not satisfy the definition of conservation pricing of sewer service. Rates in which the typical bill is determined by high fixed charges and low commodity charges also do not satisfy the definition of conservation pricing of sewer service.

Conservation pricing requires volumetric rates. While this DMM defines a minimum percentage of water sales revenue from volumetric rates, the goal of this DMM is to recover the maximum amount of water sales revenue from volumetric rates that is consistent with utility costs (which may include utility long-run marginal costs), financial stability, revenue sufficiency, and customer equity. In addition to volumetric rates, conservation pricing may also include one or more of the following other charges:

1. Service connection charges designed to recover the separable costs of adding new customers to the water distribution system.
2. Monthly or bimonthly meter/service charges to recover costs unrelated to the volume of water delivered or new service connections and to ensure system revenue sufficiency.
3. Special rates and charges for temporary service, fire protection service, and other irregular services provided by the utility.

The following volumetric rate designs are potentially consistent with the above definition:

1. Uniform rate in which the volumetric rate is constant regardless of the quantity consumed.
2. Seasonal rates in which the volumetric rate reflects seasonal variation in water delivery costs.
3. Tiered rates in which the volumetric rate increases as the quantity used increases.
4. Allocation-based rates in which the consumption tiers and respective volumetric rates are based on water use norms and water delivery costs established by the utility.

Adequacy of Volumetric Rates: A retail agency's volumetric rate shall be deemed sufficiently consistent with the definition of conservation pricing when it satisfies at least one of the following two options.

- Option 1: Let V stand for the total annual revenue for the volumetric rate(s) and M stand for total annual revenue from customer meter/service (fixed) charges, then:

$$\frac{V}{(V+M)} \geq 70\%$$

This calculation shall only include utility revenues from volumetric rates and monthly or bimonthly meter/service charges. It shall not include utility revenues from new service connection charges; revenue from special rates and charges for temporary service, fire protection, or other irregular services; revenue from grants or contributions from external sources in aid of construction or program implementation; or revenue from property or other utility taxes.

- Option 2: Use the rate design model included with the Municipal Water and Wastewater Rate Manual published by the Canadian Water & Wastewater Association with the signatory's water system and cost information to calculate V', the uniform volumetric rate based on the signatory's long-run incremental cost of service, and M', the associated meter charge. [Let HCF be annual water delivery (in hundred cubic feet).] The volumetric rate(s) shall be deemed sufficiently consistent with the definition of conservation pricing if:

$$\frac{V}{(V+M)} \geq \frac{V'}{(V'+M')}$$

The rate design model can be downloaded at <http://www.cuwcc.org/resource-center/technical-resources/bmp-tools.aspx>.

This calculation shall only include utility revenues from volumetric rates and monthly or bimonthly meter/service charges. It shall not include utility revenues from new service connection charges; revenue from special rates and charges for temporary service, fire protection, or other irregular services; revenue from grants or contributions from external sources in aid of construction or program implementation; or revenue from property or other utility taxes.

The Agency shall maintain a rate structure that satisfies at least one of the options specified above. Conformance to Option 1 or Option 2 will first be assessed using the revenue from the most recent year. If the most recent year does not satisfy the option, the average revenue from the three (3) most recent years will be used.

### 6.11.2 CUWCC Documentation Requirement

For water, provide the following:

1. Report the rate structure in effect for each customer class for the reporting period.
2. Report the annual revenue derived from volume charges for each retail customer class, as defined above. (Note: Compliance with BMP 11 will be determined based on the Agency's total revenue from all retail customer classes.)
3. Report the annual revenue derived from monthly or bimonthly meter/service charges for each retail customer class, as defined above.
4. If agency does not comply with Option 1 in Section A, report  $v'$  and  $m'$  as determined by the Canadian Water & Wastewater Association rate design model described above.
5. If agency does not comply with Option 1 in Section A, submit the completed Canadian Water & Wastewater Association rate design model described above.

For sewer, provide the following:

1. Report annual revenue requirement for sewer service by customer class for the reporting period.
2. Report annual revenue for sewer service from commodity charges by customer class for the reporting period.
3. Report rate structure by customer class for sewer service.

### 6.11.3 CUWCC Goal

The CUWCC goal for DMM 11 varies depending on the option for volumetric pricing selected. Table 6-12 summarizes the CUWCC goals.

Table 6-12: CUWCC Goals for DMM 11

Years After Start Year	For Option 1	For Option 2
1	$\frac{V}{(V+M)} \geq 70\% \times 0.70$	$\frac{V}{(V+M)} \geq \frac{V'}{(V'+M')} \times 0.7$
2	$\frac{V}{(V+M)} \geq 70\% \times 0.80$	$\frac{V}{(V+M)} \geq \frac{V'}{(V'+M')} \times 0.8$
3	$\frac{V}{(V+M)} \geq 70\% \times 0.90$	$\frac{V}{(V+M)} \geq \frac{V'}{(V'+M')} \times 0.9$
4	$\frac{V}{(V+M)} \geq 70\% \times 1.00$	$\frac{V}{(V+M)} \geq \frac{V'}{(V'+M')} \times 1.0$

### 6.11.4 AWA Status

The Agency is currently implementing this program, but has not yet achieved the CUWCC goal.

