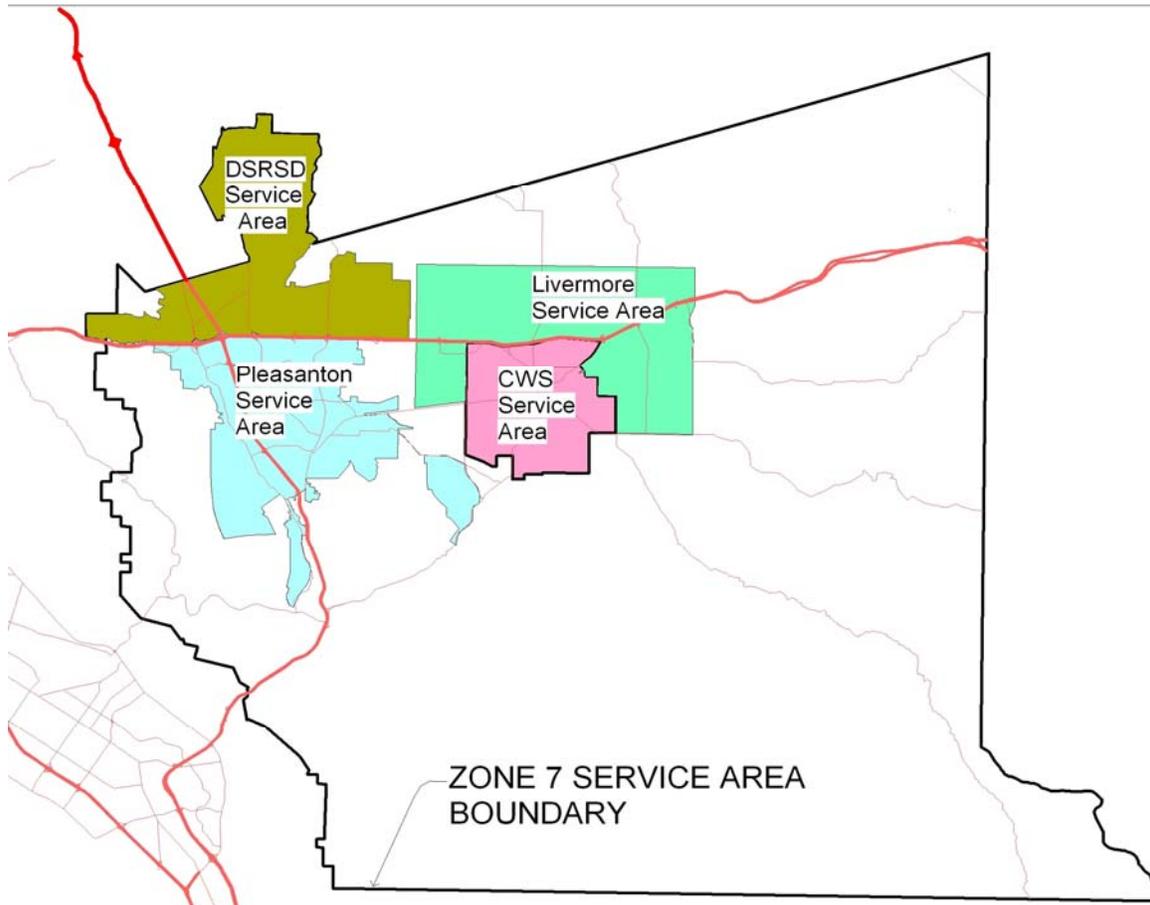


**Appendix K: Zone 7 Urban Water Management Plan**

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# URBAN WATER MANAGEMENT & WATER SHORTAGE CONTINGENCY PLAN



**Zone 7 Water Agency**

**2005 Update**

**September 2005**

**Conformed – October 20, 2005**

*Prepared by: Zone 7 Staff*

# Urban Water Management and Water Shortage Contingency Plan - 2005

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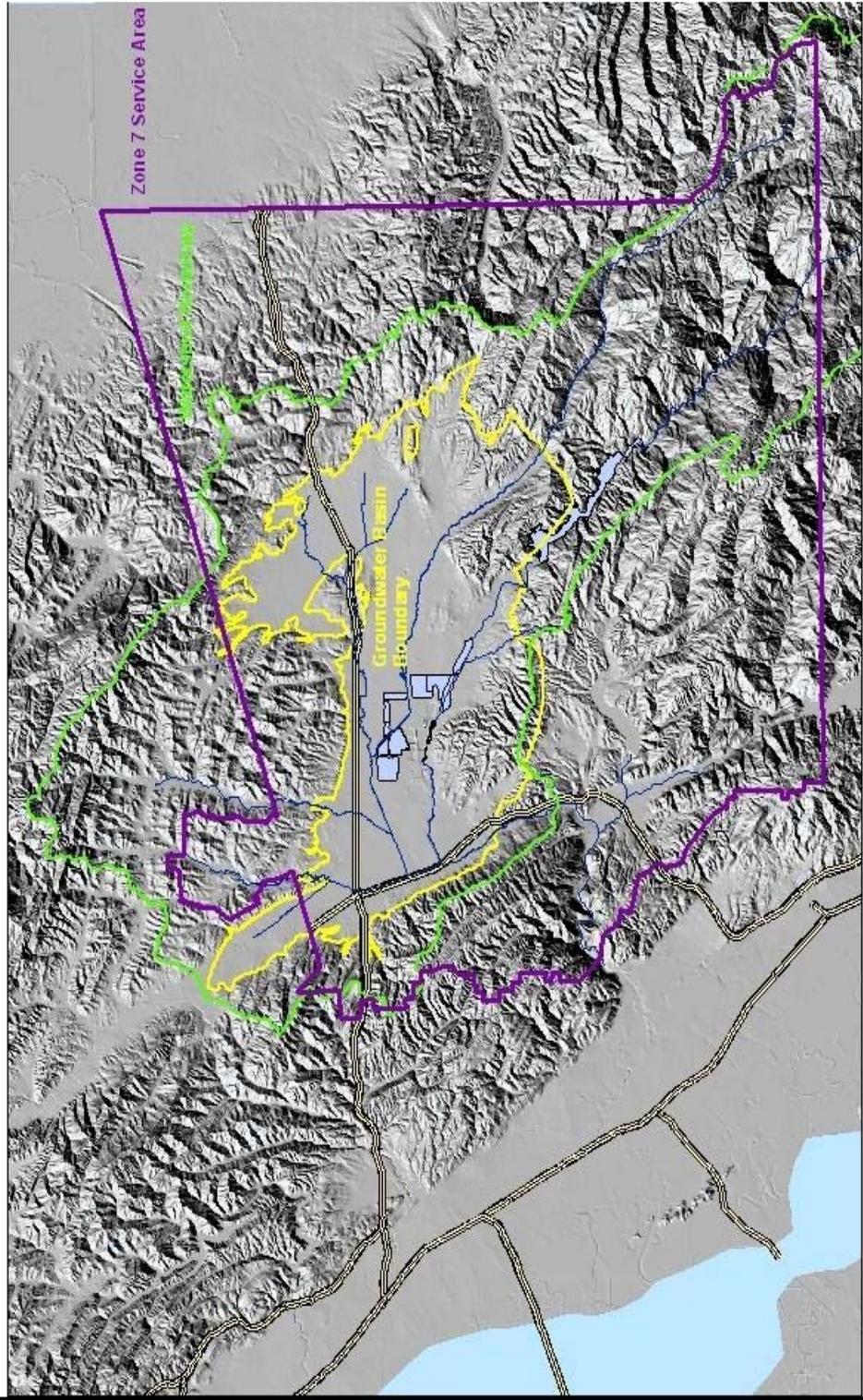
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Wholesale Water Supplier  
State Water Project Contractor

Zone 7 Water Agency is committed to providing a reliable supply of high quality water and an effective flood control system to the Livermore-Amador Valley. In fulfilling our present and future commitments to the community, we will develop and manage the water resources in a fiscally responsible, innovative, proactive, and environmentally sensitive way.

# Livermore-Amador Valley



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## **1.0 INTRODUCTION**

This Urban Water Management and Drought Shortage Contingency Plan (UWMP or Plan) has been prepared in response to the Urban Water Management Planning Act (Act), California Water Code Sections 10610 through 10650. The Act was adopted by the California Legislature as Assembly Bill 797 during the 1983-84 session and signed into law by Governor Deukmejian on January 1, 1984. The Act requires that “every urban water supplier shall prepare and adopt an Urban Water Management Plan.” Urban water supplier is defined as “a supplier, either publicly or privately owned, providing water for municipal purposes either directly or indirectly to more than 3,000 customers or supplying more than 3,000 acre-feet of water annually.” Under this definition, Zone 7 Water Agency and each of the four retail water supply agencies which it serves (City of Pleasanton, City of Livermore, Dublin-San Ramon Services District and California Water Service Company) are all urban water suppliers.

The Act has been amended several times since it was first signed into law in 1984. For instance, Assembly Bill (AB) 2853, passed in 1994, requires the UWMP to examine recycled water as a potential water source. Another amendment, AB 1845 (passed in 1995), mandates every urban water supplier to include, as part of its UWMP, a prescribed assessment of the reliability of its water supply for its customers during normal, dry, and critically dry water runoff years.

Zone 7 adopted its first UWMP in 1985. An updated UWMP, prepared by Zone 7 in cooperation with, and for, the Dublin San Ramon Services District (DSRSD), the City of Livermore, and the City of Pleasanton, was adopted in 1991. An Urban Water Shortage Contingency Plan was prepared in January 1992 to comply with the October, 1991 amendment to the Water Code. Zone 7 Water Agency adopted its most recent UWMP update in October 2000.

This 2005 UWMP represents an update of the earlier Plans. Zone 7 is almost exclusively a water wholesaler providing potable water for municipal uses indirectly through retail urban water suppliers, although it does provide treated water to a very small number of retail customers (significantly less than 3,000 service connections and only about 750 acre-feet annually). Since Zone 7 is primarily a water wholesaler, this UWMP addresses issues of water demand, supplies, and management on a general basis but does not include information on behalf of the retail water supply agencies. Urban Water Management Plans submitted by Zone 7's retail water supply agency customers (Dublin San Ramon Services District, California Water Services Company, and the Cities of Livermore and Pleasanton) are expected to provide more detailed information about these issues at the consumer level. Urban Water Management Plans are to be adopted by each urban water supplier and submitted to the Department of Water Resources by December 31, 2005.

The California Environmental Quality Act (CEQA) does not apply to the preparation and adoption of Urban Water Management Plans (Water Code Section 10652).

Zone 7's UWMP includes a broad overview of its service area and operational facilities, as well as a general description of Livermore-Amador Valley's water conservation, water recycling, and water supply and demand management activities. Being almost exclusively a water wholesaler, Zone 7 coordinates its water conservation efforts with its retail water supply agencies. As such, this UWMP will focus on Zone 7 activities and will not include a description of individual retailer conservation programs, since each

retailing agency is an urban water supplier and will each prepare its own urban water management plan. Similarly, details of recycled water treatment and distribution are left to the UWMP's of the two urban water suppliers who perform these tasks in the area.

This UWMP addresses all Water Code requirements for such a plan. The following is a road map to where each Water Code requirement is addressed in the UWMP (in the order of the referenced Water Code Section).

Table 1.1: UWMP Road Map and Checklist

<i>Water Code Section</i>	<i>Chapter</i>	<i>Section</i>	<i>Content Description</i>
10620(d)	3.0		Agency Coordination
10620 (f)		3.1	Resource Maximization / Import Minimization Plan
10621 (a)	1.0		Updated Plan in Years Ending in Five and Zero
10621 (b)	4.0		City and County Notification and Participation
10631(a)	2.0	2.1, 2.2, 2.3, 2.4	Service Area Information
10631(b)	5.0	5.1, 5.2, 5.3, 5.4, 5.5	Water Sources
10631(b) (1)-(4)	6.0		Water Sources - Groundwater
10631(c) (1-3)	7.0	7.1, 7.2, 7.3	Reliability of Supply Sources
10631(d)	8.0	8.1, 8.2,	Transfer & Exchange Opportunities
10631(e) (1) (2) (3)	9.0		Water Use By Customer Type
10631(f)(1) (2) (3) (4)	10.0		Demand Management Measures (DMMs)
10631 (g)	8.0, 10.1, 11.0	Table 8, Table 14	Planned Water Supply Projects & Programs, including non-implemented DMMs
10631(h)	8.0, 10.1, 11.0	Table 8, Table 14	Planned Water Supply Projects and Programs
10631(i)	12.0		Opportunities for Development of Desalinated Water
10631 (j)	10.0	10.1	Zone 7 Water Agency is not a CUWCC Member
10631 (k)		5.6	Zone 7 Water Agency is a Wholesaler

<i>Water Code Section</i>	<i>Chapter</i>	<i>Section</i>	<i>Content Description</i>
10631.5	10.2		Determination of DMM Implementation
10632(a)	13.0	13.1	Water Shortage Contingency Stages of Action
10632(b)		13.2	Three-Year Minimum Water Supply
10632(c)		13.3	Preparation for Catastrophic Water Supply Interruption
10632(d)		13.4	Prohibitions against specific water use practices during water shortages
10632 (e)		13.6	Consumption Reduction Methods
10632 (f)		13.6	Excessive use penalties or charges for excessive use
10632(g)		13.5	Revenue and Expenditure Impacts
10632 (h)	13.0	Appendix D	Water Shortage Contingency Ordinance/Resolution
10632(i)		13.6	Reduction Measuring Mechanism
10633	14.0		Recycled Water Agency Plan
10633 (a)	14.0		Description of Wastewater System
10633		14.1	Recycled Water Plan Coordination
10633(a-d)		14.2	Wastewater Disposal and Current Use
10633(e)		14.3	Projected Uses of Recycled Water
10633 (f)	14.0	14.3	Plan to Optimize Use of Recycled Water
10634	15.0		Water Quality Impacts on Availability of Supply
10635(a)	16.0		Water Service Reliability – Normal, Dry, and Multiple Dry Years
10635 (b)	16.0		Provision of Water Service Reliability Section to Cities/ Counties Within Service Area
10642	4.0		Public Participation
10643	10.0		Review of Implementation of 2000 UWMP
10644 (a)	4.0		Provision of 2005 UWMP to Local Governments

<i>Water Code Section</i>	<i>Chapter</i>	<i>Section</i>	<i>Content Description</i>
10645	4.0		Places Where UWMP is Available For Public Review
10656, 10657	17.0		UWMP Adoption & Implementation

## **2.0 GENERAL SERVICE AREA INFORMATION**

*Water Code*

*Section 10631.*

*A plan shall be adopted in accordance with this chapter and shall do all of the following:*

*(a) Describe the service area of the supplier, including current and projected population, climate, and other demographic factors affecting the supplier's water management planning. The projected population estimates shall be based upon data from the state, regional, or local service agency population projections within the service area of the urban water supplier and shall be in 5-year increments to 20 years or as far as data is available.*

### **2.1 Overview**

Zone 7 of Alameda County Flood Control and Water Conservation District (Zone 7) is one of ten active zones of the Alameda County Flood Control and Water Conservation District (District). The District was created in 1949 by the State legislature through passage of Act 205 of the California Uncodified Water Code (District Act). The District was formed to provide control of flood and storm waters and to conserve water for beneficial uses.

In addition, the District is vested with the power to store water in surface or underground reservoirs within or outside of the District for the common benefit of the District; to conserve and reclaim water for present and future use within the District; to appropriate and acquire water and water rights and to import water into the District. The District is further authorized by the District Act to prevent interference with or diminution of, or to declare rights in the natural flow of any stream or surface or subterranean supply of waters used or useful for any purpose of the district and to prevent contamination, pollution or otherwise rendering unfit for beneficial use the surface or subsurface water used or useful in the district. The District is also authorized to levy replenishment assessments upon the production of groundwater from all water-producing facilities, whether public or private, within the District.

Zone 7, also known as the Zone 7 Water Agency, covers the eastern portion of Alameda County which includes the cities of Dublin, Pleasanton and Livermore, also known as the Livermore-Amador Valley. Pursuant to Section 36 of the District Act, Zone 7 was established in 1957 to address regional and water supply issues. Zone 7 is governed by an elected seven member board of directors who, with the passage of AB 1125 in 2003, have full authority and autonomy to govern matters solely affecting Zone 7 independent of the Alameda County Board of Supervisors (who solely govern the other nine zones of

the District). The seven directors are elected at large by the residents of Zone 7. Each director serves a four-year term. The Zone 7 Board sets policy and provides direction to agency management and staff. The figure on the cover of this Plan shows the Zone 7 Water Agency service area as well as the service areas for the four major water retail supply agencies (Dublin San Ramon Services District, California Water Services Company, and the Cities of Livermore and Pleasanton).

Zone 7 imports surface water from the State Water Project (SWP) through the South Bay Aqueduct (SBA) for treatment, storage, and recharge. As one of the 29 state water contractors, Zone 7 is the water wholesaler for the Tri-Valley Area (Dublin, Pleasanton and Livermore; also known as the Livermore-Amador Valley), in addition to serving as the area's flood control agency. Zone 7 Water Agency supplies treated drinking water to four retail water supply agencies: Dublin San Ramon Services District, the City of Pleasanton, the City of Livermore, and California Water Service Company. These water retailers deliver water to homes in their individual service areas.

The four water supply retail agencies entered into an agreement titled the "Tri-Valley Water Retailers Cooperation Agreement." The Tri-Valley Water Retailers Group (TWRG) is the name of the staff committee from each water supply retail agency that administers the agreement and provides continuity between the annual meetings of the Committee of Valley Water Retailers (CoVWR) that is called for in the Agreement. The CoVWR and the TWRG serve as forums for the retailers to discuss issues of common interest. Zone 7 also supplies untreated water for local industry and agriculture. Thus, Zone 7 indirectly serves water to an area with a population of approximately 190,000 people.

Zone 7 is also the overall water quality management agency for the Alameda Creek Watershed above Niles. Zone 7's water resource management responsibilities include providing a wholesale treated drinking water supply; monitoring and protecting water quality; operating and maintaining a water treatment system; and managing flood and storm water for public safety and protection of property.

Zone 7 operates two water treatment plants, Del Valle and Patterson Pass, as well as a total of seven wells located in three well fields. Total surface water treatment design capacity is 55 million gallons per day (MGD) while the wells have a total peak capacity of 32 MGD. Surface water accounts for approximately 70% of regional needs. Zone 7 also manages the conveyance system required to insure proper distribution of the potable water supply to the retail water supply agencies.

One of the most important tasks Zone 7 performs is administering oversight of the local groundwater basin. In this capacity, Zone 7 monitors groundwater extractions and imports water to both artificially recharge the Main Groundwater Basin underlying the Livermore-Amador Valley (to supplement natural recharge) and to provide potable water through direct treatment (thus allowing local agencies to reduce pumping demands on the Main Basin). Zone 7's Groundwater Management Program prevents groundwater overdraft in this manner and the Groundwater Management Plan, which summarizes the program's components, is incorporated herein by reference.

The history of Zone 7 as a water resource management agency can be traced to the mid-1950's. At that time, the Livermore-Amador Valley was primarily rural in character, with a population of approximately 30,000. The area also faced a number of problems, including groundwater overdraft, poor drainage and flood hazards, and an uncertainty

over the status of future water supplies. It was against this backdrop that the residents of the Valley voted, in 1957, to create Zone 7.

## **2.2 Service Area**

Zone 7 Water Agency's service area encompasses 425 square miles of the Livermore-Amador Valley, Sunol Valley, and portions of the Diablo Range. The service area's boundary extends to include the entire eastern portion of Alameda County. Zone 7's service area includes about 190,000 residents of the cities of Dublin, Livermore, and Pleasanton and the surrounding unincorporated areas. This vibrant and rapidly growing region, located about 40 miles south-east of San Francisco, is home to a myriad of vital and dynamic economic enterprises. The area's largest employer, with almost 9,000 employees, is the Lawrence Livermore National Laboratory, located, along with Sandia National Labs, in the eastern end of the Livermore-Amador Valley. In the eastern reaches of the Valley can also be found oil wells and acres of energy generating windmills. High tech corporations like Oracle and AT&T are based in Pleasanton, headquartered in an area that a hundred years ago was marshy swamp land. Pleasanton is also home base for Safeway Stores, one of the largest food chains in North America with over 1,800 stores in the U.S. and Canada. Other large Tri-Valley employers include AT&T, Provident Financial, Sybase, and E-Loan. This is also an up and coming wine region, supporting a number of award winning wineries.

Zone 7's service area lies within the Alameda Creek Watershed. The Watershed encompasses almost 700 square miles and extends from Altamont Pass in the east to the San Francisco Bay in Union City on the west, and from Mount Diablo on the north to Mount Hamilton on the south (see Figure 1).

Major streams in Zone 7's service area include the Arroyo Valle, Arroyo Mocho, Arroyo Las Positas, Alamo Canal, and South San Ramon and Tassajara Creeks. Both the Arroyo Valle and Arroyo Mocho originate in the woodland forests of the Burnt Hills region in Santa Clara County, in the watershed above Lake Del Valle. The Arroyo Valle and Arroyo Mocho have the largest drainage areas within the Zone 7 service area.

The Arroyo Valle flows into Lake Del Valle above Lang Canyon. It continues its journey below the Del Valle Dam and flows westerly through a regional park on the southern border of Livermore and reaches Pleasanton. The Arroyo Valle then flows southwestly through the historic downtown region of Pleasanton and joins the Arroyo de la Laguna.