### 6.11.5 Existing AWA Program

The Agency's first conservation pricing rates were adopted in 1980. Since then, the rates have been adjusted and amended several times, most recently in 2005. The Agency uses a tiered structure for water service rates in the communities where it provides retail water service from the CAWP system. This is a major

factor in promoting effective water conservation. Tiered rates for the Amador Water System (2,500 foot elevation and below) have not yet been developed. The Agency's water rates and charges are included in Appendix D. Table 6-13 summarizes the Agency's current conservation pricing structure. Table 6-14 is an example of the water pricing structure. Table 6-15 is an example of the wastewater pricing structure for the Agency's wastewater customers.

**Table 6-13: Amador Water Agency Conservation Pricing**

<b>Residential</b>			
Water rate structure:	Service Charge plus a 2-tier commodity rate	Sewer rate structure:	Flat user charge
Year rate effective:	Varies by system <sup>a</sup>	Year rate effective:	Varies by system <sup>a</sup>
<b>Commercial</b>			
Water rate structure:	Service Charge plus a 1-tier commodity rate	Sewer rate structure:	Flat user charge
Year rate effective:	Varies by system <sup>a</sup>	Year rate effective:	Varies by system <sup>a</sup>
<b>Industrial</b>			
Water rate structure:	Service Charge plus a 1-tier commodity rate	Sewer rate structure:	n/a
Year rate effective:	Varies by system <sup>a</sup>	Year rate effective:	n/a
<b>Institutional/Government</b>			
Water rate structure:	Service Charge plus a 1-tier commodity rate	Sewer rate structure:	n/a
Year rate effective:	Varies by system <sup>a</sup>	Year rate effective:	n/a
<b>Irrigation</b>			
Water rate structure:	Service Charge plus a 1-tier commodity rate		
Year rate effective:	Varies by system <sup>a</sup>		
<b>Wholesale</b>			
Water rate structure:	Service Charge plus a 1-tier commodity rate		
Year rate effective:	Varies by system <sup>a</sup>		

Note: See Appendix D for price and dates adopted for each water and wastewater system.

**Table 6-14: Example Water Pricing**

<b>Metered Treated (Routes 02-13)</b>	<b>Per Month</b>	<b>Per Unit</b>
5/8" Monthly Service Charge	\$25.20	\$1.90
48 Hour Late Notice Charge	\$10.00	
Meter set fee (5/8" meter)	\$375.00	
AWS Treated Retail Participation fee (5/8" meter)	\$11,300.00	
AWS Treated Participation fee (wholesale)	\$8,030.00	
<b>Flat Rate Treated (Routes 09-13)</b>	<b>Per Month</b>	
Monthly Service Charge (7000 sq. ft. or less)	\$76.96	
7001 to 16000 sq. ft.	\$90.20	
16001 to 25000 sq. ft.	\$203.15	
Additional dwelling unit	\$44.20	
48 Hour Late Notice Charge	\$10.00	
<b>Metered Untreated (Route 01 and 08)</b>	<b>Per Month</b>	<b>Per Unit</b>
5/8" Monthly Service Charge	\$19.60	\$0.53
48 Hour Late Notice Charge	\$10.00	
Meter set fee (5/8" meter)	\$375.00	
AWS Raw Water Participation Fee	\$3,130.00	
<b>Flat Rate Untreated (Route 01 and 08)</b>	<b>Per Month</b>	
Monthly Service Charge (7000 sq. ft. or less)	\$36.92	
7001 to 16000 sq. ft.	\$40.61	
16001 to 25000 sq. ft.	\$61.67	
Additional dwelling unit	\$24.85	
48 Hour Late Notice Charge	\$10.00	
<b>CAWP Retail (Routes 15-21, 23, 31-32)</b>	<b>Bi-monthly</b>	<b>Per Unit</b>
5/8" Bi-monthly service charge	\$67.50	
1-20 units		\$2.08
21 & more units		\$3.12
<i>Non-residential Commodity Rate (all units)</i>		\$2.49
48 Hour Late Notice Charge	\$10.00	
Annual Assessment (July) <i>Unconnected accts. only</i>	\$70.00 per year	
Meter set fee (5/8" meter)	\$375.00	
CAWP Wholesale Annexation Fee	\$5,645.00	
CAWP Retail Participation fee	\$3,815.00	
<b>ID#3 La Mel Heights (Route 22)</b>	<b>Bi-monthly</b>	<b>Per Unit</b>
		\$1.65 (1-100 units)
		\$2.45 (101 units or more)
5/8" Bi-Monthly Service Charge	\$80.00	
Annual Assessment \$180.00	\$30.00	
48 Hour Late Notice Charge	\$10.00	
Meter set fee (5/8" meter)	\$375.00	

Table 6-14 continued from previous page		
ID#7 Lake Camanche (Route 33)	Bi-monthly	Per Unit
5/8" Bi-Monthly Service Charge	\$47.50	
1-50 units		\$1.16
51+ units		\$1.94
48 Hour Late Notice Charge	\$10.00	
Meter set fee (5/8" meter)	\$375.00	
ID#7 Retail Participation fee	\$4,280.00	
ID#7 Equalization fee	\$8,220.00	
<i>Annual Non-metered Charge (Route 37)</i>	<i>\$100.00</i>	
	<i>Annually</i>	

Note: As of 2010

Table 6-15: Example Wastewater Pricing

	Standby	User Rate
<b>Eagle's Nest- WW ID No.2</b>		
Monthly Service Charge Route 51	\$30.00	\$86.55
Sewer Permit/Inspection Fee	\$350.00	\$350.00
48 Late Notice Charge	\$10.00	\$10.00
<b>Surrey Junction- WW ID No. 3</b>		
Monthly Service Charge Route 52	\$27.00	\$86.55
Sewer Permit/Inspection Fee	\$350.00	\$350.00
48 Late Notice Charge	\$10.00	\$10.00
<b>Wildwood- WW ID No. 4</b>		
Monthly Service Charge Route 53	\$21.00	\$86.55
Sewer Permit/Inspection Fee	\$3500.00	\$350.00
48 Late Notice Charge	\$10.00	\$10.00
<b>Gayla Manor- WW ID No. 5</b>		
Monthly Service Charge Route 54	\$34.00	\$86.55
Sewer Permit/Inspection Fee	\$350.00	\$350.00
48 Late Notice Charge	\$10.00	\$10.00
<b>Jackson Pines- WW ID No. 6</b>		
Monthly Service Charge Route 57	\$39.60	\$86.55
Sewer Permit/Inspection Fee	\$350.00	\$350.00
48 Late Notice Charge	\$10.00	\$10.00
<b>Fairway Pines- WW ID No. 7</b>		
Monthly Service Charge Route 56	\$39.60	\$71.75
Sewer Permit/Inspection Fee	\$250.00	\$250.00
48 Late Notice Charge	\$10.00	\$10.00
<b>Pine Grove- WW ID No. 8</b>		
Monthly Service Charge Route 58	\$27.73	\$101.55
Sewer Permit/Inspection Fee	\$350.00	\$350.00
PGWW Buy in Fee	\$3705.00	
48 Late Notice Charge	\$10.00	\$10.00
<b>Viewpoint- WW ID No. 9</b>		
Monthly Service Charge Route 55	\$39.60	\$86.55
Sewer Permit/Inspection Fee	\$350.00	\$350.00
48 Late Notice Charge	\$10.00	\$10.00
<b>Tiger Creek Estates- WW ID No. 10</b>		
Monthly Service Charge Route 59	\$32.56	\$86.55
Sewer Permit/Inspection Fee	\$350.00	\$350.00
48 Late Notice Charge	\$10.00	\$10.00

<b>Table 6-15 continued from previous page</b>		
<b>Lake Camanche- WW ID No. 11 (Route 35 &amp; 39)</b>	<b>Standby</b>	<b>User Rate</b>
Monthly Service Charge (with water meter)		\$94.20
-without water meter		
Special Facility Fee/per unit of use	\$5,565.00	
Facility Expansion Charge	\$18,970.00	
Sewer Permit/Inspection Fee	\$350.00	
48 Hour Late Notice Charge	\$10.00	
<b>Martell- WW ID No. 12 (Route 30)</b>		<b>User Rate</b>
Monthly User Rate (Residential)		\$64.39
Monthly User Rate (Commercial)		
Fixed Service Charge (per EDU)		\$20.79
Low Strength Users (per CCF)		\$7.95
Medium Strength Users (per CCF)		\$9.70
High Strength Users (per CCF)		\$13.20
Equalization Charge/per unit of use	\$9,682.00	
Sewer Permit/Inspection Fee	\$350.00	
48 Hour Late Notice Charge	\$10.00	

Footnote: As of 2010

### 6.11.6 Future AWA Program

The Agency calculated  $V/(V+M)$ , which equals 51%. V is equal to the total annual revenue from volumetric rates and M equals the total annual revenue from customer service (fixed) charges. For AWA, V is equal to \$3.4 million and M is equal to \$3.3 million. The Agency is currently meeting the requirement for Year 1 for Option 1, as 51% is greater than  $0.7 \times 70\%$  (or 49%). The Agency will continue to charge volumetric pricing and increase the volumetric component until full coverage is achieved.

## 6.12 Demand Management Measure 12

### 6.12.1 CUWCC Description

Under DMM 12, a person will be designated as the agency's responsible conservation coordinator for program management, tracking, planning, and reporting on BMP implementation. Coverage shall consist of staffing and maintaining the position of trained conservation coordinator, or equivalent consulting support, and provide that function with the necessary resources to implement BMPs.