The Arroyo Mocho remains a natural waterway as it flows southwest through the oak woodlands east of Livermore. It then flows through the southern portion of Livermore, then goes through the gravel mining area west of the city where it meets the Arroyo Las Positas in Pleasanton. This stream is also a major component of Zone 7's groundwater recharge program. Zone 7 releases water into both it and the Arroyo Valle for aesthetic and environmental as well as groundwater recharge purposes.

The Arroyo Las Positas mainly flows westerly along I-580. The major tributaries of the Arroyo Las Positas include the Arroyo Seco, Altamont Creek, Cayetano Creek, Collier Canyon Creek, and Cottonwood Creek

In northeast Pleasanton, the Arroyo Las Positas joins the Arroyo Mocho. At this point, the streambed becomes a wide, trapezoidal-shaped flood control channel. The Arroyo Mocho then flows into the Arroyo de la Laguna, which is a tributary of Alameda Creek.

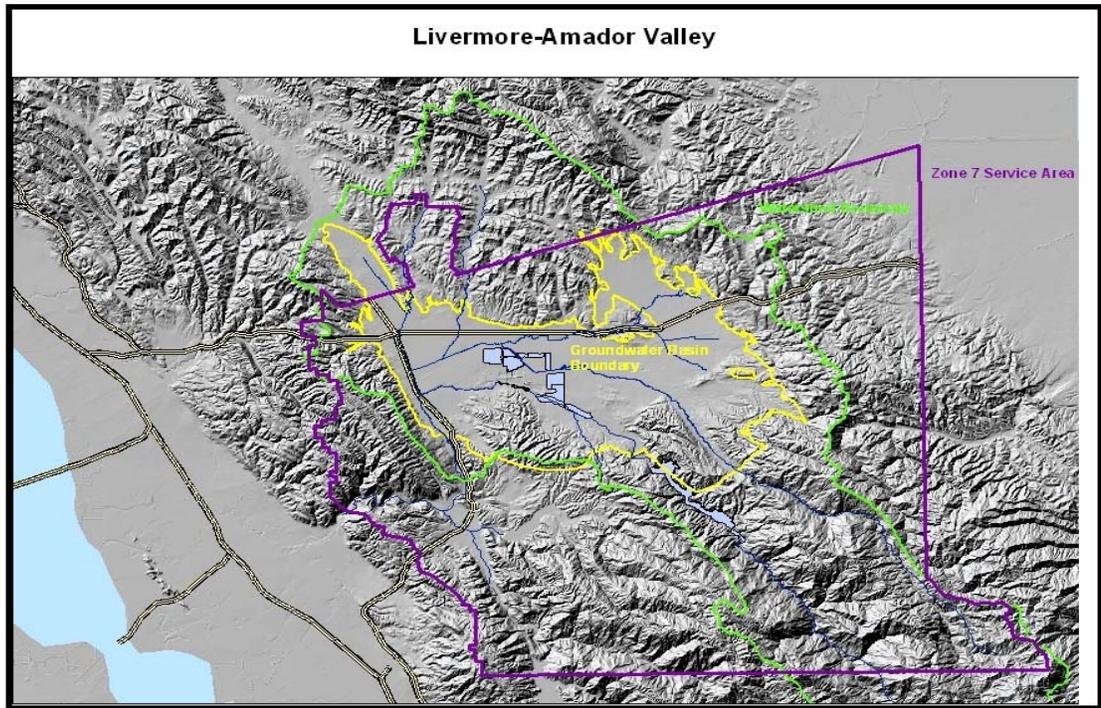


Figure 1. Zone 7 Service Area, Watershed Boundary, and Groundwater Basin

### **2.3 Population Growth**

Due to the extreme popularity of this area, population growth has risen at an accelerated pace. Since 1985, Zone 7’s service area population has almost doubled in size, growing from about 105,000 in 1985 to a present day level of approximately 196,000 (including Dougherty Valley residents) projected by year end. The current and projected population served by Zone 7 is shown in Table 1.

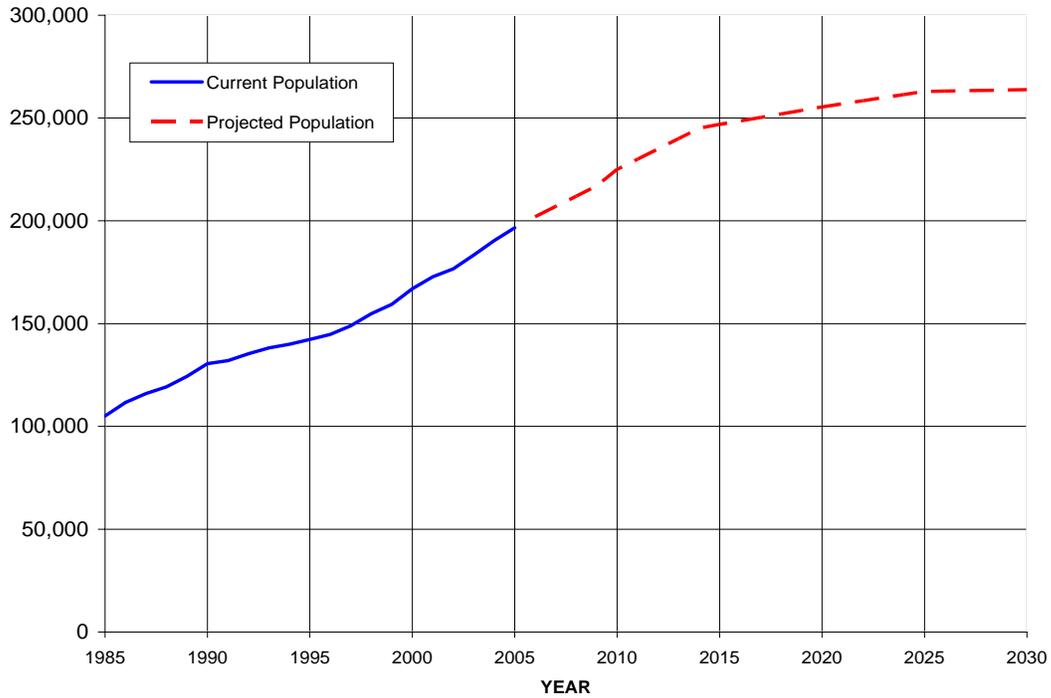
Table 1. Population.

(Source: Zone 7 Annual Review of the Sustainable Water Supply – July Update; 2005 Population estimate from CA. Dept of Finance Demographic Research Unit)

	2005	2010	2015	2020	2025	2030
Population Served by Zone 7 *	196,000	225,000	247,000	255,000	263,000	264,000

\* Year-end projections. Includes Dougherty Valley.

**ZONE 7 SERVICE AREA POPULATION**



*Figure 2. Zone 7 Service Area Population – Current and Projected.*

**2.4 Climate**

The climate is best described as Mediterranean, characterized by hot, dry summers and cool, moist winters. Annual precipitation in the region varies from 24 to 28 inches in the western portions of the Livermore-Amador Valley to approximately 14 inches in the more arid, eastern locations. A more detailed listing of relevant weather parameters can be found in Table 2 and viewed graphically as Figure 3.

**Table 2. Monthly & Annual Averages for ETo, Temperature, & Rainfall.**

Month	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	July	Aug	Sep	Annual Avg.
<b>Total ETo (in)</b>	2.95	1.84	1.51	1.18	1.65	4.17	4.78	5.68	6.64	7.29	6.26	5.05	4.08
<b>Avg. Temp (°F)</b>	58.7	51.1	47.8	45.2	51.7	55.5	54.9	61.3	63.6	68.8	69.4	67.7	58.0
<b>Avg Rainfall (in)</b>	0.77	2.21	3.79	4.32	4.25	2.92	1.19	0.85	0.12	0.00	0.05	0.16	1.72

### Livermore-Amador Valley Climatologic Data

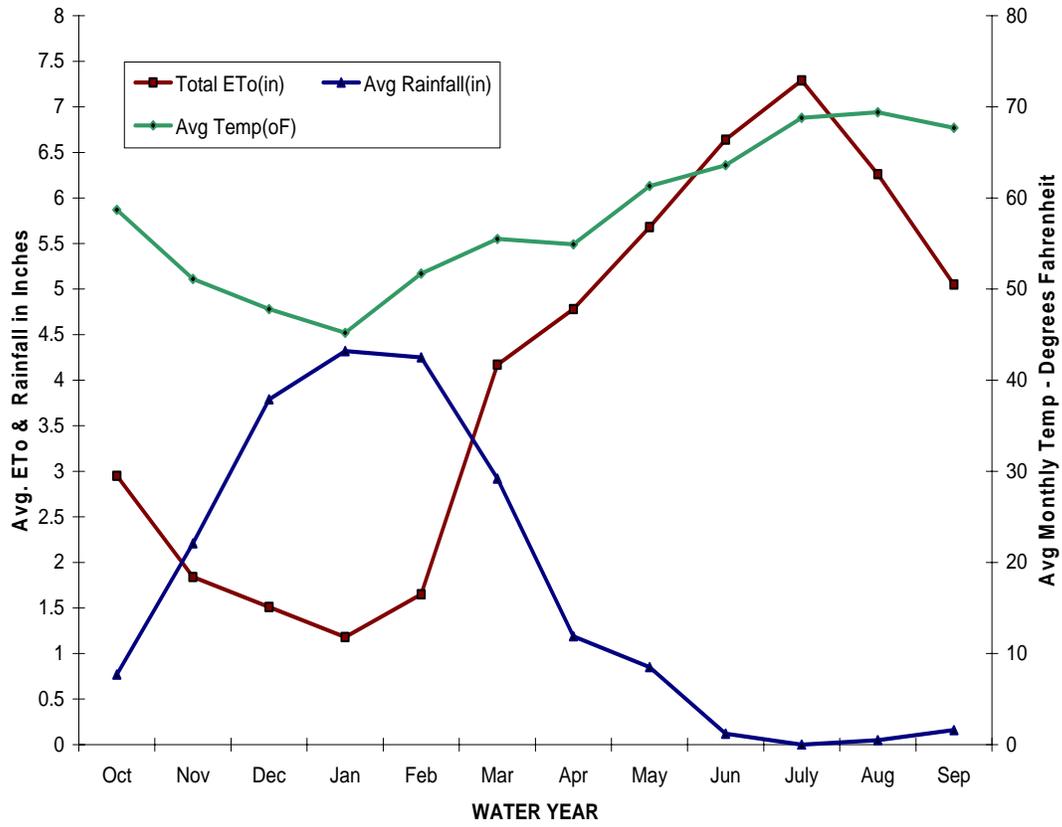


Figure 3. Livermore-Amador Valley Climatologic Averages

Average rainfall for Pleasanton is depicted in the graph in Figure 4.

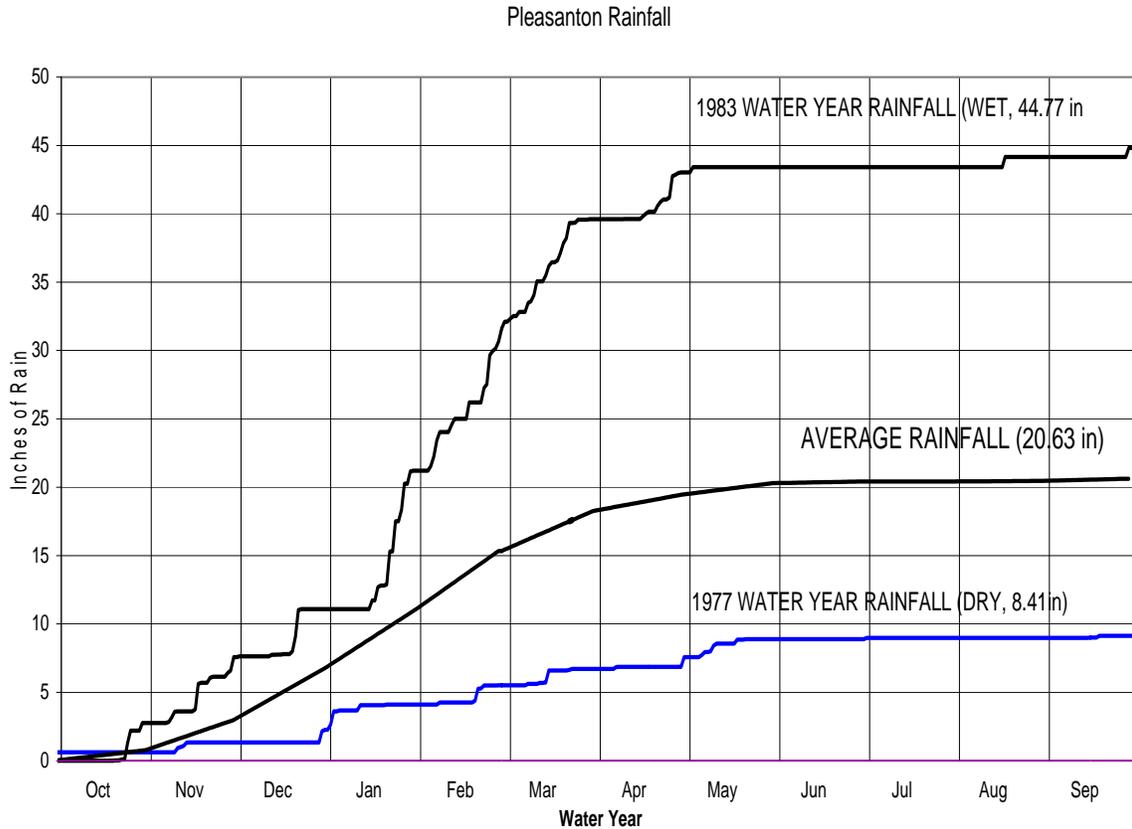


Figure 4. Pleasanton Rainfall.

### **3.0 AGENCY COORDINATION**

Water Code

*Section 10620*

*(d) (2) Each urban water supplier shall coordinate the preparation of its plan with other appropriate agencies in the area, including other water suppliers that share a common source, water management agencies, and relevant public agencies, to the extent possible.*

Zone 7 Water Agency serves the cities of Dublin, Livermore, and Pleasanton through the four retail water suppliers: Dublin-San Ramon Services District, City of Pleasanton, City of Livermore, and California Water Service Company. Zone 7 and two of the four retail water suppliers operate municipal supply wells which pump from a common groundwater basin. In addition, Zone 7 imports State Water Project water and treats it at surface water treatment facilities, along with local runoff captured and stored in Del Valle Reservoir. Zone 7 also maintains groundwater levels by artificially recharging through controlled releases of surface water supplies. These agency relationships are set forth in retail water supply contracts.

As a first step in the preparation of the 2005 UWMP, Zone 7 held a kick-off meeting with technical staff from its water retailers. The purpose of the kick-off meeting was to establish lines of communication to ensure the efficient and timely transfer of relevant data needed to complete the UWMP. Zone 7 will continue to work closely with its retail water agencies and untreated water customers in the development and implementation of the respective water conservation and water management programs. As the wholesale water supplier to the Tri-Valley, Zone 7 has notified the cities within the service area of the opportunity to submit comments regarding the 2005 UWMP. As a special agency within the county structure, Zone 7 has similarly coordinated with other departments within the county, as well as the Alameda County Local Agency Formation Commission.

To improve the coordination of water supply planning, Zone 7 conducts an annual review of the Sustainable Water Supply, publishes the results, and discusses the management strategies. This process is conducted annually and is vetted in a number of forums including public presentations to the Zone 7 Board, presentations and discussion with the TWRG, and publishing of the report on the web.

The process of reviewing the Sustainable Supply on an annual basis makes the preparation of the water supply portion of the UWMP more of a reporting function. It also assures the water supply retail agencies and the community that the UWMP will not contain surprises. Zone 7 believes that this process makes its water management plans more responsive to community needs and more open to public review.

Table 3 lists the various organizations that were contacted. In addition, a public presentation was provided at the regular public meeting of the Zone 7 Water Agency Board held on August 17, 2005 to summarize the Draft UWMP. Table 3 also summarizes circulation of the Draft UWMP. The Draft UWMP was sent to the listed organizations with a request to provide comments.

Zone 7 Water Agency is also actively involved with the State Water Project Water Budget process and routinely communicates to its retail water supply agencies any drought related variability in the water supply availability. Throughout the year, Zone 7 holds regularly scheduled meetings with technical staff from each of its retailers.

Table 3. Agency Coordination.

ENTITY	TYPE	UWMP AUTHOR	PARTICIPATED IN DEVELOPING PLAN *	COMMENTED ON DRAFT	ATTENDED PUBLIC MEETINGS	WAS CONTACTED FOR ASSISTANCE	RECEIVED COPY OF DRAFT	SENT NOTICE OF INTENTION TO ADOPT
Zone 7 Water Agency	Water Mgt. Agency	X	X			X		
Alameda County Planning Dept.	Relevant Public Entity						X	
Alameda County Public Library - Dublin Branch							X	
California Water Services Company	Water Supplier		X			X	X	X
City of Dublin - Planning Dept.	Relevant Public Entity						X	
Dublin San Ramon Services District - DSRSD	Water Supplier/Wastewater Mgt. Agency		X	X	X	X	X	X
Livermore Amador Valley Water Mgt. Agency (LAVWMA)	Wastewater Mgt. Agency						X	
City of Livermore - Water Resources Division	Water, Wastewater, Stormwater Utility		X	X	X	X	X	X
City of Livermore Public Library							X	
City of Pleasanton - Public Works Dept	Water Supplier		X		X	X	X	X
City of Pleasanton - Public Library							X	

\* Workshop - August 3, 2005; received review copy of July 2005 Administrative Draft

### **3.1 Maximize Resources & Minimize Need to Import Water**

*Water Code*

*Section 10620. (2)*

*(f) An urban water supplier shall describe in the plan water management tools and options used by that entity that will maximize resources and minimize the need to import from other regions.*

This 2005 update of Zone 7 Water Agency’s UWMP describes how the agency uses its groundwater basin conjunctively for emergency drought storage (explained in more detail in the Groundwater Management Plan, incorporated herein by reference), local runoff stored in Lake Del Valle, and groundwater stored out of the area, to minimize the need for imported State Water Project water (see Section 5.0 below). Zone 7 is capable of

providing 100% of its contracted water obligations even in the event of the worst case multi-year drought. Doing so requires drawdown of the groundwater basin and pumpback from the Semitropic Water Storage District (see Section 7.2). To the extent that conservation can reduce demand during a drought, the groundwater basin and pumpback from Semitropic, can sustain the Valley for even longer periods than it could under a 100% demand scenario.

#### **4.0 PUBLIC PARTICIPATION**

*Water Code*

*Section 10642.*

*Each urban water supplier shall encourage the active involvement of diverse social, cultural, and economic elements of the population within the service area prior to and during the preparation of the plan. Prior to adopting a plan, the urban water supplier shall make the plan available for public inspection and shall hold a public hearing thereon. Prior to the hearing, notice of the time and place of hearing shall be published within the jurisdiction of the publicly owned water supplier pursuant to Section 6066 of the Government Code. A privately owned water supplier shall provide an equivalent notice within its service area. After the hearing, the plan shall be adopted as prepared or as modified after the hearing.*

Zone 7 Water Agency complied with this provision by allowing any interested member of the general community to have access to the draft UWMP. An overview of the UWMP was presented at the August 17, 2005 public meeting of the Zone 7 Board of Directors. This signified the opening of the public comment period. The Draft Plan was then made available for public inspection at local libraries, as well as on Zone 7's website. In addition, Zone 7 had a copy of the draft UWMP available for public review at the Zone 7 Administrative Office in Livermore. Draft copies were sent for review and comment to all Zone 7 retail water supply agencies, wastewater agencies, cities, and special interest groups before the public hearing. Public notices regarding the availability of the UWMP for public inspection were posted in the local newspapers and on the Zone 7 website. A public hearing is planned for September 21, 2005 to allow public comment about the UWMP before being adopted by the Zone 7 Board of Directors.

On September 21, 2005 the Zone 7 Water Agency Urban Water Management Plan 2005 Update will most likely be adopted by the Zone 7 Board of Directors at its regularly scheduled meeting. A copy of the Board resolution adopting the UWMP is attached as Appendix A.

## **5.0 WATER SOURCES**

### *Water Code*

#### *Section 10631.*

*A plan shall be adopted in accordance with this chapter and shall do all of the following:*

*(b) Identify and quantify, to the extent practicable, the existing and planned sources of water available to the supplier over the same 5-year increments [to 20 years or as far as data is available.]*

Zone 7's sources of water supply available to meet demands can be grouped into five categories: 1) the Livermore-Amador Valley groundwater basin; 2) water transfers (out-of-basin storage options discussed in Chapter 8, below); 3) imported supplies; 4) locally conserved water in Lake Del Valle; and 5) recycled water. Existing and planned uses are described for each category in more detail below.

### **5.1 The Livermore-Amador Valley Groundwater Basin**

The Livermore-Amador Valley overlies a Main Groundwater Basin (Main Basin) that covers an area of over 17,000 acres and has an estimated storage capacity from 240,000 to 250,000 acre-feet. Detailed discussions of the Main Basin are available in the Groundwater Management Plan, incorporated herein by reference. DWR has not identified the Main Basin (DWR Basin No. 2-10) as either a basin in overdraft or a basin expected to be in overdraft.

The Main Basin is characterized by relatively good quality groundwater that meets all state and federal drinking water standards with only minimal treatment (chloramination to preserve quality in the distribution system). At one time, in the days before the construction of the State Water Project, groundwater was the sole water source for the Livermore-Amador Valley. This resource has gone through several periods of extended withdrawal and subsequent recovery. In the 1960's, when approximately 110,000 acre-feet of groundwater was extracted, the Main Basin reached its historic low of 130,000 acre-feet remaining in storage. The more significant recovery period was from 1962 to 1983. It was during this era that Zone 7 first conducted a program of groundwater replenishment by recharging imported surface water in its streams for storage in the Main Basin, began supplying treated surface water to augment groundwater supplies, and regulating municipal pumping by contractually establishing Independent Quotas (IQ).