### 6.12.2 CUWCC Documentation Requirement

Provide the contact information for the conservation coordinator, or consultant assigned, and verification that the position is responsible for implementing the tasks identified above.

### 6.12.3 CUWCC Goal

Staff and maintain a position of a trained conservation coordinator.

### 6.12.4 AWA Status

Until recently, this DMM has been fully implemented.

### 6.12.5 Existing AWA Program

The Agency has historically has assigned conservation coordinator duties to a member of the Agency's staff. However, the Agency's recent Conservation Coordinator has retired and a new coordinator has not yet been named. Once appointed, the Agency's Conservation Coordinator will be responsible for the conservation program management, tracking, planning, and reporting on implementation of the DMMs as described in this Plan.

### 6.12.6 Future AWA Program

The Agency plans to appoint a replacement Conservation Coordinator, however, due to current budget constraints, this position will only be staffed half-time. If outside funding were obtained for program implementation, a full-time conservation coordinator will be hired.

## 6.13 Demand Management Measure 13

### 6.13.1 CUWCC Description

The CUWCC describes this DMM as applying in three different ways:

1. New development – Enact, enforce, or support legislation, regulations, ordinances, or terms of service that (1) prohibit water waste such as, but not limited to: single-pass cooling systems; conveyer and in-bay vehicle wash and commercial laundry systems which do not reuse water; non-recirculating decorative water fountains and (2) address irrigation, landscape, and industrial, commercial, and other design inefficiencies.
2. Existing users – Enact, enforce, or support legislation, regulations, ordinances, or terms of service that prohibit water waste such as, but not limited to: landscape and irrigation inefficiencies, commercial or industrial inefficiencies, and other misuses of water.
3. Water shortage measures – Enact, enforce, or support legislation, regulations, ordinances, or terms of service that facilitate implementation of water shortage response measures.

To successfully implement this DMM, the Water Agency shall do one or more of the following:

- a) Enact and enforce an ordinance or establish terms of service that prohibit water waste
- b) Enact and enforce an ordinance or establish terms of service for water efficient design in new development
- c) Support legislation or regulations that prohibit water waste
- d) Enact an ordinance or establish terms of service to facilitate implementation of water shortage response measures
- e) Support local ordinances that prohibit water waste
- f) Support local ordinances that establish permit requirements for water efficient design in new development.

### 6.13.2 CUWCC Documentation Requirement

Documentation requirements for DMM 13 include the following:

- A description of, or electronic link to, any ordinances or terms of service adopted by water agency to meet the requirements of this BMP
- A description of, or electronic link to, any ordinances or requirements adopted by local jurisdictions or regulatory agencies within the water agency's service area.
- A description of water agency efforts to cooperate with other entities in the adoption or enforcement of local requirement consistent with this BMP.

- A description of agency support positions with respect to adoption of legislation or regulations consistent with this BMP.

### 6.13.3 CUWCC Goal

Adopt and enforce a water waste ordinance.

### 6.13.4 AWA Status

The Agency has implemented this DMM through its adoption of a water conservation policy that supports local ordinance that prohibits water waste.

### 6.13.5 Existing AWA Program

The Agency first adopted a water shortage plan in 1985. The Agency has both voluntary and mandatory water conservation policies in the Amador Water Agency Water Code. Specific measures include:

- unattended watering prohibited
- shortening irrigation season
- restrictions on car, boat, building and trailer washing
- restrictions on the washing of sidewalks and driveways
- restrictions on filling of swimming pools
- restrictions on use of potable water for sewer flushing, dust control, earth compaction and other construction uses

The Agency's water shortage ordinance is included in Appendix E, but a water waste ordinance has not been adopted.

### 6.13.6 Future AWA Program

The Agency will consider the development and adoption of a water waste ordinance by the end of 2012. The ordinance would be a year-round policy that prohibits overwatering landscape, system leaks, and open hoses for example, among other water wasting actions. Violators would receive oral and/or written notice of violation. Repeat violators, both residential and commercial, could be fined up to \$1,000 and \$2,000, respectively.

## 6.14 Demand Management Measure 14

### 6.14.1 CUWCC Description

Under DMM 14, the Agency will provide financial incentives or ordinances requiring the replacement of existing toilets using 3.5 or more gallons per flush (gpf) with a toilet meeting WSS. WaterSense high efficiency toilets use a maximum of 1.28 gpf, which is 20% less than the current federal standard of 1.6 gpf. Ultra low-flow toilets (ULFT) differ in that they cannot be WaterSense certified and they do not save as much water. Numerous toilets have been certified to meet WaterSense criteria and retailers are committed to making them available in stores. A complete list of certified toilets can be accessed here:

[http://www.epa.gov/WaterSense/pp/find\\_het.htm](http://www.epa.gov/WaterSense/pp/find_het.htm).

### 6.14.2 CUWCC Documentation Requirement

Documentation requirements for DMM 14 include a description of the program and the number of WSS toilet installations credited to the Agency's replacement program disaggregated by single-family or multi-family units.