Currently, Zone 7 manages the Main Basin so that under non-emergency conditions, including several multi-year droughts, groundwater elevations do not drop below historic low levels. Again, this is described in more detail in Zone 7's "Groundwater Management Plan" (incorporated herein by reference).

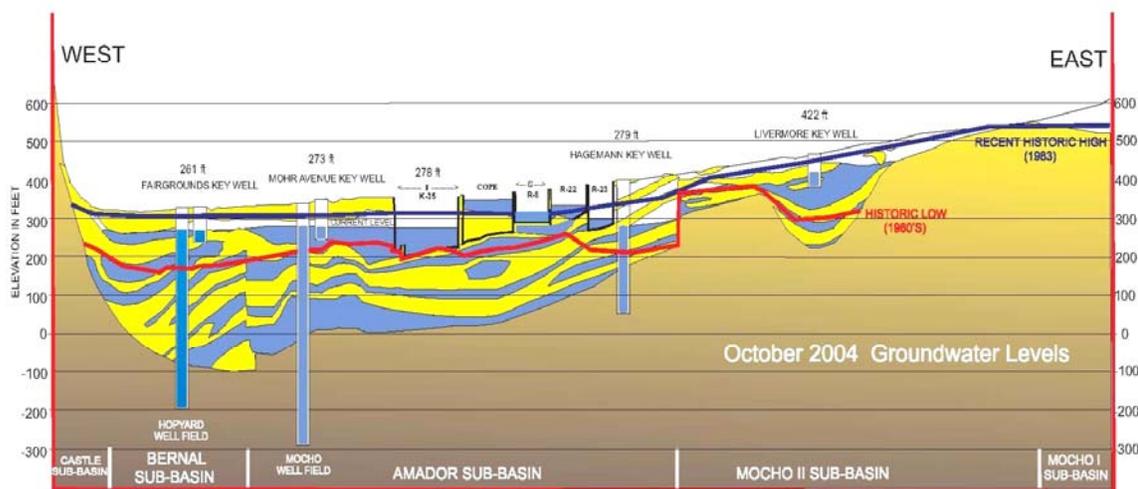
Zone 7 operates the groundwater basin to maximize conjunctive use of regional water supplies. Zone 7's present operational plan is to maintain about 130,000 acre-feet (i.e. the historic low level) of extreme emergency storage at all times, even after a prolonged drought. Zone 7's typical operational plans call for seasonal storage of 15,000 to 20,000 acre-feet of water within the groundwater basin and the maintenance of about 110,000 acre-feet for drought storage. This amount is sufficient (when used in conjunction with

other water supplies and groundwater storage in Semitropic Water Storage District) to sustain the Zone 7 service area through the worst credible drought. Under Zone 7's Basin Management Plan, some of this 110,000 acre-feet of drought storage can be pumped from the Main Basin in dry years to make up for any SWP shortages (see imported water discussion, below). In wet and normal years, this water is replaced through stream recharge using imported surface water. Zone 7's operational policy is to maintain the balance between the combination of natural and artificial recharge and withdrawal. This preserves the approximately 240,000 acre-feet of storage in the Main Basin for drought and emergency use - 110,000 acre-feet for drought storage and 130,000 acre-feet to be used only in case of extreme emergency (see Figure 5).

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Figure 5

### LIVERMORE-AMADOR VALLEY GROUNDWATER BASIN WEST-EAST CROSS-SECTION



	Bernal	Amador	Mocho II	Total
Area (Ac)	3,100	9,900	4,300	17,300
Saturated Thickness (ft)	246	159	98	168
Storage Coefficient	0.07	0.08	0.06	0.07
Groundwater Vol. (A-F)	53,000	126,000	25,000	204,000
Available Operational Storage	12,000	43,000	22,000	77,000

Figure 5. Livermore-Amador Valley Groundwater Basin Cross-Section

Zone 7 routinely monitors groundwater levels within the Main Basin. Two independent methods are used to estimate groundwater storage – 1) Hydrologic Inventory and 2) Nodal Water Level. The Hydrologic Inventory method computes storage change each quarter from basin supply and demand data. This method can also be used to forecast future water storage conditions. The Nodal Water Level method computes storage from hundreds of water level measurements. As seen in Figure 6, these two independent methods have very good correlation and give added confidence in Zone 7's ability to measure, monitor and even forecast groundwater storage changes. Figure 6 depicts Main

Basin storage levels calculated using the two methods.

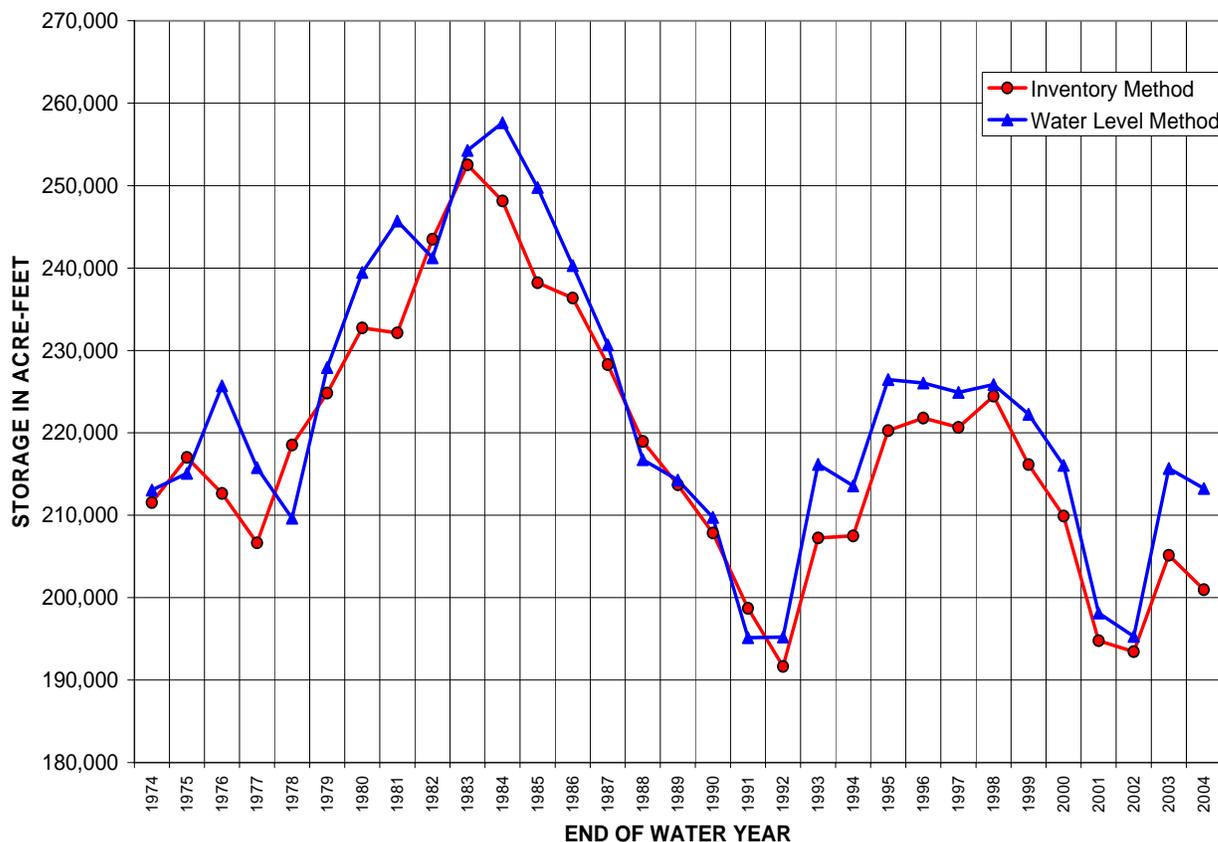


Figure 6. Main Basin Groundwater Storage

Long-term sustainable or safe yield is defined as the average amount of water that can be pumped annually from the Main Groundwater Basin and replenished by natural recharge. Safe yield is determined to be 13,400 AFA which is about 6% of the total estimated groundwater storage and is based on over a century of hydrologic records and projections of future recharge conditions.

A more detailed description of the Main Basin and Zone 7 Water Agency groundwater supplies is provided in the Groundwater Section, Chapter 6, as well as in the Groundwater Management Plan, incorporated herein by reference.

## 5.2 Imported Supplies

Imported surface water forms the majority of Zone 7's total water supply or about 75% of the treated water supplied to its retail customers. In November, 1961, Zone 7 entered into a 75 year agreement with the Department of Water Resources (DWR) and in the following year, received its first delivery from the State Water Project (SWP). SWP water originates within the Feather River watershed, is captured in Lake Oroville, and flows via the Sacramento-San Joaquin Delta and the California and South Bay Aqueducts (SBA) into Zone 7's treatment facilities. SWP water is used to meet municipal and industrial (M&I) demands, agricultural and other untreated water demands, and is also used to artificially recharge the groundwater basin. Zone 7 reached its maximum original SWP Table A quantity of 46,000 acre-feet in 1997. Since then, through water transfers,

Zone 7 has obtained additional SWP allocations, and now has a long-term contract with the SWP for delivery of up to 80,619 acre-feet of water a year. Water transfers are discussed in more detail in the Water Transfers Section, Chapter 8.

Due to hydrologic conditions, requests by other SWP contractors, SWP facility capacity, and environmental/regulatory requirements, DWR will not be able to supply Zone 7's full Table A quantity at any one time. Furthermore, as Metropolitan Water District in Southern California takes more of its allotment each year, the annual yield to other contractors will decline. The average yield of the SWP will continue to decline as total demand on the system increases from 3.8 to 4.1 million acre-feet per year. Using DWR's computer simulation model (DWRSIM) and CALSIM II, DWR's operation studies indicate an average future yield of 76% or 60,900 AFA for Zone 7 (based on the current SWP Table A quantity of 80,619 AFA).

### **5.3 Locally Conserved Water in Lake Del Valle**

Zone 7 holds water rights for flows in Arroyo Valle. Runoff from the Arroyo Valle watershed above Lake Del Valle is captured by Del Valle Dam and stored in the lake. This water is made available in Del Valle Reservoir through operating agreements between Zone 7 and DWR. Basically the reservoir is filled by both runoff from winter storms and SWP deliveries through late winter and spring. In late Fall, DWR typically lowers lake levels in anticipation of run-off from winter storm events and to provide flood capacity.

The thirty year historic yield to Zone 7 from Lake Del Valle has been about 8,000 AFA, based on records from construction of Del Valle Dam in 1969 to 1998. The future and long-term yield (2025) is calculated at 9,300 acre feet based on modeling of historic runoff data and future Zone 7 winter season demands. With increased winter demands (as growth occurs), more water can be used directly off the watershed rather than released to preserve storage for flood control needs.

Due to limited storage capacity in Lake Del Valle, Zone 7 is not able to fully capture and maximize local runoff. Plans have been formulated to reclaim existing gravel quarries in the central portion of the Livermore-Amador Valley, between Livermore and Pleasanton, and grant these facilities to Zone 7 for use as groundwater recharge and water resource management facilities. This "Chain of Lakes" would provide the additional storage to allow Zone 7 to capture and use more local runoff. Zone 7 studies have shown that annual quantities of water available from local runoff will vary according to the hydrologic year but could add an additional 3,000 acre feet of water annually on average. Two quarry pits have already been transferred to Zone 7. Completion of the Chain of Lakes is scheduled for 2030.

### **5.4 Recycled Water**

Although small in comparison to the other sources, recycled water does form an important component of regional water supply. Tertiary treated wastewater is used to irrigate the City of Livermore's Municipal Golf Course, Las Positas College and the business parks along the north side of I-580, the Dublin City Sports Grounds, and at various other sites within the Livermore-Amador Valley. Currently almost 3,000 acre-feet of recycled water, supplied by the City of Livermore and Dublin San Ramon Services District, is used for irrigation purposes within the service area. Future recycled water uses are discussed along with treatment and distribution details in the Water Recycling section, Chapter 14.

## **5.5 Total Sustainable Water Supply**

Total Sustainable Water Supply is the sum of the previously discussed sources and includes: the sustainable groundwater yield from the Main Basin, the State Water Project future average delivery, Lake Del Valle future average yield, recycled water use, 2,000 acre-feet annually of BBID water per year and, in drought years, the ability to withdraw from banked supplies in Semitropic and Cawelo. Note that since the overall banking supply is “0” (amount banked during wet years and withdrawn during dry years), these values are not included in Sustainable Yield calculations (see Chapter 7.2, below).

These sustainable water supply quantities are long-term average quantities and in dry years the supply from surface water sources will be greatly reduced. Zone 7 Water Agency stores water from our surface water sources in wet years when the SWP and LDV supplies are above average. Then in dry years, Zone 7 pumps more of the stored water out of the Main Basin or from Zone 7’s Semitropic Water Storage District or Cawelo accounts. Zone 7 is capable of providing 100% of its contracted water obligations even in the event of the worst case multi-year drought. Doing so requires drawdown of the groundwater basin and pumpback from the Semitropic Water Storage District (see Section 7.2). To the extent that conservation can reduce demand during a drought, the groundwater basin and pumpback from Semitropic, can sustain the Valley for even longer periods than it could under a 100% demand scenario.

Table 4. Zone 7 Total Annual Average Supply & Current Sustainable Supply

Source: Zone 7 Annual Review of the Sustainable Water Supply – July Update

SOURCE	Acre-Feet Annually						
	Year	CURRENT SUSTAINABLE SUPPLY	2010	2015	2020	2025	2030 <sup>2</sup>
Groundwater Supply		13,400	13,250	13,300	13,400	13,600	13,750
State Water Project <sup>1</sup>		60,900	63,700	62,900	60,900	60,900	60,900
Lake Del Valle <sup>3</sup>		9,300	8,400	8,900	9,300	9,900	12,500
Recycled Water		2,800	3,500	4,050	4,500	4,500	4,500
Byron Bethany Irrigation District (BBID) <sup>4</sup>		2,000	2,000	2,000	2,000	2,000	2,000
<b>TOTAL ACRE-FEET SUPPLY</b>		<b>88,400</b>	<b>90,850</b>	<b>91,150</b>	<b>90,100</b>	<b>90,900</b>	<b>93,650</b>

<sup>1</sup> Zone 7 submits annual delivery requests to State Water Project.

<sup>2</sup> Chain of Lakes becomes available in 2030, adding approximately 3,000 acre-feet of run-off.

<sup>3</sup> Locally conserved water from the Del Valle Watershed

<sup>4</sup> Byron Bethany Irrigation District represents a long-term water transfer (see Section 7.2)

## **5.6 Wholesale Water**

Zone 7 is the area water wholesaler. There are currently no opportunities for Zone 7 to purchase wholesale water from other water wholesalers as a potential source of supply.

## **6.0 WATER SOURCES-GROUNDWATER**

### *Water Code*

#### *Section 10631.(b)*

*If groundwater is identified as an existing or planned source of water available to the supplier, all of the following information shall be included in the plan:*

*(1) A copy of any groundwater management plan adopted by the urban water supplier, including plans adopted pursuant to Part 2.75 (commencing with Section 10750), or any other specific authorization for groundwater management.*

*(2) A description of any groundwater basin or basins from which the urban water supplier pumps groundwater. For those basins for which a court or the board has adjudicated the rights to pump groundwater, a copy of the order or decree adopted by the court or the board and a description of the amount of groundwater the urban water supplier has the legal right to pump under the order or decree.*

*(3) A detailed description and analysis of the location, amount, and sufficiency of groundwater pumped by the urban water supplier for the past five years. The description and analysis shall be based on information that is reasonably available, including, but not limited to, historic use records.*

*(4) A detailed description and analysis of the amount and location of groundwater that is projected to be pumped by the urban water supplier. The description and analysis shall be based on information that is reasonably available, including, but not limited to, historic use records.*

Zone 7's Groundwater Management Plan (GMP) provides details of both the local basin and the Agency's approach to managing the regional water resources using conjunctive use principles. The GMP is attached to this document and incorporated herein by reference. A brief summary of key elements of the GMP follows.

As described in DWR Bulletin 118 update 2003, California's Groundwater, the Livermore Valley Groundwater Basin (DWR Basin 2-10) extends from the Pleasanton Ridge east to the Altamont Hills and from the Livermore Upland north to the Orinda Upland. DWR has not identified Basin 2-10 as one that is either in overdraft or expected to be in overdraft. Surface drainage features include Arroyo Valle, Arroyo Mocho, and Arroyo Las Positas as principal streams, with Alamo Creek, South San Ramon Creek and Tassajara Creek as minor streams. All streams converge on the west side of the basin to form Arroyo de la Laguna, which flows south and in Sunol Valley joins Alameda Creek which drains to the San Francisco Bay. Some geologic structures restrict the lateral movement of groundwater, but the general groundwater gradient is to the west, then south towards Arroyo de la Laguna.

The entire floor of the Livermore Valley and portions of the upland areas on all sides of the valley overlie groundwater-bearing materials. The materials are continental deposits

from alluvial fans, outwash plains, and lakes. They include valley-fill materials, the Livermore Formation, and the Tassajara Formation. Under most conditions, the valley-fill and Livermore sediments yield adequate to large quantities of groundwater to all types of wells. The quality of water produced from these groundwater-bearing materials ranges from poor to good.

The Main Basin includes portions of the Castle, Bernal, Amador, and Mocho II sub-basins of the Livermore Valley Groundwater Basin. The Main Basin covers an area of over 17,000 acres, and has an estimated storage capacity between 240,000 and 250,000 acre-feet.

At one time, in the days before the construction of the State Water Project, groundwater was the sole water source for the Livermore-Amador Valley. This resource has gone through several periods of extended withdrawal and subsequent recovery. In the 1960's, when approximately 110,000 acre-feet of groundwater was extracted, the Main Basin reached its historic low of 130,000 acre-feet. A more significant recovery period occurred from 1962 to 1983. It was during this era that Zone 7 first conducted a program of groundwater replenishment by recharging imported surface water in its streams for storage in the Main Basin. Table 5 shows Zone 7's monthly artificial recharge amounts from 1974 to 2004. Currently, Zone 7 operates the Main Basin so that under non-emergency conditions, including several multi-year droughts, groundwater elevations do not drop below historic low levels.

Table 5. Zone 7 Historic Artificial Recharge (Units in Acre-Feet)

YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	TOTAL
1974	50	210	320	110	550	520	600	1,090	820	1,760	420	560	7,010
1975	510	50	200	170	570	800	1,130	1,210	940	490	0	0	6,070
1976	410	330	340	510	670	620	670	620	650	330	280	310	5,740
1977	120	50	50	50	50	50	50	450	630	1,600	0	0	3,100
1978	50	170	50	590	890	950	1,860	1,560	1,020	890	470	430	8,930
1979	740	450	710	870	1,180	1,470	1,580	1,320	1,740	1,240	560	420	12,280
1980	360	340	300	800	880	1,520	1,450	1,520	1,140	1,380	1,340	970	12,000
1981	810	610	170	800	1,130	1,320	1,730	1,730	850	470	470	790	10,880
1982	30	250	160	90	760	1,120	1,250	1,280	1,100	846	612	323	7,821
1983	190	10	0	0	0	240	260	180	110	170	180	120	1,460
1984	10	0	170	150	210	110	40	0	0	0	139	201	1,030
1985	102	169	159	188	178	70	0	0	0	0	31	210	1,107
1986	153	74	0	9	191	166	43	0	0	0	0	53	689
1987	172	168	192	209	75	0	0	0	0	0	0	0	816
1988	389	180	81	35	39	286	220	342	324	331	295	293	2,815
1989	711	404	442	443	477	495	239	247	914	285	270	277	5,204
1990	298	478	574	433	296	343	320	491	711	0	0	369	4,313
1991	1,210	56	87	0	0	0	0	0	51	0	0	0	1,404
1992	144	268	155	75	96	11	0	0	0	852	527	670	2,797
1993	165	73	80	397	951	1,373	1,351	794	1,095	1,084	624	87	8,075
1994	568	320	377	22	350	1,331	1,299	1,407	1,312	452	684	275	8,396
1995	15	42	15	0	167	593	916	605	900	161	134	99	3,647
1996	19	8	1	7	29	255	406	457	267	112	358	451	2,371
1997	1	10	152	256	521	634	765	995	1,105	1,268	735	565	7,008
1998	207	0	0	87	294	628	727	612	282	832	506	892	5,067
1999	157	60	76	166	769	732	839	646	1,289	1,230	495	0	6,459
2000	73	178	481	566	954	956	1,008	1,039	980	1,482	497	126	8,339
2001	369	46	60	216	224	52	25	795	389	3,752	457	888	7,273
2002	132	191	682	1,119	1,799	1,572	858	1,143	1,960	1,827	642	15	11,940
2003	339	973	1,293	1,182	1,194	1,259	1,566	1,497	1,284	1,149	362	764	12,862
2004	812	639	772	1,034	777	615	1,061	697	716	486	1,722	1,277	10,607

Zone 7's present groundwater management plan is to maintain about 130,000 acre-feet (i.e. the historic low level) of extreme emergency storage at all times, even after a prolonged drought. Zone 7's typical annual operational plans call for seasonal storage fluctuations of 15,000 to 20,000 acre-feet of water within the groundwater basin and the maintenance of about 110,000 acre-feet for drought storage. This amount is sufficient (when used in conjunction with other specified water supplies and groundwater in off-site storage) to sustain the Zone 7 service area through the worst credible drought. Under Zone 7's Basin Management Plan, some of this 110,000 acre-feet of drought storage can be pumped from the Main Basin in dry years to make up for any SWP shortages. In wet and normal years, this water is replaced through current instream recharge using imported surface water, with plans to augment the instream recharge with offstream recharge facilities with a future Chain of Lakes facility. Zone 7's operational policy is to maintain the balance between the combination of natural and artificial recharge and withdrawal. This preserves the approximately 240,000 acre-feet of storage in the Main Basin for drought and emergency use - 110,000 acre-feet for drought storage and 130,000 acre-feet to be used only in case of extreme emergency.

Long-term sustainable (also called "safe") yield is defined as the average amount of water that can be pumped annually from the Main Groundwater Basin and replenished by natural recharge. More water can be and is pumped from the main basin each year as long as Zone 7 artificially recharges the basin with additional water from Zone 7's outside sources. Sustainable yield is determined to be 13,400 AFA which is about 6% of the total estimated groundwater storage.

The long-term sustainable yield is based on over a century of hydrologic records and projections of future recharge conditions. Based on this sustainable yield value, the Valley’s major water retailers are permitted to pump 7,200 acre-feet annually without charge (established in the original retail contracts as “Independent Quota”). This amount, now referred to as Groundwater Pumping Quota, is established as part of Zone 7’s Municipal and Industrial water supply contract with each retail water supply agency. The retail water agencies that have groundwater pumping capability, are permitted to pump more water from the Main Basin and are charged a recharge fee. This fee covers the cost of importing and recharging additional water into the Main Basin. The balance of the sustainable yield is pumped for other municipal, agricultural and gravel mining uses. Zone 7’s pumpage for its treated water system does not use the natural sustainable yield from the basin; instead Zone 7 pumps only water that has been recharged as a part of its artificial recharge program.

As mentioned previously, plans are in place to reclaim existing gravel quarries in the central portion of the Livermore-Amador Valley, between Livermore and Pleasanton, and dedicate these facilities to Zone 7 for use as groundwater recharge and water resource management facilities. Ultimately, this “Chain of Lakes” could cover 2,000 acres and store approximately 100,000 acre-feet of water. Zone 7 would store excess water during wet and/or normal years and use those supplies during dry years thereby increasing annual groundwater replenishment capability. Although full implementation of this plan would not occur until about 2030, there would likely be opportunities to use individual gravel quarries or Lakes as they become available. The first of these, Lake I, located off Arroyo Mocho, was dedicated to Zone 7 in June 2003.

In addition to Lake I, Zone 7 also acquired Cope Lake, a 220 acre former mining pit that was used as a water supply source by the gravel operators. Although largely sealed from the aquifer and not a part of the Chain of Lakes, Cope Lake does offer some potential for other uses such as flood detention or recycled water seasonal storage.

Groundwater storage serves to increase the reliability and redundancy of Zone 7’s treated water supply such that treated water is available to Zone 7 customers when annual State Water Project allocations are low during a drought year, or in the event of an emergency. The ability of Zone 7 to respond to a situation in which SWP deliveries were reduced will be covered in more detail in the Reliability Section. However, as a general principle, Zone 7 would utilize its groundwater pumping capability and encourage City of Pleasanton and California Water Services Company to do likewise. Zone 7’s groundwater production capacity is illustrated in the following table (Table 6).

Table 6a. Zone 7 Groundwater Produced and Water Quality. 2000 – 2004

YEAR	GW PRODUCED (Acre-Feet)	% of TOTAL PRODUCTION	TDS (mg/l)	HARDNESS (mg/l)
2000	7,155	19%	384	255
2001	9,707	25%	419	266
2002	10,952	28%	457	291
2003	8,844	23%	442	305
2004	11,600	27%	448	317

Table 6. Zone 7 Groundwater Production Wells

FACILITY	AVG.CAPACITY GPM	SUSTAINED CAPACITY FOR PLANNING		3 Month Avg sust. Capacity	Power consumption		PEAK CAPACITY	2005	
		MGD	AF/MONTH	MGD	KWH/AF	KWH/AF/FT	MGD	TDS	Hardness
								mg/l	mg/l
<b>HOPYARD WELL FIELD</b>	4,980	7.1	666	7.1			7.8		
HOPYARD 6	3,800	5.5	515	5.5	603	1.7	6.0	490	300
HOPYARD 9	1,240	1.6	152	1.6	619		1.8	440	300
<b>MOCHO 1&amp;2 WELL FIELD</b>	4,660	6.1	571	18.5			6.8		
MOCHO 1	2,370	3.1	290		587		3.4	650	450
MOCHO 2	2,290	3.0	281		587		3.3	500	390
<b>MOCHO 3&amp;4 WELL FIELD</b>	7,790	10.2	954				11.3		
MOCHO 3	4,130	5.4	505		652	1.6	6.0	520	400
MOCHO 4	3,660	4.8	449		782	1.5	5.3	520	340
STONERIDGE	4,660	6.1	571		684	2.0	6.8	370	240
<b>TOTAL GROUNDWATER</b>	22,090	<b>30</b>	<b>2,760</b>	<b>26</b>	<b>684</b>		<b>33</b>		

## 7.0 RELIABILITY OF SUPPLY

*Water Code*

*Section 10631*

*A plan shall be adopted in accordance with this chapter and shall do all of the following:*

*(c) Describe the reliability of the water supply and vulnerability to seasonal or climatic shortage, to the extent practicable. Provide data for each of the following: (1) An average water year, (2) A single dry water year, (3) Multiple dry water years.*

Zone 7 has adopted a Water Supply Reliability Policy – Zone 7 Board Resolution No. 04-2662 (Reliability Policy). This policy is to maintain the ability to meet 100% of Zone 7’s estimated treated water demands 100% of the time, including during a multi-year drought period. The “Reliability Policy for Municipal and Industrial Water Supplies,” adopted by the Zone 7 Board in May 2002 and revised in August 2004 has two “Goals” (see Appendix B).

Goal 1 directive is to meet 100% of its treated water customers water supply needs in accordance with Zone 7’s most current contracts for Municipal and Industrial (M&I) Water Supply, including existing and projected demands for the next twenty (20) years, even during extended drought periods. It states that “Zone 7 will endeavor to meet this goal during an average water year, a single dry water year, and multiple dry water years.”

Goal 2 is to “Provide sufficient valley-wide groundwater production capacity (including Zone 7’s and Contractors’ wells) to meet at least 75% of the estimated maximum daily M&I water demand.” While these goals provide guidance to staff in planning reliable facilities, storage and water supplies, they do not imply that Zone 7 is not committed to conservation. In previous droughts, significant reductions in demand were achieved through the combined efforts of Zone 7 and its four retail water suppliers (Dublin-San Ramon Services District, City of Livermore, City of Pleasanton and California Water Service Company); the demand reductions achieved during the most recent drought are shown graphically in Figure 6 (presented in Chapter 10).

To ensure that the 100% reliability criteria is met, Zone 7’s policy statement directs staff

to pursue multiple water supply sources, i.e. imported water, recycled water, demand reduction/water conservation measures, additional groundwater production facilities, and optimize their use with increased conjunctive use of the groundwater basin as well as additional out-of-valley (Semitropic Water Storage District) storage. Zone 7 will also develop supplementary groundwater pumping capacity in order to provide well production capacity equal to 75% of maximum day M&I demands to protect against emergency curtailments in SWP deliveries or water treatment plant outages.

Every April Zone 7 prepares a water supply assessment of the Livermore-Amador Valley sustainable water supply. The 2005 sustainable supply is 88,400 acre-feet and current estimated 2030 “Buildout Demand” is 69,370 acre-feet (see Table 9). Operational studies used in this assessment demonstrate that Zone 7 has sufficient water supply to meet this future demand for every hydrologic year on record (see Table 4). The capital facilities needed to store, treat and deliver this water have been identified and are incorporated into the agency Capital Improvement Plan (CIP). Zone 7 has sufficient sustainable supplies to provide for all treated water demands through build-out and for all currently contracted untreated water demands.

Note that in addition to the goals stated above, Zone 7 has a number of planning and operational criteria, which are associated with this Board resolution and are as follows:

1. Provide surface water treatment design capacity to meet 85 percent of the Zone 7 maximum day demand for reliability and operational flexibility. This is shown graphically in Figure 7 on the following page.
2. Operate water supplies so that the groundwater basin levels do not drop below historic lows.

### **7.1 State Water Project Availability**

The ability of the State Water Project (SWP) to deliver full water supply requests to its contractors in any given year depends on a number of factors - rainfall, size of snowpack, runoff, water in storage, and pumping capacity in the Delta. Therefore, the actual yield of the SWP varies from year to year and is usually discussed in terms of average year, wet year, and dry year deliveries.

Average year SWP yield is estimated to be about 76% of contracted allocations. Wet year conditions are defined as those years when surplus water is available from the SWP. During these wet years, surplus water supplies may be stored locally or outside the Main Basin for subsequent use in later years.

Zone 7, the first State Contractor to take water deliveries, has a long-term contract with the SWP for delivery of 80,619 acre-feet of water a year. However, the SWP with its present configuration and lower demands can only deliver about 82% of its contracted amounts and this quantity will decrease as the demands by all SWP contractors increase. For instance, as Metropolitan Water District increases its annual SWP allotment, the annual yield to other contractors will decline. DWRs’ operation studies using the DWRSIM (computer model) indicate an average future (2020) yield of 75.57% (60,900 acre-feet). “The State Water Project Delivery Reliability Report” draft released in August 2002, which uses CALSIM II model data indicate an average yield of 75-76% (74.59% for Study 2021A and 75.73% for Study 2021B). Zone 7 reviewed this report and confirmed that this estimate of 75.57% as the average future yield is still generally valid. This yield assumes that Zone 7 has the storage and conveyance capacity to take all SWP

water in every year when water is available. However, if Zone 7 lacks this conveyance or storage capacity or if CALFED restrictions change SWP operations, then Zone 7 would get a lower long-term average yield.

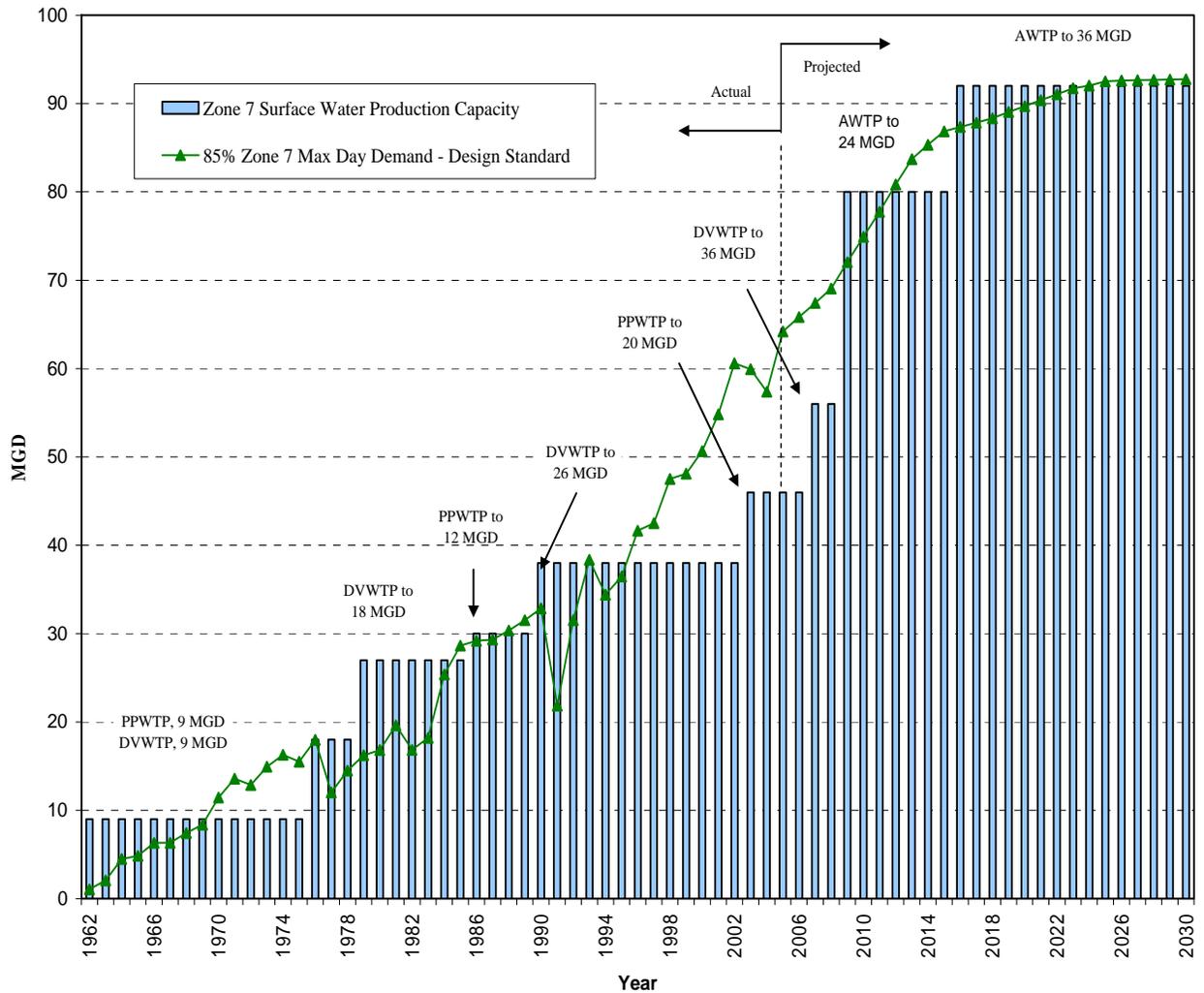


Figure 7. Zone 7 Surface Water Production Capacity vs. 85% Zone 7 Max Day Demand

### 7.2 Transfer Opportunities

Dry year conditions may result in even lower SWP deliveries than the 75-76% anticipated in average years. Consequently, to compensate for this anticipated drought season reduction in SWP deliveries, Zone 7 investigated supplemental sources of water, either from storage or dry-year water transfers. The 1987 Statement on Zone 7’s Groundwater Management (incorporated by reference into the Groundwater Management Plan) recommends management of the Main Basin so that groundwater levels remain above the historic lows in any given dry year or extended drought period. To ensure that this management approach can be implemented, additional dry year water and storage transfer opportunities were investigated. The resultant decision was to pursue water transfer opportunities such as seeking additional storage capacity outside the Zone 7 service area and seeking additional SWP allocations (see Table 14).

Zone 7 has increased its SWP Table A quantity from its original maximum of 46,000

acre-feet to 80,619 acre-feet. These dry year water supplies are required to provide 100% reliability

In 1994, Zone 7 also entered into a short-term water transfer demonstration project with Byron Bethany Irrigation District (BBID) which provided a minimum supplemental water supply of 2,000 AFA. This was a five year agreement with a potential to purchase up to 5,000 AFA. In 1998, both Zone 7 and BBID decided to convert the short-term agreement into a long-term, 15 year contract, renewable every five years up to a total of 30 years.

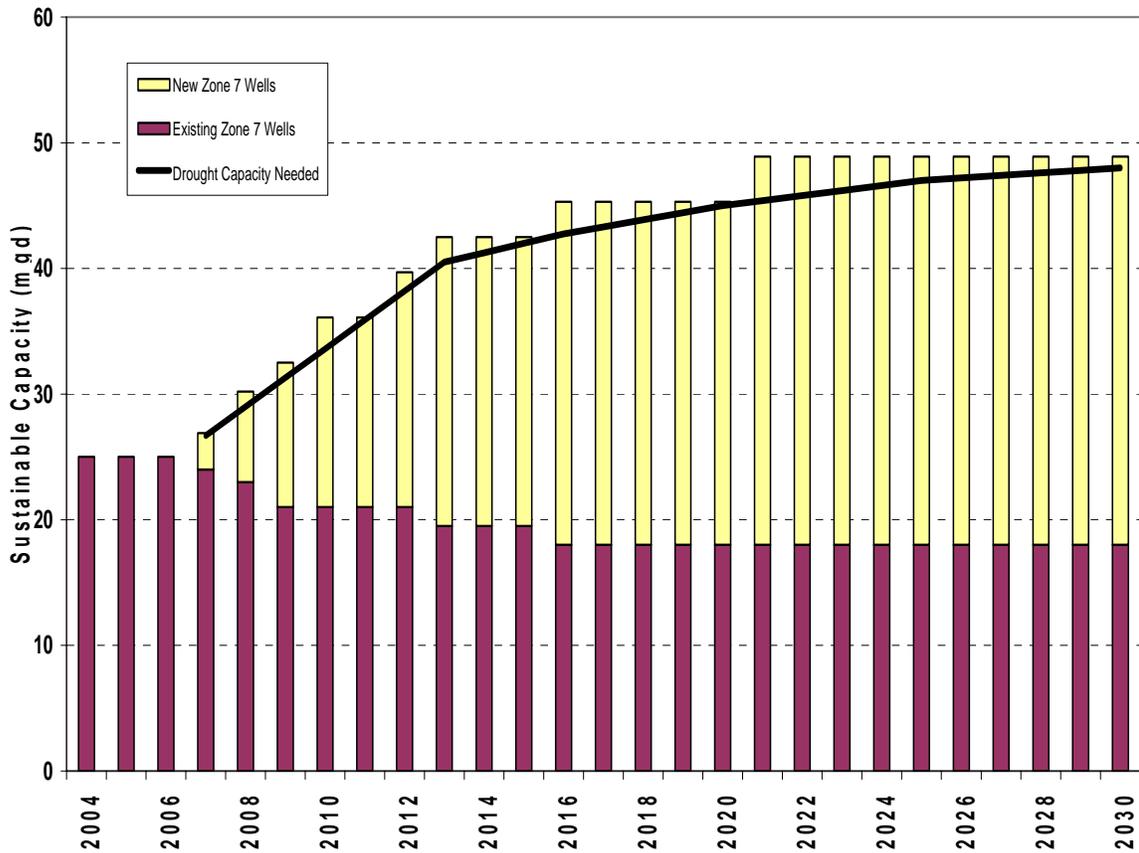
In addition, Zone 7 has purchased 22,000 acre-feet of storage capacity in the Semitropic Water Storage District (STWSD) Groundwater Banking Program. Another 43,000 acre-feet of storage capacity in the Banking Program was acquired by Zone 7 for the Dougherty Valley development. In 2004, Zone 7 entered into an agreement in principle with Cawelo Water District for an “In Lieu Banking Program”. This involves putting two acre-feet into and taking one acre-foot out exchange and bond program. Basically, this additional storage capacity acts as drought protection by allowing Zone 7 the option of storing excess imported surface water during wet or normal hydrologic years and withdrawing this water during dry years. Although this is considered a “storage project” by Zone 7, DWR considers this to be a type of water transfer.

Actual water transfer projects are discussed in more detail in Chapter 8, below.

### **7.3 Local Groundwater as a Drought “Bank”**

As mentioned earlier, Zone 7 operates the Main Groundwater Basin so that under non-emergency conditions, including multi-year drought periods, groundwater levels do not drop below historic low levels (see also the attached Groundwater Management Plan). Zone 7 currently uses local storage in the Main Basin and distant storage in Semitropic Water Storage District (and planned storage in Cawelo) to ensure that it has a totally reliable water supply in any given hydrologic water year. The Main Basin provides a hedge against a situation such as a prolonged drought period occurring simultaneously with a delay in obtaining a transferred water supply. If an extended drought were to force cutbacks in SWP deliveries, Zone 7 would utilize groundwater resources to meet the demands of its customers. Again, this planning for reliability does not imply that conservation would not also be encouraged both by Zone 7 and its retail urban water supply agencies. Figure 8 graphically displays Zone 7’s well capacity for drought protection.

**ZONE 7 WELL CAPACITY FOR DROUGHT PROTECTION**



*Figure 8. Zone 7 Well Capacity for Drought Protection*

**7.4 Out of Basin Groundwater Storage as a Drought “Bank”**

Zone 7 utilizes 65,000 AF of groundwater basin storage in Semitropic to store SWP supplies available in above average rainfall runoff years. This water can be pumped out and transferred back to Zone 7 via SWP conveyance facilities. This is made possible through coordination and management of our water supply operations.

Proper planning, along with construction and utilization of efficient facilities, enables Zone 7 to maintain a water supply system with a reliability of 100%. The management of storage facilities and their associated conveyance systems, is a vital component of Zone 7's ability to deliver a sustainable water supply during dry and critically dry years.

## **8.0 WATER SUPPLIES & TRANSFERS**

### *Water Code*

#### *Section 10631.*

*A plan shall be adopted in accordance with this chapter and shall do all of the following:*

*(b) Identify and quantify, to the extent practicable, the existing and planned sources of water available to the supplier over the same 5-year increments [to 20 years or as far as data is available.]*

*(d) Describe the opportunities for exchanges or transfers of water on a short-term or long-term basis.*

To protect its customers in the event of a prolonged drought and to maintain its goal of 100% reliability in any circumstance, Zone 7 has entered into several long-term water transfer agreements to supplement its regular surface water supplies and to best manage the local groundwater basin (see attached Groundwater Management Plan). These long-term agreements will enable Zone 7 to avoid major service disruptions in the event of a multi-year drought and have the capacity to maintain full water deliveries to its customers.