### 6.14.3 CUWCC Goal

Demonstrate a number of toilet replacements of 3.5 gpf or greater, toilets at or above the level achieved through a retrofit on resale ordinance until 2014, or a market saturation of 75% is demonstrated, whichever is sooner.

### 6.14.4 AWA Status

The Agency has not yet implemented this DMM.

### 6.14.5 Existing AWA Program

The Agency has not yet implemented this DMM.

### 6.14.6 Future AWA Program

Similar to the High Efficiency Clothes Washers (HECWs) rebate program that the Agency will implement under DMM 6, the WSS Toilet rebate program will be available, initially, only to customers in Wastewater Improvement District #11 (WWID #11), which serves the Lake Camanche Village area, due to wastewater disposal problems in the area. After one year, the WSS Toilet rebate program will be evaluated for cost efficiency, public participation and response, and changes in quantity of wastewater effluent. Initially, \$50 rebates will be offered for WSS Toilets. The program can then be adjusted, as necessary. The rebate program will likely be expanded and offered to the entire County by 2012. The WSS Toilet rebate program would have the multi-beneficial result of reducing both wastewater production and water demand in the Lake Camanche Village region.

Table 6-16 summarizes the planned program costs and water savings.

**Table 6-16: Single Family WSS Toilet Replacement Program**

	<i>FY12</i>	<i>FY13</i>	<i>FY14</i>	<i>FY15</i>	<i>FY16</i>
# of WSS Toilet rebates to be paid	15	30	30	30	30
Projected Water Savings (AFY) <sup>a</sup>	0.4	0.9	0.9	0.9	0.9

Note: Assuming 2.5 people per household with non-conserving toilets using 18.7 gal/day/person and WSS toilet using 8.3 gal per day per person.

## 6.15 Effectiveness Evaluation 15

In order to evaluate the effectiveness of each of the fourteen DMMs, the Agency will utilize two benchmarks: (1) did the Agency complete the task identified under each DMM and (2) did the water savings achieved meet or exceed the anticipated water savings. The benchmarks will be evaluated annually, and a formal report will be included in the 2015 update to the UWMP.

## 6.16 Estimate of Savings 16

Beginning Fiscal Year 2011-2012, the Agency will begin implementation of the WCP. Below is a summary of the estimated water savings for the next five years.

**Table 6-17: Estimate of Water Savings**

	<i>FY11-12 (AF)</i>	<i>FY12-13 (AF)</i>	<i>FY13-14 (AF)</i>	<i>FY14-15 (AF)</i>	<i>FY15-16 (AF)</i>
DMM 2	2.7	5.5	5.5	5.5	5.5
DMM 5	3.9	5.3	5.3	5.3	5.3
DMM 6	0.9	1.7	1.7	1.7	1.7
DMM 8	2.2	4.4	4.4	4.4	4.4
DMM 9	2.0	3.0	3.0	4.0	6.0
DMM 14	0.4	0.9	0.9	0.9	0.9
TOTAL SAVINGS	12.1	20.8	20.8	21.8	23.8

Note: Potential water savings from DMMs 1, 3, 4, 7, and 10-13 were not quantified in the 2010 Water Conservation Plan.

An evaluation of the effect of the conservation program on the Agency's ability to further reduce demand will be included in the 2015 update to the UWMP.

## Chapter 7 Appendices

### Appendix A References

---

Amador County 2010 Housing Element & General Plan

City of Sutter Creek 2008 Housing Element & General Plan

City of Plymouth 2011 Housing Element & General Plan

City of 2009 Ione General Plan & General Plan

City of Jackson 2010 Housing Element & General Plan

Amador County Regional Wastewater Management Plan- Initial Phasing and Interim Improvements  
Regional Approach for Water Reuse Project (2005)

Amador Water Agency (2005-2010) Department of Health Services' Annual Report to the Drinking Water Program Buckhorn Water Treatment Plant

Amador Water Agency (2005-2010) Department of Health Services' Annual Report to the Drinking Water Program Tanner Water Treatment Plant

Amador Water Agency (2005-2010) Department of Health Services' Annual Report to the Drinking Water Program Ione Water Treatment Plant

Amador Water Agency (2005-2010) Department of Health Services' Annual Report to the Drinking Water Program La Mel Heights Water Treatment Plant

Amador Water Agency (2005-2010) Department of Health Services' Annual Report to the Drinking Water Program Lake Camanche Water Treatment Plant

Amador Water Agency (2005) Urban Water Management Plan

Amador Water Agency AWS Participation Fee Study 2007

Department of Water Resources 2003 California's Groundwater Bulletin 118: San Joaquin Valley Groundwater Basin Cosumnes Subbasin.