### **8.1 Imported Supplies**

Imported water forms the bulk of Zone 7's total water supply. In November, 1961, Zone 7 entered into a 75 year agreement with the Department of Water Resources (DWR) and in the following year, received its first delivery from the State Water Project (SWP). SWP water originates within the Feather River watershed, is captured in Lake Oroville, and flows via the Sacramento-San Joaquin Delta and the California and South Bay Aqueducts (SBA) into Zone 7's treatment facilities. SWP water is used to meet municipal and industrial (M&I) demands, agricultural and other untreated water demands, and is also used to artificially recharge the groundwater basin. Zone 7 reached its maximum original SWP Table A quantity of 46,000 acre-feet in 1997.

Since 1997, Zone 7 has increased its SWP contract amount to 80,619 acre-feet through a series of permanent transfers. In December 1999, Zone 7 secured Table A SWP allocations from Lost Hills Water District of 15,000 Acre-Feet Annually (AFA) and Berrenda Mesa Water District of 7,000 AFA. This enabled Zone 7 to increase its SWP Table A Maximum Annual Allocation to 68,000 AFA. In December 2000, 10,000 acre-feet of SWP allocation from Kern County Water Agency (KCWA) was acquired, which increased Table A Maximum Annual Allocation to 78,000 AFA. In October 2003, an additional 2,219 acre-feet was obtained from the same source bringing the total from KCWA to 12,219 acre-feet. This and 400 acre-feet of water from Tulare Lake Basin Water Storage District raised Zone 7 Table A quantity amount to 80,619 acre-feet.

As mentioned in Section 7.2, in 1994, Zone 7 entered into a short-term water transfer demonstration project with Byron Bethany Irrigation District (BBID) which provided a minimum supplemental water supply of 2,000 AFA. This was a five year agreement with a potential to purchase up to 5,000 AFA. In 1998, both Zone 7 and BBID decided to convert the short-term agreement into a long-term, 15 year contract, renewable every five years up to a total of 30 years. BBID has pre-1913 water rights to water in the Delta.

## 8.2 Water Banking Outside Zone 7

In addition to the above listed sources of water and agreements, Zone 7 has purchased 22,000 acre-feet of storage capacity in the Semitropic Water Storage District (STWSD) Groundwater Banking Program. Another 43,000 acre-feet of storage capacity in the Banking Program was acquired by Zone 7 for the Dougherty Valley development. Basically, this additional storage capacity acts as drought protection by allowing Zone 7 the option of storing excess imported surface water during wet or normal hydrologic years and withdrawing this water during dry years.

Table 7. Zone 7 Water Supply Acquisition Projects

Project Name	Contract Amount (Avg Yield)	Term/Expiration
<b>Long-Term Water Supply Sources</b>		
State Water Project	46,000 afa (yield)	Until 11/20/2036
Local Arroyo Valle Water Rights	9-12,000 afa average yield	Perpetual
Byron-Bethany Irrigation District	2 - 5,000 afa	Until 12/31/2013, renewable to 12/31/2028
Berrenda Mesa SWP Contract Amount Transfer	7,000 afa; (920 afa net to Zone 7) (yield)	Until 11/20/2036
Lost Hills SWP Contract Amount Transfer	15,000 afa (yield)	Until 11/20/2036
Belridge SWP Contract Amount Transfer	10,000 afa (yield)	Until 11/20/2036
Belridge SWP Contract Amount Transfer	2,219 afa (yield)	Until 11/20/2036
Tulare Lake Basin Water Storage District - SWP Transfer	400 afa (yield)	Until 11/20/2036
<b>Drought Year Protection</b>		
Groundwater Basin Management	270,000 af total storage, 140,000 operational storage	Perpetual
Semitropic Water Storage Bank (43,000 af)	43,000 af storage and 3,870 afa, min pumpback	Until 12/31/2035
Semitropic Water Storage Bank (22,000 af)	22,000 af storage and 1,980 afa, minimum pumpback	Until 12/31/2035
Semitropic Increased Pumpback Project (Stored Water Recovery Unit, SWRU)	3,250 afa minimum pumpback	Until 12/31/2035
Cawelo Water District	10,000 afa minimum pumpback	Until 2035, renewable pending

SBA = South Bay Aqueduct  
 SWC = State Water Contract  
 SWP = State Water Project

afa= Acre-feet per year  
 af/mo = Acre-feet per month, peaking

## **9.0 WATER USE BY CUSTOMER**

### *Water Code*

#### *Section 10631*

*(e) (1) Quantify, to the extent records are available, past and current water use, over the same five-year increments described in subdivision (a), and projected water use, identifying the uses among water use sectors including, but not necessarily limited to, all of the following uses: (A) single-family residential, (B) multi-family, (C) commercial, (D) industrial, (E) institutional and governmental, (F) landscape, (G) sales to other agencies, (H) saline water intrusion barriers, groundwater recharge, or conjunctive use, or any combination thereof,*

*(2) Agricultural.*

Zone 7 Water Agency is a water wholesaler and supplies treated water to retail water agencies for Municipal and Industrial (M&I) use. Zone 7 also serves untreated surface water directly to several agricultural and other smaller customers. In addition, Zone 7 serves treated water directly to an extremely small number of retail customers (significantly less than 3,000). The main Zone 7 retailers are Dublin San Ramon Services District (DSRSD), which serves Dublin and the Dougherty Valley development; City of Pleasanton Municipal Water Department, serving Pleasanton; and the California Water Services Company (CWS) and City of Livermore Municipal Water Department which together provide water service to Livermore.

As a wholesaler, Zone 7 does not have access to records of individual use such as single-family versus multi-family versus commercial use, for example. However, using estimates provided by local water retailing agencies, it appears that the percentage of residential water users varies from a low of about 60% in Pleasanton and DSRSD service areas to a high of about 75% in Livermore. The remainder of the water provided to the retail water suppliers makes up commercial, industrial, and institutional-governmental uses. There are no significant projected changes during the study planning period. Again, reference is made to specifics provided by retail water suppliers in individual UWMPs.

Per capita water use for each of Zone 7's major water retailers, as well as an overall service area use, is illustrated by Figure 6. More detailed information on retailer use is presented in UWMP's specific to each retailer.

Treated water demand is comprised almost entirely of water scheduled for delivery to the cities by the four major retailers. Zone 7 also provides water service to institutional users such as the Veterans Administration Medical Center and the Dublin Housing Authority. All treated water supplied by Zone 7 to the four major retailers is considered Municipal and Industrial (M&I) use.

Agricultural/non-potable water use is a small part of Zone 7's operation. There are currently 11 turnout customers who get water deliveries directly from the South Bay Aqueduct. Individual customers branch off the turnout customer systems and currently number 71. Non-potable water use is around 4,000 AFA with a potential of growing to 8,250 by year 2030.

Table 8. Zone 7 Water Demand. Units in acre-feet.

Deliveries to Retail Water Supply Agencies	Actual		Projected					
	2000	2004	2005	2010	2015	2020	2025	2030
City of Livermore	6,169	6,785	7,470	7,620	9,400	9,900	10,200	10,200
City of Pleasanton	13,938	15,614	15,670	18,320	21,800	22,700	23,400	23,400
California Water Service Company	7,802	8,994	8,470	10,320	12,600	13,200	13,650	13,700
Dublin-San Ramon Services District *	7,368	10,978	11,760	12,820	13,100	12,900	13,250	13,320
Direct Sales to Treated Water Customers	306	775	280	290	340	410	460	500
<b>Total Treated Water Sales</b>	<b>35,583</b>	<b>43,146</b>	<b>43,650</b>	<b>49,370</b>	<b>57,240</b>	<b>59,110</b>	<b>60,960</b>	<b>61,120</b>
No. of Non-Potable Customers**	10/47	11/65	11/71	12/80	12/90	12/100	12/100	12/100
Agricultural	5,899	3,530	3,900	8,250	8,250	8,250	8,250	8,250
<b>Total Water Sales</b>	<b>41,482</b>	<b>46,676</b>	<b>47,550</b>	<b>57,620</b>	<b>65,490</b>	<b>67,360</b>	<b>69,210</b>	<b>69,370</b>
Other Uses								
Artificial Recharge	8,000	10,600	9,000	15,000	20,000	20,000	25,000	30,000
SWP to Semitropic	3,740	5,166	5,166	5,000	5,000	5,000	5,000	5,000

Source: Zone 7 Annual Review of Sustainable Supply Report and Contractor Delivery Requests 2006-10

\* Includes Deliveries to Dougherty Valley

\*\* Number of Turnout Customers/Number of Individual Customers

## **10.0 WATER DEMAND MANAGEMENT MEASURES**

### *Water Code*

#### *Section 10631.*

*(f) Provide a description of the supplier's water demand managements.*

*This description shall include all of the following:*

*(1) A description of each water demand management measure that is currently being implemented, or scheduled for implementation, including the steps necessary to implement any proposed measures, including, but not limited to, all of the following [listed in the accompanying section]:*

*(2) A schedule of implementation for all water demand management measures proposed or described in the plan.*

*(3) A description of the methods, if any, that the supplier will use to evaluate the effectiveness of water demand management measures implemented or described under the plan.*

*(4) An estimate, if available, of existing conservation savings on water use within the suppliers' service area, and the effect of such savings on the supplier's ability to further reduce demand.*

*(g) An evaluation of each water demand management measure listed in paragraph (1) of subdivision (f) that is not currently being implemented or scheduled for implementation. In the course of the evaluation, first consideration shall be given to water demand management measures, or combination of measures, which offer lower incremental costs than expanded or additional water supplies.*

*(h) Urban water suppliers that are members of the California Urban Water Conservation Council and submit annual reports to the council in accordance with the "Memorandum of Understanding Regarding Urban Water Conservation in California", dated September 1991, may submit the annual reports identifying water demand management measures currently being implemented, or scheduled for implementation, to satisfy the requirements of subdivisions (f) and (g).*

Zone 7 Water Agency recognizes water conservation, or demand management, as a priority in any water resources strategy developed for the Livermore-Amador Valley region. However, Zone 7 is not a signatory to the Memorandum of Understanding Regarding Urban Water Conservation in California (MOU) and therefore is not a member of the California Urban Water Conservation Council (CUWCC).

However, in 1991, the Zone 7 Board of Directors adopted Resolution 1506 (Appendix C), which endorses water conservation and expresses a willingness to support and implement the Best Management Practices (BMPs) outlined in the MOU. Though it is not a signatory, Zone 7 has made, and will continue to make, good faith efforts to implement all applicable BMPs listed in the CUWCC MOU. In particular, Zone 7 recognizes its obligations under BMP 10, wholesaler assistance to its retail water supply agencies. Water conservation is a major component of Zone 7's water supply management strategy, as recognized by our listing of water conservation programs in the Agency ten-year Capital Improvement Plan. Over \$170,000 annually is budgeted for programs that offer financial incentives (rebates) for the purchase and installation of low water use devices, such as ultra-low-flush toilets and high efficiency washing machines. An additional

\$135,000 is budgeted for implementation of other applicable BMPs.

The overall objective of Zone 7's water conservation program is to achieve and maintain a high level of water use efficiency throughout the Livermore-Amador Valley. Specific objectives include:

- Elimination of wasteful practices in water use;
- To attain maximum water use efficiency;
- Development of information on current and potential water efficient practices; and
- Timely implementation of water efficient use practices.

In 2002 Raines, Melton, & Carella, Inc (RMC) conducted a study and evaluation of Zone 7's water conservation program to assess its current status and to recommend areas of improvement or expansion. A copy of the study's Executive Summary can be found as Appendix F.

The RMC study identified three tiers of water conservation program implementation. The first tier being high priority programs that would ensure Zone 7 would stay in compliance with proposed CALFED regulations. The second and third tiers would have correspondingly lower priority programs.

One of the first tier programs identified by RMC is a Coordinated Regional Water Conservation Program. Zone 7 is already implementing the regional program in DMMs 6 (washer rebate), 10 (wholesaler assistance) and 14 (ULFT rebate). See the appropriate DMM section for additional detail. Zone 7 also meets with staff from its water retailers, usually to coordinate efforts on a regional public outreach project. RMC recommended an expanded role for Zone 7, perhaps meeting with water retailer staff monthly to determine financial, technical and coordination assistance required from Zone 7 for implementation of retailer water conservation efforts.

As well as an expanded role for Zone 7 under DMM 10, other water conservation programs are being examined for future implementation. To assist not only the professional landscaper, but also the individual homeowner in maximizing irrigation efficiency, Zone 7 will install a "Watering Calculator" and "Watering Index" on its website. This is a concept originally developed by City of San Diego and is now found on the websites of several water agencies. The Landscape Watering Calculator is an easy-to-use webtool that helps homeowners and landscapers estimate the right amount of water for their landscape or garden. More detail can be found in Section 10.1.9 DMM 9.

Since the mid-1980's, Zone 7's service area population has grown by over 50% (from about 125,000 in 1987 to a present day level of approximately 190,000) but overall per capita water use has only increased by approximately ten percent. Much of the increase in per capita water use can be attributed to landscaping within new development areas that has occurred during that time period. Landscaping usually requires more water during initial stages of planting and will show increased water use until the vegetation is established, at which point per capita water use should more closely reflect regional water conservation practices. Additionally, evapotranspiration (ET<sub>o</sub>) rates are higher in the Livermore-Amador Valley than in the cooler, coastal areas nearer San Francisco Bay. Per capita water use in the Zone 7 service area is depicted in Figure 6.

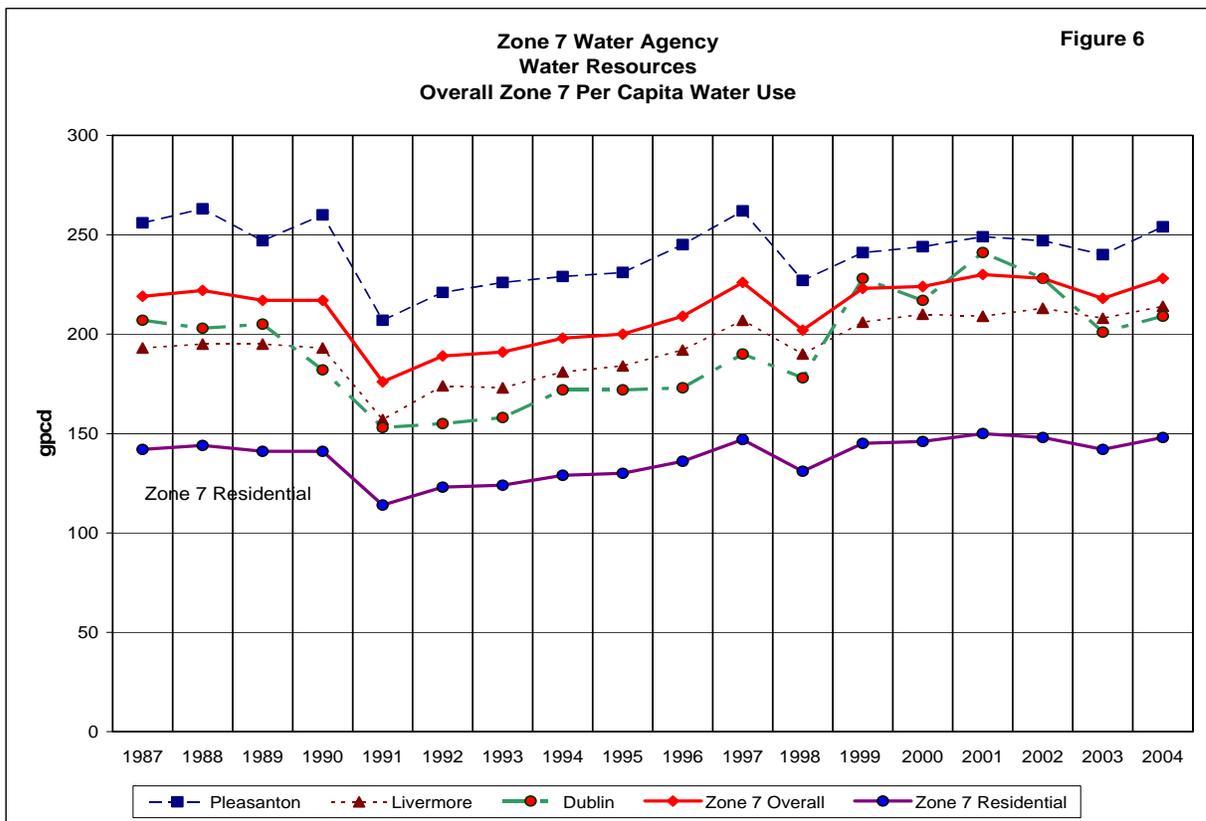


Figure 6. Zone 7 Per Capita Water Use. 1987 – 2004.  
Units in gallons per capita per day (gpcd).

Source: Population figures are official state estimates from CA Dept. of Finance. They include the 1990 and 2000 census. Water use is determined from Zone 7 Production Records.

### **10.1 Implementation of Demand Management Measurements (DMMs)**

Section 10631(f) of the Urban Water Management Planning Act identifies fourteen demand management measures (DMMs) for urban water suppliers to address. These DMMs are identical to the BMPs listed in the “Memorandum of Understanding Regarding Urban Water Conservation in California,” dated September 1991. *Of these fourteen BMPs, only BMP 10 (Wholesale Agency Assistance Programs) is directly aimed at water wholesale agencies. In the case of most of the BMPs (or DMMs), Zone 7 Water Agency relies on its retail agencies to implement them (see individual UWMPs submitted for the four retail urban water suppliers, Dublin-San Ramon Services District, City of Pleasanton, City of Livermore and California Water Service Company).*

The DMMs that are directly applicable to Zone 7 are currently being implemented by the agency. Even though the BMPs listed in the MOU, and consequently many of the DMMs, are directed towards retail water supply agencies, Zone 7 will continue to make good faith efforts to work with and support its retail water supply agencies to implement the BMPs regionally. Where implementation of a particular BMP is more appropriately carried out by the retail agencies, Zone 7 encourages timely implementation of the BMP and provides whatever support is requested. This encouragement may include, but is not limited to, financial incentives as appropriate.

### **10.1.1 DMM 1 – Water Survey Programs for Single-Family Residential and Multi-Family Residential Customers.**

*Implementation methods shall be at least as effective as identifying the top 20% of water users in each sector, directly contacting them (e.g. by mail and/or telephone) and offering the service on a repeating cycle; providing incentives sufficient to achieve customer implementation (e.g. free showerheads, hose end sprinkler timers, etc.)*

*(Water Code Section 10631(f), 1-A)*

This DMM is not applicable to Zone 7. As a treated water wholesaler, Zone 7 does not directly serve individual single family or multi-family customers. Zone 7's retailing agencies, California Water Services Company, City of Pleasanton, and DSRSD, have offered water surveys (audits) for their customers. Currently Zone 7 has not discussed a joint venture with its retail water suppliers to develop and implement a targeting/marketing strategy for single-family or multi-family dwellings in the service area.

Implementation: As mentioned previously, this DMM is more appropriately carried out by the retail agencies (see individual UWMPs submitted for the four retail urban water suppliers - Dublin-San Ramon Services District, City of Pleasanton, City of Livermore and California Water Service Company)

### **10.1.2 DMM 2 – Residential Plumbing Retrofit.**

*Implementation methods shall be at least as effective as delivering retrofit kits including high quality low-flow showerhead to pre-1980 homes that do not have them and toilet displacement devices or other device to reduce flush volume for each home that does not already have ULF toilets; offering to install devices; and following up three times.*

*(Water Code Section 10631(f), 1-B)*

Although this DMM is not directly applicable, Zone 7, in conjunction with its retail water supply agencies, will work to support programs promoting the distribution or direct installation of high-quality, low-flow showerheads (rated 2.5 gpm or less), toilet displacement devices (as needed), toilet flappers (as needed) and faucet aerators (rated 2.2 gpm or less), to residences requiring them. As a wholesaler, Zone 7 will not have records to determine which residences were constructed prior to 1992 – that task is left to the discretion of the retail water supply agencies.

Implementation: This DMM is more appropriately carried out by the retail agencies (see individual UWMPs submitted for the four retail urban water suppliers - Dublin-San Ramon Services District, City of Pleasanton, City of Livermore and California Water Service Company).

### **10.1.3 DMM 3 - System Water Audits, Leak Detection and Repair.**

*Implementation methods shall be as least as effective as at least once every three years completing a water audit of the water supplier's distribution system using methodology such as that described in the American Water Works Association's 'Manual of Water Supply Practices, Water Audits and Leak Detection;' advising customers whenever it appears possible that leaks exist on customer's side of the meter; and performing distribution system leak detection and repair whenever the audit reveals that it would be cost effective.*

Zone 7 fulfils this DMM by conducting a monthly distribution system audit of water production records to determine any losses within its water system. An overall water balance is calculated monthly to identify possible meter problems and to detect leaks. Production figures from Zone 7's water treatment plants and any wells that were operational during the month are compared to total deliveries. If the losses are continuous and excessive, a system-wide leak detection is performed. Typical error is within plus/minus 2 – 3%. For the period from 2001 through 2004, annual overall losses for Zone 7's distribution system averaged about 2% of total production.

Table 9. Zone 7 Treated Water Deliveries and Production. Units in acre-feet

	2001	2002	2003	2004	2005 (Projected)
Total Delivery	37,536	38,438	38,534	43,145	38,980
Total Production	38,776	39,509	39,181	43,668	40,150
Unaccounted Water	1,241	1,071	647	523	1,170
Unaccounted Water (%)	3 %	3 %	2 %	1 %	3%

All facilities are 100 percent metered or gauged. Meters are calibrated regularly as part of Zone 7's preventive maintenance program. Flows in Zone 7's major facilities are monitored continuously via a SCADA system. Zone 7 has 35 miles of pipeline (transmission rather than distribution lines) that are patrolled and inspected regularly by water distribution system operators.

Implementation: Zone 7 will continue to quantify the amount of unaccounted-for water on a monthly basis and will respond to any significant increases as they are identified.

#### **10.1.4 DMM 4 - Metering with Commodity Rates for All New Connections and Retrofit of Existing Connections.**

*Implementation methods shall be requiring meters for all new connections and billing by volume of use.*

*(Water Code Section 10631(f), 1-D)*

This DMM calls for a retrofit of all existing unmetered connections. All water sales by Zone 7 Water Agency are metered – there are no unmetered water connections.

DMM 4 also requires the identification of intra- and inter-agency disincentives or barriers to retrofitting mixed use commercial accounts with dedicated landscape meters and conducting a feasibility study to assess the merits of a program to provide incentives to switch mixed use accounts to dedicated landscape meters. This portion of the DMM is more appropriately carried out by the retail agencies (see individual UWMPs submitted for the four retail urban water suppliers - Dublin-San Ramon Services District, City of Pleasanton, City of Livermore and California Water Service Company).

Implementation: Zone 7 will continue to implement this DMM to the extent possible.

#### **10.1.5 DMM 5 - Large Landscape Conservation Programs and Incentives.**

*Implementation methods shall be at least as effective as identifying all irrigators of large (at least 3 acres) landscapes, contacting them directly, offering landscape audits using methodology such as that described in the Landscape*

*Water Management Handbook prepared by the California Department of Water Resources and cost effective incentives to achieve customer implementation; providing follow-up audits at least once every five years; and providing multi-lingual training and information necessary for implementation. In addition, enacting and implementing landscape water conservation ordinances, or if the supplier does not have the authority to enact ordinances, cooperating with cities, counties and the green industry in the service area to develop and implement landscape water conservation ordinances pursuant to the 'Water Conservation in Landscaping Act' (Government Code 65591 et. seq.).*  
(Water Code Section 10631(f), 1-E)

This DMM is not applicable since Zone 7 does not directly serve any large landscape customers. However, just as is the case with the other non-applicable DMMs, Zone 7 will support our water retailers' efforts to implement this DMM. In the past, we have conducted landscape irrigation workshops for contractors and parks maintenance personnel. Zone 7 has also participated with one of its retail water supply agencies, California Water Service Company, in funding a landscape audit of area schools. Additionally, in April 2004, Zone 7 and DWR installed a CIMIS station in the service area. This station will assist landscape professionals in determining an appropriate irrigation schedule for the properties they manage. The data obtained from this station can also be used by any irrigation customer to develop a water budget. The approximate cost for the CIMIS station installation project was on the order of \$15,000.

Each of the cities within Zone 7's service area has adopted water efficient landscape ordinances. In addition to the cities, the Board of Supervisors of Alameda County has adopted a set of Landscape Water Conservation Guidelines. Unincorporated areas of the county are covered by the state's Efficient Water Landscaping Ordinance.

Implementation: This DMM is more appropriately carried out by the retail agencies (see individual UWMPs submitted for the four retail urban water suppliers - Dublin-San Ramon Services District, City of Pleasanton, City of Livermore and California Water Service Company)

#### **10.1.6 DMM 6 – High-Efficiency Washing Machine Rebate Programs**

*Implementation methods shall be enacted to provide incentives for replacement of older less efficient washing machines with newer, high-efficiency models.*  
(Water Code Section 10631(f), 1-F)

Zone 7 began offering a rebate for the purchase and installation of high-efficiency washing machines in 1999. This program has been hugely popular since its inception-with almost 7,000 rebates having been disbursed in the Tri-Valley. The 7,000 high-efficiency washing machines represent a total annual water savings of about 110 acre-feet.

The Zone 7 High-Efficiency Washing Machine Rebate Program is funded at a rate of \$106,000 per fiscal year. This rate of funding will continue through fiscal year 2006-07 (ending June 30, 2007) when funding will be reduced to \$75,000.

Currently, Zone 7 is participating in the Regional Washer Rebate Program as part of a Bay Area wide coalition of water agencies. Using matching CALFED/DWR grant funds, the Regional High-Efficiency Washer Rebate Program offers residents in the Bay Area, as well as the City of Davis, additional financial incentives for the purchase and

installation of energy/water efficient washing machines. Using this grant, Zone 7 offers a two stage rebate - \$50 for a basic water efficient washer and \$100 for the most water efficient models. The washer rebate program is administered by the Electric and Gas Industries Association.

Table 10. Zone 7 High-Efficiency Washing Machine Rebate Program

ACTUAL	FY 2000/01	FY2001/02	FY2002/03	FY 2003/04	FY 2004/05
Rebate Amount	\$75	\$150 (1)	\$150 (1)	\$75	\$50 or \$100 (1)
No. of Rebates Paid	610	880	1500	1430	1500 - projected
Actual Expenditures	\$56,800	\$104,000	\$126,500	\$121,400	\$135,000
Water Savings (2)	10 AFA	15 AFA	23 AFA	22 AFA	23 AFA

(1) Includes matching CALFED grant.

(2) Based on annual savings of 5,100 gallons/machine from the THELMA study.

Implementation: Zone 7 will continue to implement this DMM. Zone 7 is currently part of the Bay Area Regional High-Efficiency Washer Rebate Program.

### 10.1.7 DMM 7 - Public Information Programs.

*Implementation methods shall be at least as effective as ongoing programs promoting water conservation and conservation related benefits including providing speakers to community groups and the media; using paid and public service advertising, using bill inserts; providing information on customers bills showing use in gallons per day for the last billing period compared to the same period the year before; providing public information to promote other water conservation practices; and coordinating with other governmental agencies, interest groups and public interest groups.*

*(Water Code Section 10631(f), 1-G)*

These programs educate and inform the general public about the roles water plays, either directly or indirectly, within the community. These programs include: working with social groups, political, and business leaders to increase the level of water awareness; establishing a favorable relationship with the media by responding promptly to requests for information and being forthright in any dealings with them; speakers' presentations to community organizations; and presence (through education booths, displays) at community events such as Earth Day celebrations, the Livermore Wine Country Festival, and the annual Alameda County Fair.

Zone 7 makes use of different types of media in its attempts to reach a broad section of Tri-Valley residents. For instance, it has recently developed a series of fact sheets containing information on different aspects of water management, such as conservation, treatment, and quality. Zone 7 also publishes a quarterly newsletter which is mailed to all Tri-Valley households. This newsletter attempts to address relevant topics in a proactive manner.

Zone 7 also maintains a section on its website, "Conservation Connection", through which any interested party with internet access can learn about various water conservation programs. For instance, the "Conservation Connection" has information on rebate programs, landscaping water conservation tips, and links to other useful sites such as CUWCC's "H2ouse", a virtual tour through a house featuring water saving devices throughout the home. Plans are underway to make the website even more useful to residents in the service area. Using the same framework as other water agencies, Zone 7

is looking at installing a “Watering Calculator” and “Watering Index” on its website. This is a concept originally developed by City of San Diego. The Landscape Watering Calculator is an easy-to-use webtool that helps homeowners and landscapers estimate the right amount of water for their landscape or garden. The calculator uses ETo data from the local CIMIS station to develop a weekly estimate of the correct amount of water for a landscape or garden. Because everyone's landscape is different, the calculator will be simplified by using average numbers for weather, plants, and soils found in the Tri-Valley. The City of San Diego has made the software available at no charge to other municipalities and water agencies.

In addition, since substantial amounts of water are used in the outdoor residential sector, primarily for landscaping, Zone 7 has begun to focus public education efforts to educate residents of the Tri-Valley area on efficient irrigation practices. Last autumn, Zone 7 conducted a service area wide postcard mailing advising residents to adjust their irrigation system timers and irrigation schedules. The previous year, Zone 7 participated with two other Bay Area water agencies in a radio campaign to remind people to adjust their irrigation system timers and irrigation schedules. In October, 2003, it combined resources with Santa Clara Valley Water District and Alameda County Water District to produce a series of radio commercials to remind people to cut back on outdoor watering. Zone 7 also maintains a demonstration drought tolerant garden at its former administrative offices in Pleasanton. Additionally, Zone 7 teamed with a software firm to develop the “WaterWise Gardening” CDROM for distribution to residents within our service area. This CDROM provides information for the homeowner to use in establishing water efficient landscaping. The CDs were distributed at no charge to any homeowner in the Zone 7 service area. The updated CDROM will be mailed to interested residents of the Tri-Valley and will also be made available to the retailing agencies.

Implementation: Zone 7 will continue to implement this DMM.

#### **10.1.8 DMM 8 - School Education Programs**

*Implementation methods shall be at least as effective as ongoing programs promoting water conservation and conservation related benefits including working with the school districts in the water suppliers' service area to provide educational materials and instructional assistance.*

*(Water Code Section 10631(f), 1-H)*

Zone 7 has an extremely progressive school education program. As the regional water wholesaler, this is a program that has the potential to provide regional consistency and support to the retail water agencies. As part of its on-going school education program, Zone 7 will work to improve its coordination efforts with its retail water supply agencies to furnish water conservation and educational materials to area schools. Zone 7 also works with primary and secondary schools to provide both technical assistance and educational materials. Water education literature, facility tours, teachers' aids (i.e. groundwater model, classroom presentations) and videos are available through Zone 7 and will be loaned to service area schools at no charge. If a teacher requires technical assistance in making classroom presentations, Zone 7 will supply the appropriate staff.

Zone 7 has also investigated alternative methods designed to involve students in water education. To cite an example, Zone 7, in a cooperative effort with a local high school, developed an innovative program that utilized science students to conduct classroom presentations showcasing different aspects of the hydrologic cycle to primary school students. The premise was that the younger students would be more willing to accept

information from high schoolers, whom they view as older brothers and sisters, than from adults. This program also allows the older students to cultivate and refine their communication skills in a non-threatening environment. It is widely successful and the initial implementation of this program was reported in the local media.

During the 2004-05 school year, Zone 7 began working with environmental sciences students from Foothill High School in Pleasanton to develop a portable watershed education model. As conceptualized, this model would be about table top size and would depict water flow through the Zone 7 Water Agency watershed. Obviously, this will be a multi-year program and will be carried out by successive generations of science students but it should result in a functioning watershed model.

A recent Cal Poly study found that approximately 25% of California public schools have school gardens. These gardens are used to teach subjects ranging from environmental studies to nutrition, language arts, and math. Preliminary results from this and other studies indicate that an outdoor educational experience, such as that provided by a garden, significantly improved attendance, social interaction, and nutrition. The study also found that the greatest detriments to a successful school garden included lack of funding and supplies.

As another component of its school program, Zone 7 will work with its retail water supply agencies, educational consultants, and local educators to promote school gardens. Support can be provided in the form of supplies such as irrigation controllers or by technical assistance.

*School Information Program Promotes Water Conservation?* Zone 7 has been successfully administering its water science education programs in Dublin, Livermore and Pleasanton for the past three years. This program has a classroom presentation devoted solely to water conservation and focuses teaching water efficiency. The classroom exercises teach students simple methods they can use to reduce their water use by 5-10 gallons per day. This reduction comes from turning the water off while brushing teeth and washing hands, taking shorter showers, watering lawns for shorter times and earlier in the day, turning off the hose while washing cars, and reporting leaks and drippy faucets to their parents.

#### *Grades K-3...High School*

Zone 7 water science programs teach students to become stewards of our watershed by use of engaging demonstrations, hands-on activities and instruction targeted to meet state framework requirements. Classroom programs run 50 minutes and include appropriate grade-level printed materials from the Water Education Foundation, Zone 7 Water Agency and city water retailers. Teachers are also provided with a water resource directory for further exploration of water issues in their classroom, copies of our lesson plans and worksheets designed to measure subject matter retention and reinforce key terms and ideas.

#### *Number of presentations and students reached*

Over the past three years Zone 7 has completed over 220 classroom programs reaching approximately 6,500 students in the classroom.

#### *Zone 7's materials meet state education framework requirements*

Zone 7's programs meet state education framework requirements in the following areas: Life, Earth and Physical Sciences, Ecology and Biology, Earth and Life History, Shaping

the Earth’s Surface and Investigation and Experimentation.

Requirements for these areas are different at each grade level and are achieved by use of appropriate grade-level printed materials, instruction from a credentialed teacher and demonstration of key concepts.

*Methods used to evaluate this measure’s effectiveness.*

Every teacher is asked to complete a program evaluation after the classroom program. The evaluation judges the program based on how well the program meets state framework requirements, effectiveness of the instructor and materials presented and how engaged the students were during the presentation. Evaluations are reviewed monthly and adjustments are made to the programs when appropriate. Zone 7 also uses its presence at city science fairs to help measure program effectiveness. Students who have received a classroom presentation are encouraged to go to the Zone 7 demonstration booth at the city science fairs to complete a retention quiz. Data from the quizzes are compiled and reviewed. We motivate students to take the quiz by handing out free water bottles and other giveaways. Teachers often award extra credit to students who participate in the retention quiz as an additional incentive.

*Estimates of existing conservation savings on water use and the effect of such savings on the ability to further reduce demand.*

According to *Conserve Water* by the Watercourse and Wild Outdoor World, each person uses about 125 gallon of water per day. Students who participate in the programs can reduce their water use by 5-10 gallons per day. This reduction comes from turning the water off while brushing teeth and washing hands, taking shorter showers, watering lawns for shorter times and earlier in the day, turning off the hose while washing cars, and reporting leaks and drippy faucets to their parents.

$$6500 \text{ Students} \times 5\text{-}10 \text{ Gallons Per Day} = 32,500 - 65,000 \text{ gallons saved per day or } 11,862,500 - 23,725,000 \text{ gallons saved per year}$$

Zone 7 began its school education programs in September 2002.

Table 11. Zone 7 School Education Program.

ACTUAL	2002/03	2003/04	2004/05	2005/06	2006/07	2007/08	2008/09	2009/10
K-3	9	24	103	*	*	*	*	*
4 <sup>th</sup> – 6 <sup>th</sup>	18	23	5	*	*	*	*	*
7 <sup>th</sup> – 8 <sup>th</sup>	2	10	23	*	*	*	*	*
High School	3	6	6	6	6	6	6	6
Expenditures	\$52,000	\$52,000	\$52,000	\$52,000	\$52,000	\$52,000	\$52,000	\$52,000

\*Zone 7’s goal is to complete 120-150 classroom programs per year in grades K-8.

Implementation: Zone 7 will continue to implement this DMM.

**10.1.9 DMM 9 – Conservation Programs for Commercial, Industrial, and Institutional Accounts.**

*Implementation methods shall be at least as effective as identifying and contacting the top 10% of the industrial and commercial customers directly (by mail and/or telephone); offering audits and incentives sufficient to achieve customer implementation; and providing follow-up audits at least once every five years if necessary.*

Being a treated water wholesaler, Zone 7 prefers to work with retail water supply agencies rather than maintaining individual commercial, industrial, or institutional customer accounts. However, Zone 7 does have one account that can be classified as commercial and four accounts that fit the definition of institutional. Zone 7's sales to these accounts amounts to only a small fraction of total Zone 7 treated water deliveries. Zone 7 has not offered water conservation programs aimed specifically at CII accounts due to their low volume and because Zone 7 does not have the staff to implement such programs. In order to maximize existing resources, as well as ratepayer funds, Zone 7 has elected to focus its efforts on implementing water conservation programs that benefit the greatest number of people within the service area.

Future Implementation: In 2006, Zone 7 can examine water usage records of its few CII accounts to determine baseline water use. The CII account holders can be contacted and informed of services that Zone 7 can provide (water audits, low-flow plumbing fixtures, financial incentives for ULFT replacement).

#### **10.1.10 DMM 10 - Wholesale Agency Programs**

*Implementation shall consist of at least the following actions: Wholesale Water Agency shall provide conservation-related technical support and information; financial incentives, or equivalent resources; and, when mutually agreeable and beneficial, operate all or any part of the conservation-related activities which a given retail supplier is obligated to implement under the BMP's cost-effectiveness test.*

*(Water Code Section 10631(f), 1-J)*

Zone 7 provides financial (or equivalent resources) and technical support as appropriate, beneficial, and mutually agreeable to our retail water supply agencies in support of their water conservation efforts. Zone 7 also actively participates in some of the BMPs that are more regional in nature. To cite an example, Zone 7 implements BMP 6 (High Efficiency Washing Machine Rebates program) and offers a schools program that covers the entire service area.

Zone 7 also makes an effort to have the necessary staff and agency resources available to respond to retail agencies' requests involving their implementation of BMPs. For instance, Zone 7 assists retailing water supply agencies by participating in local public information/outreach events. Zone 7 works with California Water Services Company to staff a water education booth at the Livermore Wine Country Festival, with City of Pleasanton staff to stage Coastal Clean-up Day, and DSRSD staff during Dublin Pride Week.

As the water wholesaler for the Livermore-Amador Valley, Zone 7 supports its water supply retailing agencies' water conservation programs in two ways. First, by contributing direct financial assistance for their efforts in implementing BMPs. For instance, Zone 7 contributed some funding of a landscape audit conducted by one of its retail water supply agencies. To cite other examples, Zone 7 contributes up to \$8,000 per fiscal year towards retailer advertisement for the ULFT rebate program and it has purchased school education materials from the California Water Awareness Campaign for distribution in schools throughout the entire service area. Secondly, if a certain water conservation program is more regional in scope, Zone 7 will actively participate with its retailing water supply agencies, i.e. rebate programs for ULFTs and high efficiency

washing machine installation.

Implementation: Zone 7 is currently implementing and will continue to implement this DMM. Zone 7 offers support to its retail water supply agencies in their efforts to promote water conservation/water use efficiency.

**10.1.11 DMM 11- Conservation Pricing.**

*Implementation methods shall be at least as effective as eliminating non-conserving pricing and adopting conserving pricing. For signatories supplying both water and sewer, this BMP applies to pricing of both water and sewer service. Signatories that supply water but not sewer service shall make a good faith effort to work with sewer agencies so that those sewer agencies adopt conservation pricing for sewer service.*

*(Water Code Section 10631(f), 1-K)*

Zone 7 bills its retail water supply agencies on a commodity basis for metered water use. Individual retailers, for the most part, have retail pricing structures (such as tiered rate blocks) that encourage conservation.

Implementation: Zone 7 will continue to implement this DMM to the extent possible. However, to some degree, this DMM is more appropriately carried out by the retail agencies (see individual UWMPs submitted for the four retail urban water suppliers - Dublin-San Ramon Services District, City of Pleasanton, City of Livermore and California Water Service Company).

**10.1.12 DMM 12 – Water Conservation Coordinator.**

*Implementation methods shall be at least as effective as designating a water conservation coordinator responsible for preparing the conservation plan, managing its implementation, and evaluating the results. For very small water suppliers, this might be a part-time responsibility. For larger suppliers this would be a full-time responsibility with additional staff as appropriate. This work should be coordinated with the supplier's operations and planning staff.*

*(Water Code Section 10631(f), 1-L)*

Zone 7 began implementation in January, 1992, after the adoption of Zone 7 Board Resolution 1506. Currently, one staff person has been designated Water Conservation Coordinator and is responsible for the implementation of Zone 7's water conservation program. Some program components (such as the K – 8 school education program) are performed by outside contractors.

Percent Coordinator's Position	100 %
Coordinator's Name	Andrew Florendo
Coordinator's Title	Water Resource Technician
Coordinator's Experience	Designated Coordinator in 1996; Certified Landscape Auditor in 2003

Zone 7 has no foreseeable plans to upgrade its Water Conservation Coordinator to a full-time position or to add additional in-house Water Conservation Staff. The position will continue to be funded at the current rate.

CUWCC has not quantified water savings for this BMP.

Table12. Zone 7 Water Agency Conservation Coordinator

ACTUAL	2001	2002	2003	2004	2005
No. of Full-Time Positions	0	0	0	0	1
Full-time Equivalent	0.5	0.6	0.65	0.75	
Position supplied by other agency	0	0	0	0	0
Actual Expenditure *	\$60,000	\$61,000	\$62,000	\$63,000	\$65,000

\* Estimated Amount – Actual Expenditure is Included in the Overall Water Conservation Budget.

Implementation: Zone 7 is currently implementing and will continue to implement this DMM. Zone 7 offers support to its retail water supply agencies in their efforts to promote water conservation/water use efficiency.

### 10.1.13 DMM 13 - Water Waste Prohibitions

*Implementation methods shall be enacting and enforcing measures prohibiting gutter flooding, sales of automatic (self regenerating) water softeners, single pass cooling systems in new connections, non-recirculating systems in all new conveyer car wash and commercial laundry systems and non-cycling decorative water fountains.*

*(Water Code Section 10631(f), 1-M)*

Zone 7 has a water conservation clause in its contracts with its retailing water supply agencies which states, “Zone 7 will undertake and support water conservation programs. To that end, Zone 7 will develop, implement or participate in such programs and enter into agreements with Other Contractors, and other entities to make more efficient use of water supplies through water conservation programs so long as such agreements serve a beneficial purpose to the residents of Zone 7”.

Implementation: Not directly applicable to Zone 7 but the agency will support the DMM to the extent practical. Again, this DMM is more appropriately carried out by the retail agencies (see individual UWMPs submitted for the four retail urban water suppliers - Dublin-San Ramon Services District, City of Pleasanton, City of Livermore and California Water Service Company).