Amador Local Agency Formation Commission Municipal Services Review 2008

City of Sutter Creek Wastewater Master Plan 2007

California Water Code, Division 6, Part 2.6, and §§10610 through §§10657

California Assembly Bill 797

California Department of Water Resources Guidebook to Assist Urban Water Suppliers to Prepare a 2010 Urban Water Management Plan

Mokelumne Amador Calaveras Integrated Regional Water Management Plan (IRWMP)

State of California, Department of Finance, E-4 & E-5, May 2010.

State of California Water Conservation Bill of 2009

Methodologies for Calculating Baseline and Compliance Urban Per Capita Water Use (For the Consistent Implementation of the Water Conservation Bill of 2009) (DWR 2010a).

California Integrated Water Quality System 2010 Amador Water Agency Reports for Lake Camanche, Eagles Nest, Fairway Pines/Mace Meadows, Gayla Manor, Martell, Pine Grove, Jackson Pines, & Wildwood

## Appendix B Completed UWMP Checklist

**Table 7-1 Urban Water Management Plan checklist, organized by subject**

No.	UWMP requirement <sup>a</sup>	CA Water Code Reference	Additional clarification	UWMP location
<b>PLAN PREPARATION</b>				
4	Coordinate the preparation of its plan with other appropriate agencies in the area, including other water suppliers that share a common source, water management agencies, and relevant public agencies, to the extent practicable.	10620(d)(2)		1.3
6	Notify, at least 60 days prior to the public hearing on the plan required by Section 10642, any city or county within which the supplier provides water that the urban water supplier will be reviewing the plan and considering amendments or changes to the plan. Any city or county receiving the notice may be consulted and provide comments.	10621(b)		1.3 App. C
7	Provide supporting documentation that the UWMP or any amendments to, or changes in, have been adopted as described in Section 10640 et seq.	10621(c)		1.4
54	Provide supporting documentation that the urban water management plan has been or will be provided to any city or county within which it provides water, no later than 60 days after the submission of this urban water management plan.	10635(b)		1.4
55	Provide supporting documentation that the water supplier has encouraged active involvement of diverse social, cultural, and economic elements of the population within the service area prior to and during the preparation of the plan.	10642		1.4

56	Provide supporting documentation that the urban water supplier made the plan available for public inspection and held a public hearing about the plan. For public agencies, the hearing notice is to be provided pursuant to Section 6066 of the Government Code. The water supplier is to provide the time and place of the hearing to any city or county within which the supplier provides water. Privately-owned water suppliers shall provide an equivalent notice within its service area.	10642	1.4 App. D
57	Provide supporting documentation that the plan has been adopted as prepared or modified.	10642	1.4
58	Provide supporting documentation as to how the water supplier plans to implement its plan.	10643	1.4
59	Provide supporting documentation that, in addition to submittal to DWR, the urban water supplier has submitted this UWMP to the California State Library and any city or county within which the supplier provides water supplies a copy of its plan no later than 30 days after adoption. This also includes amendments or changes.	10644(a)	1.4
60	Provide supporting documentation that, not later than 30 days after filing a copy of its plan with the department, the urban water supplier has or will make the plan available for public review during normal business hours	10645	1.4
<b>SYSTEM DESCRIPTION</b>			
8	Describe the water supplier service area.	10631(a)	2.3

9	Describe the climate and other demographic factors of the service area of the supplier	10631(a)		2.2
10	Indicate the current population of the service area	10631(a)	Provide the most recent population data possible. Use the method described in “Baseline Daily Per Capita Water Use.” See Section M.	2.4
11	Provide population projections for 2015, 2020, 2025, and 2030, based on data from State, regional, or local service area population projections.	10631(a)	2035 and 2040 can also be provided to support consistency with Water Supply Assessments and Written Verification of Water Supply documents.	2.4
12	Describe other demographic factors affecting the supplier’s water management planning.	10631(a)		2.4
<b>SYSTEM DEMANDS</b>				
1	Provide baseline daily per capita water use, urban water use target, interim urban water use target, and compliance daily per capita water use, along with the bases for determining those estimates, including references to supporting data.	10608.20(e)		3.1
2	<i>Wholesalers:</i> Include an assessment of present and proposed future measures, programs, and policies to help achieve the water use reductions. <i>Retailers:</i> Conduct at least one public hearing that includes general discussion of the urban retail water supplier’s implementation plan for complying with the Water Conservation Bill of 2009.	10608.36 10608.26(a)	Retailers and wholesalers have slightly different requirements	1.4 3.3 App. G
3	Report progress in meeting urban water use targets using the standardized form.	10608.40	Standardized form not yet available.	N/A