### 10.1.14 DMM 14- Residential Ultra-Low Flush Toilet Replacement Program

*An Implementation program for replacement of existing high-water-using toilets with ultra-low-flush toilets (1.6 gallons or less) in residential, commercial and industrial buildings shall be enacted. Such programs would be at least as effective as offering rebates of up to \$100 for each replacement that would not have occurred without the rebate, or requiring the replacement at time of resale, or requiring the replacement at the time of change of service.*

*(Water Code Section 10631(f), 1-N)*

Implementation of this program began in 1994. Since then approximately 12,000 ULFTs have been installed. This program is funded at \$50,000 per fiscal year. It is funded through the 2006-07 fiscal year and the program in its current configuration will expire after that time.

Zone 7, through its retail water supply agencies, offers participating customers up to a

\$75 rebate towards the purchase price of a new ULFT. Each of the retail water supply agencies in the Livermore-Amador Valley administers its own ULFT rebate program under the overall coordination and financial support of Zone 7.

Currently Zone 7 does not have a direct install or Community Based Organization distribution of ULFTs program. None of the cities within the Zone 7 service area have a toilet retrofit on resale ordinance.

Table 13. Zone 7 ULFT Rebate Program.

ACTUAL	FY 2000/01	FY 2001/02	FY 2002/03	FY 2003/04	FY 2004/05 (projected)	TOTAL
No. of Rebates Paid	858	623	625	504	500	12,000
Actual Expenditures *	\$63,200	\$45,200	\$49,000	\$38,000	\$40,000	\$875,300
Annual Water Savings (acre-feet) **	40	30	30	20	20	520

\*Amount spent on rebates only.

\*\* No. of ULFTs X 40 gals/day – based on three people and two ULFTs per household.

Although the current Zone 7 ULFT rebate program is successful, this program may need to be restructured to account for the fact that the only toilets available on the market are ULFTs. As a logical next step, Zone 7 is exploring the possibility of participating in a regional High Efficiency Toilet (HET) replacement program. As currently envisioned, this program would have a similar format to the successful Regional High Efficiency Clothes Washer Program.

Implementation: Zone 7 is currently implementing and will continue to implement this DMM.

## **10.2 Determination of DMM Implementation**

### Water Code

*Section 10631.5 The department shall take into consideration whether the urban water supplier is implementing or scheduled for implementation, the water demand management activities that the urban water supplier identified in its urban water management plan, pursuant to Section 10631, in evaluating applications for grants and loans made available pursuant to Section 79163. The urban water supplier may submit to the department copies of its annual reports and other relevant documents to assist the department in determining whether the urban water supplier is implementing or scheduling the implementation of water demand management activities.*

Zone 7 has reviewed the DMM implementation plan and determined that all of the applicable DMM's listed in the 2000 UWMP have been implemented as described. New commercial and industrial water use review is not being implemented because Zone 7 does not maintain individual commercial and industrial customer accounts (see individual retailer accounts). However, Zone 7 works with its retailers to encourage water use

efficiency in the design of new commercial, industrial, and institutional facilities, for example specifying the use of recycled water for landscape irrigation. In addition, Zone 7 tracks per capita use (see Figure 6, above) to determine effectiveness of DMM's and further reductions during drought periods.

## **11.0 PLANNED WATER SUPPLY PROJECTS AND PROGRAMS**

### *Water Code*

#### *Section 10631.*

*(h) Include a description of all water supply projects and water supply programs that may be undertaken by the urban water supplier to meet the total projected water use as established pursuant to subdivision (a) of Section 10635. The urban water supplier shall include a detailed description of expected future projects and programs, other than the demand management programs identified pursuant to paragraph (l) of subdivision (f), that the urban water supplier may implement to increase the amount of the water supply available to the urban water supplier in average, single-dry, and multiple-dry water years. The description shall identify specific projects and include a description of the increase in water supply that is expected to be available from each project. The description shall include an estimate with regard to the implementation timeline for each project or program.*

As the regional water wholesaler, Zone 7 has adopted a Water Reliability Policy (enclosed as Appendix B). The Policy guides Zone 7 into planning for future demands based on projected growth from regional planning agencies. Zone 7 plans water supply projects and their funding through a complex Capital Improvement Program. Some of these projects and programs have already been described in Chapter 8 (Table 8), above.

Zone 7's currently-planned water supply projects and programs are summarized in the following table. A graphical display of scheduling for planned Zone 7 water quality improvement projects can also be found in Appendix F.

Table 14. Zone 7 Water Agency Future Water Supply Projects

Project Name	Project Description	On Line Date	Size	Project Type
SBA Improvement & Enlargement	Enlargement of the SBA by DWR	2008	130 cfs	Conveyance
Well Master Plan Wells	Construction new water supply wells to meet 25% of Zone 7's future M&I demands	2021	7-9 new wells 25 mgd total	Production
Future Well 1	Well east of Mining Area	2007	3.5 mgd	Production
Future Well 2	New Well	2008	3.5 mgd	Production
Future Well 3	New Well	2009	3.5 mgd	Production
Future Well 4	New Well	2010	3.5 mgd	Production
DVWTP Improvement	Dissolved Air Flotation	2007	10 mgd DAFF	Production
Altamont Water Treatment Plant	Construction of a new water treatment plant	2009	24 mgd.	Production
Altamont Treatment Plant Phase 2	Expand Treatment Plant to 42 mgd	2016	18 mgd. expansion	Production
Altamont Pipeline	Transmission P/L Altamont to Cross-Valley P/L at Isabel	2009	12 miles of 42 inch pipe	Distribution
Groundwater In-lieu Banking Program	Groundwater Banking Program with Cawelo Water District	2008	10,000 AF/year 120,000 AF	Storage
High-Efficiency Toilet (HET) Replacement Program (3)	Replace older 1.6, 3.5, 5 gal/flush toilets with 1.0 gal/flush HET	2007	10,000 HET 0.5 mgd. demand reduction	Management
Mocho Wellhead Demineralization	Reverse Osmosis demineralization facility	2008	6 mgd.	Production
Future Wellhead Demineralization	Demineralization facilities at other well sites	2012	6 mgd.	Production

**Project Type.**

**Water:** Water is the water rights or source of raw water ( not extraction from storage)

**Storage:** Storage facility for Source Water storage inside watershed or outside watershed

**Conveyance:** Conveyance of source water into the watershed

**Production:** Production of treated water from Surface Water Treatment Plants or Wells.

Including treatment.

**Distribution:** The Distribution of Treated Water to retailers

**Management:** The coordination and management of supplies and facilities to meet demands.

Table 14.1 Zone 7 Water Supply Increase from new Projects

Project Name	Normal Year AF to Zone 7	Single Dry Year AF to Zone 7 (1)	Multi Dry Years AF to Zone 7 (1)		
			Year 1	Year 2	Year 3
Altamont Water Treatment Plant	47,000	2,350	2,350	2,350	2,350
Altamont Pipeline					
Groundwater In-lieu Banking Program	0	15,000	15,000	15,000	15,000
High-Efficiency Toilet (HET) Replacement Program (3)	560	560	560	560	560
SBA Improvement & Enlargement Project	50,000	2,500	2,500	2,500	2,500
Well Master Plan Wells	(2)	(2)	(2)	(2)	(2)
Wellhead Demineralization Project	(4)	(4)	(4)	(4)	(4)

(1) Dry year estimates assume 5% SWP delivery.

(2) Seven new water supply wells. 27 MGD ultimate capacity, adding 1-2 per year.

(3) Based on 50 gal/day water savings and 10,000 HET in Zone 7 service area.

Water savings are continuous.

(4) Project enables Zone 7 to meet its water quality goals by removing salts from the groundwater basin.

It will also allow for more recycled water use in the region.

## **12.0 DEVELOPMENT OF DESALINATED WATER**

*Water Code*

*Section 10631*

*(i) Describe the opportunities for development of desalinated water, including, but not limited to, ocean water, brackish water, and groundwater, as a long-term supply.*

Zone 7 Water Agency's planned demineralization projects are desalination projects which not only remove salt from the groundwater basin but also allow recycled water use to take place in the region. The water quality of the groundwater basin has been

consistent, averaging from 400 to 550 mg/l TDS. Zone 7 has developed a Salt Management Plan (SMP) for the Livermore-Amador Valley Groundwater Basin, which was incorporated by reference into the attached Groundwater Management Plan (GMP). The SMP examines the sources of increased salt loading as well as the best approach to mitigate those effects. One of the plan's goals call for offsetting an annual salt loading of 2,200 tons plus a projected 50 tons per year increased loading from recycled water by implementation of wellhead demineralization projects (coupled with exporting the brine concentrate out of the groundwater basin). The planned demineralization projects will also allow Zone 7 to meet its water quality goals and provide lower hardness water to its retail customers. These projects are explained in more detail in the GMP, incorporated herein by reference.

### **13.0 WATER SHORTAGE CONTINGENCY PLAN**

*Water Code*

*Section 10632. The Plan shall provide an urban water shortage contingency analysis that includes each of the following elements that are within the authority of the urban water supplier:*

- *Stages of action to be undertaken by the urban water supplier in response to water supply shortages, including up to a 50 percent reduction in water supply, and an outline of specific water supply conditions which are applicable to each stage.*

### **13.1 Stages of Action**

#### **13.1.1 Stage One: Partial Losses of Supply**

Stage One is defined as reductions in SBA deliveries that are less than 100%. Therefore, this stage includes a 50% supply shortage (since the SBA provides 70-75% of local supplies). If a scenario arises such that Zone 7 finds itself in an extended drought or any other situation in which water supply has been curtailed, Zone 7 is contractually obligated, under Section B, subsection 14 of its Municipal and Industrial Water Supply Contracts with its retailers, to “reduce deliveries to each Contractor in an amount that results in a reduction of total water used within that customer’s service area that is equal to the percent reduction for total water used within Zone 7’s service area for that year”.

Zone 7 has similar language in its “Terms and Conditions of Municipal & Industrial Water Service to the City of Pleasanton,” adopted August 16, 2000 by Resolution No. 00-2182. Specifically, Pleasanton’s Terms and Conditions state the “Zone 7 shall reduce deliveries to Each Contractor in an amount that results in a reduction of total water used within Contractor’s service area that is equal to the percent reduction for total water used within Zone 7’s service area for that year, all as determined by Zone 7.”

Zone 7 will determine total water demand in any given area and distribute the available supply accordingly. Thus, Zone 7 will reduce its deliveries so that all its M&I customers (the four retail water supply agencies) experience the water supply shortage equally, assuring that retailers that operate their own wells would not receive a greater percentage of water (including retailers’ pumping) than those that do not have access to groundwater resources.

Zone 7 has always taken the position that as a treated water wholesaler it will work closely with local retail water supply agencies to implement any urban water shortage contingency plan. The successful implementation of this Urban Water Shortage Contingency Plan depends on the ability of Zone 7 and its retail water supply agencies to operate in a cooperative environment. As part of this cooperative effort, Zone 7 relies on these water retailers to determine priorities for use of available water. Thus, specific demand reduction programs will be left to the retailers and their individual Urban Water Shortage Contingency Plans are referred to for detail in this area. The SWP Aqueduct outage in June 2001 demonstrates the effectiveness of this arrangement. Zone 7's Water Operation Planning and Analysis group in the Water Resources Section prepared daily water supply operations plans and coordinated production and delivery of SWP water during the month long outage.

As mentioned previously, Zone 7 will work to coordinate efforts among its four water retailing agencies (Dublin-San Ramon Services District, City of Livermore, City of Pleasanton and California Water Service Company) to ensure maximum efficiency of available supplies. As a result, due to the effective use of the groundwater basin, the Livermore-Amador Valley was able to essentially meet its 25% voluntary conservation goals set during the critically water short year of 1991, even though DWR was able to supply only 20% of Zone 7's requested deliveries.

Zone 7 factors into its Annual Operational Plans the possibility of a dry or critically dry year occurring with consequent reductions in SWP deliveries. Zone 7's Water Supply Reliability Policy calls for Zone 7 to provide full deliveries to all of its contractors even after two consecutive years with only 30% delivery from the SWP. This is possible because of Zone 7's long-term groundwater replenishment program. In effect, the groundwater basin is filled during normal and wet years so that the stored water can serve as a banked supply in times of drought. It is also possible because Zone 7 has purchased 65,000 AF of Out-of-Basin groundwater capacity. In effect, the Out-of-Basin storage water can be conveyed to Zone 7 via the SWP facilities to augment the very low SWP allocations. Effective planning has enabled Zone 7 to minimize deleterious effects from water shortages and still provide efficient service to the people within its service area.

If an extended drought were to occur, Zone 7 would adopt a policy in which it would not accept any new water connections. Water supply needs of its current customers will be addressed before provisions for any new water customers can be realized. A draft water shortage contingency resolution is included as part of Appendix A.

### **13.1.2 Stage Two: Catastrophic Loss of Major Supply**

In the event that, as a result of a catastrophic occurrence, Zone 7 had no SBA capacity (approximately a 70-75% reduction in regional water supply), it plans to operate its wells and make use of water stored in Lake Del Valle and conveyed to the Zone 7 Del Valle Water Treatment Plant, to still have the ability to meet 75% of its estimated maximum day M&I demands. Zone 7 would be able to make full deliveries to its retail water supply agencies for most of the year. During this period, Zone 7 can meet M&I demands using only its groundwater resources. In the peak summer months, Zone 7 would reduce deliveries so that all of its retailers received the equivalent monthly cutbacks. Under this scenario, since Zone 7 lacks the necessary conveyance systems, some untreated water customers would not receive water.

Since Zone 7 operates as a wholesale water agency, it has not adopted ordinances or imposed mandatory provisions restricting the use of water and does not set or enforce

consumption limits at the retail level. As a result, this contingency plan does not include per capita allotment, penalties, or incentives for conservation for any customer sector. The development of such mechanisms is left to the authority of the retail water supply agencies.

A draft water shortage contingency resolution is included as part of Appendix A.

**13.2 Three-Year Minimum Water Supply**

Water Code  
*Section 10632*  
 (b) *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.*

An estimate of the minimum water supply currently available to Zone 7 is presented in the following table. It is important to note that projects (such as finalizing the agreement with Cawelo) will improve water supply availability during the five-year planning horizon of the UWMP (see Section 16.0).

Table 15. Zone 7 Minimum Water Supply Availability Next Three Years. (Units in Acre-Feet)

SUPPLY SOURCE	Year 1 *	Year 2 *	Year 3 *
State Water Project *	16,930	16,930	29,210
Carryover	10,000	0	0
Semitropic Pumpback	9,780	9,780	11,200
Arroyo del Valle Watershed	480	4,560	6,720
Zone 7 Wells	23,230	29,150	13,300
BBID	2,000	2,000	2,000
<b>TOTAL</b>	<b>62,420</b>	<b>62,420</b>	<b>62,430</b>
<b>TOTAL 2012 DEMAND</b>	<b>61,000</b>	<b>61,000</b>	<b>61,000</b>

\* Based upon three driest hydrologic years, 1990 - 1992.

**13.3 Catastrophic Water Supply Interruption**

Water Code  
*Section 10632*  
 (c) *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.*

The Zone 7 Emergency and Safety Services Division has prepared an Emergency Operations Plan which deals with a catastrophic interruption of water supplies including, but not limited to, a regional power outage, an earthquake, or other disaster. Again, should such interruption still allow for some deliveries, a Stage Two Action will be

declared (see Section 13.1).The Agency also has an Emergency Operations Committee made up of personnel representing different skills and disciplines within Zone 7. The Committee trains regularly to maintain proficiency and would respond in the event of a natural or man-made emergency.

Basically, even if there were a total interruption of deliveries from the SBA, Zone 7 would be able to meet 75% of its current water demands with existing or planned facilities during non-summer months. Zone 7 would declare a Stage Two Action and reduce deliveries each month so that all of its retailers would receive equivalent monthly cutbacks during the summer months. Zone 7 allocations would be based on the retail water supply agencies that have wells to make full use of those wells. The retail water supply agencies would also begin emergency water conservation measures. Under this scenario, untreated water customers would receive no water.

In the event of a regional power outage, Zone 7 has mobile generators in place at selected facilities to protect against the effects of a widespread power failure resulting for instance from a major earthquake. Under this specific scenario, assuming no interruptions in surface water supply, Zone 7 would be able to provide service to all treated water contractors by running both surface water treatment plants on emergency generators. If warranted by demand, Zone 7 would also operate its Mocho wells which are equipped with emergency generators. Stoneridge and Hopyard wells could not be operated under this scenario since these wells employ larger 4100 volt motors versus the 480 volt motors at the Mocho wells. If the power failure were to occur during high demand season, Zone 7 would be unable to meet hourly peak demands throughout the distribution system. During the rest of the year, meeting demand would not be an issue until such time when average demand exceeds Zone 7's emergency capacity, although alternatives are under consideration and are likely to be implemented before this would occur.

### **13.4 Prohibitions During Water Shortages**

*Water Code*

*Section 10632 (d-f)*

*(d) Additional, mandatory prohibitions against specific water use practices during water shortages, including, but not limited to, prohibiting the use of potable water for street cleaning.*

*(e) 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.*

*(f) Penalties or charges for excessive use, where applicable.*

As mentioned previously, since Zone 7 operates as a wholesale water agency, it has not adopted ordinances or imposed mandatory provisions restricting the use of water and does not set or enforce consumption limits at the retail level, with the exception of reducing supplies to retailers and agricultural users as contractually set forth in customer contracts.

As a result, this urban water management plan does not include per capita allotment,

penalties, or incentives for conservation for any customer sector. The development of such mechanisms is assigned contractually to the retail water supply agencies (Dublin-San Ramon Services District, City of Pleasanton, City of Livermore, and California Water Service Company). More detailed descriptions of these measures can be found in the respective UWMPs. However, Zone 7 fully supports such actions by the retailers.

### **13.5 Impacts of Drought Actions on Revenues & Expenditures**

*Water Code*

*Section 10632*

*(g) An analysis of the impacts of each of the actions and conditions described in subdivision (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.*

Delivery reductions, as discussed in Section 13.1, above, result in revenue losses. In anticipation of such revenue losses, Zone 7 initiated a Drought Contingency Funding Program several years ago. In fact, Zone 7 maintains a number of reserve funds to ensure it can fund emergency expenses; cash flow requirements; capital improvement plans and future operating requirements while avoiding significant rate fluctuations due to changes in funding needs. It also maintains a cash reserve position that may be utilized to fund unexpected fluctuations in revenue and operating/capital expenditures.

The two funds that most specifically address this issue are the Emergency/Operating Reserves and the Rate Stabilization Fund. The Emergency/Operating Reserves are designated by the Zone 7 Board of Directors to provide for emergencies and cash flow requirements. The Rate Stabilization Fund is designated by the Board of Directors to provide funds in the case of an unforeseen event such as a drought. Zone 7 maintains a \$3 million Rate Stabilization Fund to offset losses in revenue and other unanticipated costs. This is a former drought surcharge and was incorporated into the regular water rate. The size of the fund is established to balance anticipated revenue losses from projected three-year delivery reductions. The Rate Stabilization Fund is planned to avoid impacts on expenditures.

### **13.6 Reduction Measuring Mechanisms**

The Urban Water Management Planning Act requires a mechanism for determining actual reductions in water use in response to conservation measures implemented under the Zone 7 Water Agency Water Shortage Contingency Plan.

Since Zone 7 operates as a wholesale water agency, it has not adopted ordinances or imposed mandatory provisions restricting the use of water and does not set or enforce consumption limits at the retail level. As a result, this contingency plan does not include per capita allotment, penalties, or incentives for conservation for any customer sector. The development of such mechanisms is left to the authority of the retail urban water suppliers.

However, Zone 7 has always taken the position that as a treated water wholesaler it will work closely with local retail water agencies to implement any urban water shortage contingency plan. It could adopt a response similar to the case of the SWP Aqueduct

outage in June 2001. During the month long outage, the Water Operations Planning and Analysis group in the Water Resources Section prepared daily operations plans and coordinated production and delivery of SWP water with the retailers.

Effectiveness of drought reduction measures is reflected in the graphing of per capita usage – as evidenced by the drop documented in 1991 when such measures were implemented (see Figure 6)

## **14.0 RECYCLED WATER PLAN**

### Water Code

*Section 10633. The Plan shall provide, to the extent available, information on recycled water and its potential for use as a water source in the service area of the urban water supplier. The preparation of the plan shall be coordinated with local water, wastewater, groundwater, and planning agencies that operate within the supplier's service area and shall include the following:*

### **14.1 Coordination**

Zone 7 Water Agency does not currently produce or distribute recycled water. Recycled water treatment and distribution is managed by two agencies within the Zone 7 Water Agency service area; the City of Livermore and Dublin San Ramon Services District. Details regarding the two local recycled water programs are available in the UWMP's prepared by the City of Livermore and DSRSD.

Recognizing that recycled water is already a part of the region's complete and balanced water supply and storage management program, Zone 7 has incorporated its use by the water retailers into future valley-wide water supply planning. In 1992, Zone 7 in conjunction with DSRSD and the City of Livermore, conducted a valley-wide water recycling study which found that recycled water can provide a safe and cost effective source of water supply. The Zone 7 Board has committed the agency to continually supporting the search for safe, economically feasible and publicly-acceptable methods to increase local water resources by maximizing the use of recycled water and to continue to work cooperatively with DSRSD and Livermore towards that end. Furthermore, Zone 7 is a co-permittee under the Master Waste Reuse Permit issued by RWQCB in December 1993 (Order No. 93-159).

This permit required development of a Salt Management Plan, to assess cumulative salt loading impacts on the groundwater basin. The Salt Management Plan identified demineralization with export of the rejected/brine stream as a means of mitigating salt loading. The Salt Management Plan has been incorporated into the Groundwater Management Plan which has, in turn, been incorporated into the UWMP by reference. The first phase is currently under design. Loss of the quantity of reject/brine water from the basin should be less than the recycled water supply facilitated by the project. The project has the added value of improving water quality delivered to customers.