25	Quantify past, current, and projected water use, identifying the uses among water use sectors, for the following: (A) single-family residential, (B) multifamily, (C) commercial, (D) industrial, (E) institutional and governmental, (F) landscape, (G) sales to other agencies, (H) saline water intrusion barriers, groundwater recharge, conjunctive use, and (I) agriculture.	10631(e)(1)	Consider ‘past’ to be 2005, present to be 2010, and projected to be 2015, 2020, 2025, and 2030. Provide numbers for each category for each of these years.	3.1
33	Provide documentation that either the retail agency provided the wholesale agency with water use projections for at least 20 years, if the UWMP agency is a retail agency, OR, if a wholesale agency, it provided its urban retail customers with future planned and existing water source available to it from the wholesale agency during the required water-year types	10631(k)	Average year, single dry year, multiple dry years for 2015, 2020, 2025, and 2030.	3.1 5.5
34	Include projected water use for single-family and multifamily residential housing needed for lower income households, as identified in the housing element of any city, county, or city and county in the service area of the supplier.	10631.1(a)		3.1
<b>SYSTEM SUPPLIES</b>				
13	Identify and quantify the existing and planned sources of water available for 2015, 2020, 2025, and 2030.	10631(b)	The ‘existing’ water sources should be for the same year as the “current population” in line 10. 2035 and 2040 can also be provided.	4.7
14	Indicate whether groundwater is an existing or planned source of water available to the supplier. If yes, then complete 15 through 21 of the UWMP Checklist. If no, then indicate “not applicable” in lines 15 through 21 under the UWMP location column.	10631(b)	Source classifications are: surface water, groundwater, recycled water, storm water, desalinated sea water, desalinated brackish groundwater, and other.	4.3

15	Indicate whether a groundwater management plan been adopted by the water supplier or if there is any other specific authorization for groundwater management. Include a copy of the plan or authorization.	10631(b)(1)		4.3
16	Describe the groundwater basin.	10631(b)(2)		4.3.2
17	Indicate whether the groundwater basin is adjudicated? Include a copy of the court order or decree.	10631(b)(2)	Groundwater Basin not Adjudicated	N/A
18	Describe the amount of groundwater the urban water supplier has the legal right to pump under the order or decree. If the basin is not adjudicated, indicate “not applicable” in the UWMP location column.	10631(b)(2)	Groundwater Basin not Adjudicated	N/A
19	For groundwater basins that are not adjudicated, provide information as to whether DWR has identified the basin or basins as overdrafted or has projected that the basin will become overdrafted if present management conditions continue, in the most current official departmental bulletin that characterizes the condition of the groundwater basin, and a detailed description of the efforts being undertaken by the urban water supplier to eliminate the long-term overdraft condition. If the basin is adjudicated, indicate “not applicable” in the UWMP location column.	10631(b)(2)		4.3.2
20	Provide a detailed description and analysis of the location, amount, and sufficiency of groundwater pumped by the urban water supplier for the past five years	10631(b)(3)		4.3.3
21	Provide a detailed description and analysis of the amount and location of groundwater that is projected to be pumped.	10631(b)(4)	Provide projections for 2015, 2020, 2025, and 2030.	4.3.3

24	Describe the opportunities for exchanges or transfers of water on a short-term or long-term basis.	10631(d)	4.4
30	Include a detailed description of all water supply projects and programs that may be undertaken by the water supplier to address water supply reliability in average, single-dry, and multiple-dry years, excluding demand management programs addressed in (f)(1). Include specific projects, describe water supply impacts, and provide a timeline for each project.	10631(h)	4.8
31	Describe desalinated water project opportunities for long-term supply, including, but not limited to, ocean water, brackish water, and groundwater.	10631(i)	4.5
44	Provide information on recycled water and its potential for use as a water source in the service area of the urban water supplier. Coordinate with local water, wastewater, groundwater, and planning agencies that operate within the supplier's service area.	10633	4.6
45	Describe the wastewater collection and treatment systems in the supplier's service area, including a quantification of the amount of wastewater collected and treated and the methods of wastewater disposal.	10633(a)	4.6.1
46	Describe the quantity of treated wastewater that meets recycled water standards, is being discharged, and is otherwise available for use in a recycled water project.	10633(b)	4.6.1 4.6.2
47	Describe the recycled water currently being used in the supplier's service area, including, but not limited to, the type, place, and quantity of use.	10633(c)	4.6.2

48	Describe and quantify the potential uses of recycled water, including, but not limited to, agricultural irrigation, landscape irrigation, wildlife habitat enhancement, wetlands, industrial reuse, groundwater recharge, indirect potable reuse, and other appropriate uses, and a determination with regard to the technical and economic feasibility of serving those uses.	10633(d)	4.6.3
49	The projected use of recycled water within the supplier's service area at the end of 5, 10, 15, and 20 years, and a description of the actual use of recycled water in comparison to uses previously projected.	10633(e)	4.7
50	Describe the actions, including financial incentives, which may be taken to encourage the use of recycled water, and the projected results of these actions in terms of acre-feet of recycled water used per year.	10633(f)	4.6.3
51	Provide a plan for optimizing the use of recycled water in the supplier's service area, including actions to facilitate the installation of dual distribution systems, to promote recirculating uses, to facilitate the increased use of treated wastewater that meets recycled water standards, and to overcome any obstacles to achieving that increased use.	10633(g)	4.6.3
<b>WATER SHORTAGE RELIABILITY AND WATER SHORTAGE CONTINGENCY PLANNING <sup>b</sup></b>			
5	Describe water management tools and options to maximize resources and minimize the need to import water from other regions.	10620(f)	Chapter 5

22	Describe the reliability of the water supply and vulnerability to seasonal or climatic shortage and provide data for (A) an average water year, (B) a single dry water year, and (C) multiple dry water years.	10631(c)(1)	5.5
23	For any water source that may not be available at a consistent level of use - given specific legal, environmental, water quality, or climatic factors - describe plans to supplement or replace that source with alternative sources or water demand management measures, to the extent practicable.	10631(c)(2)	5.2 5.5.1
35	Provide an urban water shortage contingency analysis that specifies stages of action, including up to a 50-percent water supply reduction, and an outline of specific water supply conditions at each stage	10632(a)	5.3.3
36	Provide an estimate of the minimum water supply available during each of the next three water years based on the driest three-year historic sequence for the agency's water supply.	10632(b)	5.5
37	Identify actions to be undertaken by the urban water supplier to prepare for, and implement during, a catastrophic interruption of water supplies including, but not limited to, a regional power outage, an earthquake, or other disaster.	10632(c)	5.3.1
38	Identify additional, mandatory prohibitions against specific water use practices during water shortages, including, but not limited to, prohibiting the use of potable water for street cleaning.	10632(d)	5.3.2

39	Specify consumption reduction methods in the most restrictive stages. Each urban water supplier may use any type of consumption reduction methods in its water shortage contingency analysis that would reduce water use, are appropriate for its area, and have the ability to achieve a water use reduction consistent with up to a 50 percent reduction in water supply.	10632(e)		5.3.2
40	Indicated penalties or charges for excessive use, where applicable.	10632(f)		5.3.4
41	Provide an analysis of the impacts of each of the actions and conditions described in subdivisions (a) to (f), inclusive, on the revenues and expenditures of the urban water supplier, and proposed measures to overcome those impacts, such as the development of reserves and rate adjustments.	10632(g)		5.3.5
42	Provide a draft water shortage contingency resolution or ordinance.	10632(h)		5.3.2 App. H
43	Indicate a mechanism for determining actual reductions in water use pursuant to the urban water shortage contingency analysis.	10632(i)		5.6
52	Provide information, to the extent practicable, relating to the quality of existing sources of water available to the supplier over the same five-year increments, and the manner in which water quality affects water management strategies and supply reliability	10634	For years 2010, 2015, 2020, 2025, and 2030	5.4

53	Assess the water supply reliability during normal, dry, and multiple dry water years by comparing the total water supply sources available to the water supplier with the total projected water use over the next 20 years, in five-year increments, for a normal water year, a single dry water year, and multiple dry water years. Base the assessment on the information compiled under Section 10631, including available data from state, regional, or local agency population projections within the service area of the urban water supplier.	10635(a)		5.5
<b>DEMAND MANAGEMENT MEASURES</b>				
26	Describe how each water demand management measure is being implemented or scheduled for implementation. Use the list provided.	10631(f)(1)	Discuss each DMM, even if it is not currently or planned for implementation. Provide any appropriate schedules.	Chapter 6
27	Describe the methods the supplier uses to evaluate the effectiveness of DMMs implemented or described in the UWMP.	10631(f)(3)		6.15
28	Provide an estimate, if available, of existing conservation savings on water use within the supplier's service area, and the effect of the savings on the ability to further reduce demand.	10631(f)(4)		6.16
29	Evaluate each water demand management measure that is not currently being implemented or scheduled for implementation. The evaluation should include economic and non-economic factors, cost-benefit analysis, available funding, and the water suppliers' legal authority to implement the work.	10631(g)	See 10631(g) for additional wording.	Chapter 6

---

32	Include the annual reports submitted to meet the Section 6.2 requirements, if a member of the CUWCC and signer of the December 10, 2008 MOU.	10631(j)	Signers of the MOU that submit the annual reports are deemed compliant with Items 28 and 29.	N/A
----	--	----------	--	-----

---

- a The UWMP Requirement descriptions are general summaries of what is provided in the legislation. Urban water suppliers should review the exact legislative wording prior to submitting its UWMP.
- b The Subject classification is provided for clarification only. It is aligned with the organization presented in Part I of this guidebook. A water supplier is free to address the UWMP Requirement anywhere with its UWMP, but is urged to provide clarification to DWR to facilitate review.

## Appendix C Public Agency Notifications

---

## Appendix D Public Notices

---

## Appendix E Resolution for Adoption

---

## **Appendix F Land Use Agencies' Growth Projections**

---

## Appendix G Agency Water Conservation Plan

---

## Appendix H Agency Water Code

---

**Appendix I      Public Water System Statistic, Department of  
Water Resources (1994-2010) for Tanner, Ione,  
CAWP, La Mel & Camanche**

---

## **Appendix J Amador Water Agency Emergency Handbook**

---

## Appendix K Additional Spreadsheets

---