Again, two wastewater agencies exist within Zone 7's service area, namely, DSRSD and City of Livermore. Both of these agencies currently provide recycled water to some of their customers for non-potable uses, in particular for landscape irrigation. Details of each

agency's treatment and distribution are reported in their respective UWMPs.

DSRSD's Ordinance 301 requires, with few exceptions, all new developments to include separate piping for recycled water, whenever feasible. As new development occurs, the demand for recycled water will increase. When economically viable, DSRSD will convert existing areas to recycled irrigation. DSRSD has also formed several partnerships, offers financial incentive to promote the use of recycled water and has been very proactive in reaching out to the public. The DSRSD outreach program includes newsletters, videos, speaker bureaus, brochures, specific events, school education and classroom programs and meetings with focus groups.

In 2001, the City of Livermore planned on building a recycled water pipeline to irrigate large turf and landscape areas at parks and schools as a way to increase recycled water use. There were also plans to release reverse-osmosis (RO) treated recycled water into an existing groundwater recharge facility. These plans were made in coordination with Zone 7 and other planning agencies. However, these plans have been put on hold due to lack of funding.

The City of Livermore has been complying with 1991 legislation by installing purple pipe in all new landscaping irrigation systems. This effort is a pro-active approach to construct a dual service system in preparation for future expansions to recycled water conveyance facilities.

#### **14.2 Wastewater Quantity, Quality and Current Uses**

*Water Code*

*Section 10633 (a-c)*

*(a) A description of the wastewater collection and treatment systems in the supplier's service area, including a quantification of the amount of wastewater collected and treated and the methods of wastewater disposal.*

*(b) A description of the quantity of treated wastewater that meets recycled water standards, is being discharged, and is otherwise available for use in a recycled water project.*

*(c) A description of the recycled water currently being used in the supplier's service area, including, but not limited to, the type, place, and quantity of use.*

Zone 7 does not collect, treat or distribute wastewater. While Zone 7 does have the authority for wastewater management, this function is carried out by two of Zone 7's retailers namely, Dublin-San Ramon Services District (DSRSD) and the City of Livermore. These two agencies collect all of the wastewater produced within the city limits of Pleasanton, Dublin and Livermore and portions of San Ramon. Wastewater transport out of the area is handled through the Livermore-Amador Valley Water Management Agency (LAVWMA). This is a joint powers agency comprised of the DSRSD along with the Cities of Livermore and Pleasanton. Since 1979, LAVWMA has owned the conveyance facilities that ship treated wastewater from the treatment plants west over the Dublin grade, and eventually to the East Bay Discharge Authority which de-chlorinates the effluent and discharges it through a deepwater pipeline into San Francisco Bay. DSRSD is also a member of the DSRSD-EBMUD Regional Water

Authority, a recycled water Joint Powers Authority.

Currently, recycled water is used for landscape irrigation at various sites throughout the Zone 7 service area. There are no firm plans for other uses in the foreseeable future, although various portions (such as groundwater recharge) are under consideration.

In Livermore, tertiary treated wastewater is used to irrigate the City’s Municipal Golf Course, Las Positas College and the business parks along the north side of I-580. The City of Livermore has been irrigating its golf course with recycled water since the 1960's. In the City of Livermore, recycled water use has grown to 800 AFA.

In 1999, DSRSD began supplying tertiary-treated recycled water from its Microfiltration, Ultraviolet, and Sand Filtration-Ultraviolet facilities for landscape irrigation to its first customer, the Dublin Sports Grounds. For 2005, recycled water demand in the DSRSD service area is projected to be approximately 2,000 AFA (2005 DSRSD Urban Water Mgt Plan).

For details of wastewater collection and treatment systems, quantities treated, excess recycled water capacity not currently being distributed to non-potable customers, and type, place and quantity of use, refer to the UWMP’s presented by DSRSD and the City of Livermore and Pleasanton. A summary of the quantity of wastewater and recycled water is presented in table 15a.

Table 15a. Regional Wastewater Background and Projections, 2000-2025 (AFY)

<i>Year</i>	<i>Wastewater Collected &amp; Treated in Service Area</i>	<i>Quantity of Wastewater Further Treated For Unrestricted Use &amp; Distributed as Recycled Water</i>	<i>Excess Wastewater Exported to SF Bay</i>
2000	16,900	600	16,300
2005	20,400	2,700	17,700
2010	22,400	4,000	18,400
2015	25,100	5,100	20,000
2020	26,200	5,900	20,300
2025	28,200	5,900	22,300
2030	29,000	5,900	23,100

### **14.3 Potential and Projected Use, Optimization Plan with Incentives**

*Water Code*

*Section 10633 (d-g)*

*(d) A description and quantification of the potential uses of recycled water, including, but not limited to, agricultural irrigation, landscape irrigation, wildlife habitat enhancement, wetlands, industrial reuse, groundwater recharge, and other appropriate uses, and a determination with regard to the technical and economic feasibility of serving those uses.*

*(e) The projected use of recycled water within the supplier's service area at the end of 5, 10, 15, and 20 years, and a description of the actual use of recycled water in comparison to uses previously projected pursuant to this subdivision.*

*(f) A description of actions, including financial incentives, which may be taken to encourage the use of recycled water, and the projected results of these actions in terms of acre-feet of recycled water used per year.*

*(g) A plan for optimizing the use of recycled water in the supplier's service area, including actions to facilitate the installation of dual distribution systems, to promote recirculating uses, to facilitate the increased use of treated wastewater that meets recycled water standards, and to overcome any obstacles to achieving that increased use.*

Within Zone 7's service area, there are a number of potential uses for recycled water including agricultural and landscape irrigation, fire protection, industrial use, construction, wetlands and other miscellaneous uses. Some of these are already in existence while others like agricultural irrigation have not yet been implemented because the infrastructure has not been built to accommodate such use. Currently, there is a demand for more than 4,000 AFA in agricultural and turf/landscape irrigation. Although this demand and technology exist, the source of revenue to make it a reality does not.

As the groundwater basin management agency, Zone 7 is cognizant of the potential salt-loading impacts arising out of recycled water use. Zone 7 has taken a pro-active approach to attenuate and mitigate salt-loading within the basin (see attached Groundwater Management Plan). As discussed in Zone 7's Groundwater Management Plan, Zone 7's Salt Management Plan (May, 2004) addresses the sources of increased salt loading and the best approach to mitigate these effects. Currently, Zone 7 is engaged in the design of a demineralization facility to balance the salt loading in the groundwater basin by removing and exporting the both the existing salt in the basin and the projected future salt loading. The demineralization project will also make it possible to provide softer water to Zone 7's potable water customers in the western portion of Zone 7's service area where there is a regional concentration of groundwater production facilities.

Zone 7, recognizing that recycled water will be a part of a complete and balanced water supply and storage management program, has incorporated its use in future water supply planning. In joint efforts with DSRSD and the City of Livermore, Zone 7 plans to continually support the search for safe, economically feasible and publicly acceptable methods to increase local water resources by maximizing the use of recycled water.

## **15.0 WATER QUALITY IMPACTS ON RELIABILITY**

### *Water Code*

#### *Section 10634*

*The plan shall include information, to the extent practicable, relating to the quality of existing sources of water available to the supplier over the same five-year increments as described in subdivision (a) of Section 10631, and the manner in which water quality affects water management strategies and supply reliability.*

Zone 7 does not anticipate that water quality will negatively impact its ability to provide a reliable supply of water over the next 20 years, although water quality is certainly a consideration in water supply planning. For instance, although a certain percentage of groundwater will be “lost” by the demineralization projects discussed above (i.e., through export of concentrate or reject streams from reverse osmosis facilities), this water quality/salt balance consideration allows recycled water use in the area and the associated increased salt loading on the basin. Therefore, as long as the volume of concentrate exported out of the area is less than the volume of recycled water, the overall effect is a gain in regional water supplies without any overall impact on water quality.

Surface water from the State Water Project is expected to be provided into the future per DWR’s most recent SWP Table A. The long-term average SWP delivery is 77% and the minimum is 5% of each contractor’s SWP allocation. Local water supply from Lake Del Valle is expected to remain steady as long as hydrology remains within normal limits. The water quality in the Livermore-Amador Valley Groundwater Basin is expected to improve when currently planned projects come on line.

Groundwater Demineralization facilities are planned for completion in 2008, 2012 and 2015, respectively, with a total ultimate treatment capacity of 16 to 18 MGD. The first of these, a reverse osmosis (RO) plant with a 7.7 MGD capacity, has received approval from both DSRSD and Zone 7 Boards. These facilities will help to maintain the groundwater basin’s reliability by balancing the salt loading. The net salt removal will exceed the salt loading in the basin thus improving water quality. Without this type of intervention, parts of the Main Basin would exceed the limits of recommended mineral content thereby losing reliability.

Zone 7’s approach to maintaining a sustainable and reliable water supply with good water quality has been (and will continue to be) to maximize surface water deliveries, artificially recharge the Main Basin with imported surface water, expand recharge facilities, restrict groundwater pumping, and properly manage use of recycled water. As mentioned above, a Salt Management Plan was originally planned to control salt loading from recycled water but was expanded to solve the entire salt loading problem. In the process the SMP has shaped the water operations plan into a tool to maintain, or where feasible, to improve Zone 7 delivered treated water quality. Groundwater demineralization and the export of salts from RO plants, along with surface water recharge of the groundwater basin, are the key components of the SMP. These programs are discussed in more detail in the attached Groundwater Management Plan, incorporated herein by reference.

## **16.0 WATER SERVICE RELIABILITY**

### *Water Code*

#### *Section 10635*

*(a) Every urban water supplier shall include, as part of its urban water management plan, an assessment of the reliability of its water service to its customers during normal, dry, and multiple dry water years. This water supply and demand assessment shall compare the total water supply sources available to the water supplier with the 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. The water service reliability assessment shall be based upon the information compiled pursuant to Section 10631, including available data from state, regional, or local agency population projections within the service area of the urban water supplier.*

*(b) The urban water supplier shall provide that portion of its urban water management plan prepared pursuant to this article to any city or county within which it provides water supplies no later than 60 days after the submission of its urban water management plan.*

*(c) Nothing in this article is intended to create a right or entitlement to water service or any specific level of water service.*

*(d) Nothing in this article is intended to change existing law concerning an urban water supplier's obligation to provide water service to its existing customers or to any potential future customers.*

Note that in addition to the goals stated above (see Chapter 7), Zone 7 has a number of planning and operational criteria, which are associated with the Board Water Supply Reliability Resolution and are as follows:

1. Provide surface water treatment design capacity to meet 85 percent of the Zone 7 maximum day demand for reliability and operational flexibility.
2. Operate water supplies so that the groundwater basin levels do not drop below historic lows.

Zone 7's normal water year supply is based on the annual Sustainable Water Supply Report and includes sources of water from State Water Project, water transfers, local and external groundwater as well as local surface water. The Current Sustainable Water Supply is 88,400 AF considering the most recent SWP average delivery from DWR's Table A. This amount is expected to remain relatively constant during the next 20 years unless average year deliveries change on SWP Table A. Zone 7's normal water year demand is expected to increase per Table 16 from 47,550 AFA in 2005 to 69,370 AFA in 2030.

Table 16. Zone 7 Total Annual Demand, 2005-2030. Units in acre-feet.

ZONE 7 DEMANDS BY YEAR	2005	2006	2007	2008	2009	2010	2015	2020	2025	2030
TREATED, AF	43,650	45,120	46,190	47,270	48,290	49,370	57,240	59,110	60,960	61,120
UNTREATED, AF	3,900	4,300	4,410	4,540	4,720	8,250	8,250	8,250	8,250	8,250
TOTAL ANNUAL DEMAND	47,550	49,420	50,600	51,810	53,010	57,620	65,490	67,360	69,210	69,370

The available water supply to Zone 7 for the single critical dry year is presented in Tables 17 for current conditions through about 2012. Table 18 depicts available supplies after Zone 7 obtains Out-of-Basin storage in Cawelo. This will allow Zone 7 to meet worst case single year drought demands through 2030. Zone 7's available water supply for a multiple year (six-year) drought is shown in Tables 19 for current conditions through about 2012. Table 20 shows available supplies after Zone 7 obtains Out-of-Basin storage in Cawelo. The available water supply presented in those tables are based upon Zone 7 model results over a 77-year hydrologic record. The model results verify the water supply from Zone 7 available sources, including State Water Project (Table A), Carryover, Out-of-Basin Storage Pumpback, Local Watershed (Lake Del Valle), local groundwater basin, and Out-of-Basin Supply (BBID).

Table 17. Zone 7 Minimum Water Supply for a Single Dry Year, 2005-2012

SUPPLY SOURCE	Year 1 *
State Water Project *	4,030
SWP - Carryover	20,000
Semitropic Pumpback	8,170
Arroyo del Valle Watershed	20
Zone 7 Wells	28,200
BBID	2,000
<b>TOTAL</b>	<b>62,420</b>
<b>TOTAL 2012 DEMAND</b>	<b>61,000</b>

\* Based upon the driest hydrologic year (1977).

Table 18. Zone 7 Minimum Water Supply for a Single Dry Year, 2013-2030

SUPPLY SOURCE	Year 1 *
State Water Project *	4,030
SWP - Carryover	20,000
Semitropic Pumpback	8,170
Cawelo Pumpback	10,000
Arroyo del Valle Watershed	20
Zone 7 Wells	28,200
BBID	2,000
<b>TOTAL</b>	<b>72,420</b>
<b>TOTAL 2030 DEMAND</b>	<b>69,370</b>

\* Based upon the driest hydrologic year (1977).

Table 19. Zone 7 Minimum Water Supply Availability for a Six-Year Drought between 2005-2012

SUPPLY SOURCE	Year 1 *	Year 2 *	Year 3 *	Year 4 *	Year 5 *	Year 6 *
State Water Project	66,280	8,060	69,420	16,930	16,930	29,210
SWP - Carryover	10,000	10,000	0	10,000	0	0
Semitropic Pumpback	0	8,680	8,150	9,780	9,780	11,200
Arroyo del Valle Watershed	380	290	4,290	480	4,560	6,720
Zone 7 Wells	17,000	33,400	17,000	23,230	29,150	13,300
BBID	2,000	2,000	2,000	2,000	2,000	2,000
<b>TOTAL</b>	<b>95,660</b>	<b>62,430</b>	<b>100,860</b>	<b>62,420</b>	<b>62,420</b>	<b>62,430</b>
<b>TOTAL DEMAND (2012)</b>	<b>61,000</b>	<b>61,000</b>	<b>61,000</b>	<b>61,000</b>	<b>61,000</b>	<b>61,000</b>

\* Based upon six driest hydrologic years, 1987 - 1992.

Table 20. Zone 7 Minimum Water Supply Availability for a Six-Year Drought between 2013-2030

SUPPLY SOURCE	Year 1 *	Year 2 *	Year 3 *	Year 4 *	Year 5 *	Year 6 *
State Water Project	66,280	8,060	69,420	16,930	16,930	29,210
SWP - Carryover	10,000	10,000	0	10,000	0	0
Semitropic Pumpback	0	8,680	15,480	9,780	9,780	11,200
Cawelo Pumpback	0	10,000	0	10,000	10,000	10,000
Arroyo del Valle Watershed	380	290	4,290	480	4,560	6,720
Zone 7 Wells	17,000	30,730	17,000	20,560	26,480	10,630
BBID	2,000	2,000	2,000	2,000	2,000	2,000
<b>TOTAL</b>	<b>95,660</b>	<b>69,760</b>	<b>108,190</b>	<b>69,750</b>	<b>69,750</b>	<b>69,760</b>
<b>TOTAL DEMAND (2030)</b>	<b>69,370</b>	<b>69,370</b>	<b>69,370</b>	<b>69,370</b>	<b>69,370</b>	<b>69,370</b>

\* Based upon six driest hydrologic years, 1987 - 1992.

## **17.0 UWMP ADOPTION & IMPLEMENTATION**

### Water Code

*Section 10640. Every urban water supplier required to prepare a plan pursuant to this part shall prepare its plan pursuant to Article 2 (commencing with Section 10630).*

*The supplier shall likewise periodically review the plan as required by Section 10621, and any amendments or changes required as a result of that review shall be adopted pursuant to this article.*

*10641. An urban water supplier required to prepare a plan may consult with, and obtain comments from, any public agency or state agency or any person who has special expertise with respect to water demand management methods and techniques.*

*10642. Each urban water supplier shall encourage the active involvement of diverse social, cultural, and economic elements of the population within the service area prior to and during the preparation of the plan. Prior to adopting a plan, the urban water supplier shall make the plan available for public inspection and shall hold a public hearing thereon. Prior to the hearing, notice of the time and place of hearing shall be published within the jurisdiction of the publicly owned water supplier pursuant to Section 6066 of the Government Code. The urban water supplier shall provide notice of the time and place of hearing to any city or county within which the supplier provides water supplies. A privately owned water supplier shall provide an equivalent notice within its service area. After the hearing, the plan shall be adopted as prepared or as modified after the hearing, as amended by the Act that adds this section, in determining whether the urban water supplier is eligible for funds made available pursuant to any program administered by the department.*

*10643. An urban water supplier shall implement its plan adopted pursuant to this chapter in accordance with the schedule set forth in its plan.*

*10644. (a) An urban water supplier shall file with the department and any city or county within which the supplier provides water supplies a copy of its plan no later than 30 days after adoption. Copies of amendments or changes to the plans shall be filed with the department and any city or county within which the supplier provides water supplies within 30 days after adoption.*

*(b) The department shall prepare and submit to the Legislature, on or before December 31, in the years ending in six and one, a report summarizing the status of the plans adopted pursuant to this part. The report prepared by the department shall identify the outstanding elements of the individual plans. The department shall provide a copy of the report to each urban water supplier that has filed its plan with the department. The department shall also prepare reports and provide data for any legislative hearings designed to consider the effectiveness of plans submitted pursuant to this part.*

*10645. Not later than 30 days after filing a copy of its plan with the department, the urban water supplier and the department shall make the plan available for public review during normal business hours.*

Zone 7 has taken all the required steps in adopting this UWMP, for example:

1. A copy of the adoption resolution is attached to this UWMP.
2. Zone 7 has reviewed the DMM implementation plan and determined that all of the applicable DMM's listed in the 2000 UWMP are being implemented. New commercial and industrial water use review is not being implemented because Zone 7 does not maintain individual commercial and industrial customer accounts (see individual retailer accounts). However, Zone 7 works with its retailers to encourage water use efficiency in the design of new commercial, industrial, and institutional facilities, for example specifying the use of recycled water for landscape irrigation.

Zone 7 did not include an overview of recycled water programs in the 2000 UWMP but has included one in 2005 (again, see individual retailer UWMPs for additional detail).

3. Zone 7 did not include a Groundwater Management Plan (GMP) in its 2000 UWMP but has incorporated its GMP into the 2005 UWMP by reference.
4. Zone 7 will provide its 2005 UWMP to DWR, its four major retail contractors, the City of Dublin, and Alameda County within 30 days of adoption.
5. Zone 7 recognizes that it must file copies of amendments or changes to the 2005 UWMP with DWR and contractors within its service area within 30 days of adoption.
6. Zone 7 will make the 2005 UWMP available for public review within 30 days of filing it with DWR.
7. Zone 7 continually encourages the involvement of all stakeholders in the affairs of water management. Zone 7 meets regularly with its major retail contractors and solicits input on a variety of tasks. Each month, Zone 7 holds a Board meeting in which the public is invited to participate and comment on issues related to the conduct of Zone 7's business. Zone 7 has contracts with public relations consultants to ensure that the public is both heard and well informed. In addition, Zone 7 maintains a website containing key reports for public use and to make available contacts within the agency should there be any issues. Zone 7 publishes a newsletter, "Waterways" and uses it as a communication tool for all customers within its service area. Zone 7 will hold a public hearing on its 2005 UWMP and will notify all stakeholders involved using standard modes of notification.

## **ACRONYMS AND DEFINITIONS**

ACWD- Alameda County Water District

AF/af – acre feet

AFA/afa – acre-feet per annum

BBID – Byron-Bethany Irrigation District

BMPs – Best Management Practices

CALFED – California-Federal Delta Bay Program

CCWD – Contra Costa Water District

CII – Commercial, Industrial, & Institutional

CIMIS – California Irrigation Management Information System

CoVWR – Committee of Valley Water Retailers

CUWCC – California Urban Water Conservation Council

CWS – California Water Service Company

DERWA - DSRSD-EBMUD Recycled Water Authority

DMM – Demand Management Measures

DSRSD - Dublin San Ramon Services District

DWR – Department of Water Resources

EBMUD – East Bay Municipal Utilities District

ETo - Evapotranspiration

GMP – Groundwater Management Plan

HET – High Efficiency Toilet

LAVWMA - Livermore-Amador Valley Water Management Agency

MGD – Million Gallons per Day

M&I – Municipal and Industrial

MOU – Refers to the Memorandum of Understanding Regarding Urban Water Conservation in California

RWQCB – Regional Water Quality Control Board

SBA- South Bay Aqueduct

SCVWD - Santa Clara Valley Water District

SMP – Salt Management Plan

SWP – State Water Project

TWRG – Tri-Valley Water Retailers Group –Staff group to support CoVWR

UWMP – Urban Water Management Plan

## REFERENCES

California Water Service Company, *Urban Water Management for the Livermore District*, 2000 Update

CH2MHill, *Draft Report – Well Master Plan*, October 2003.

Environmental Sciences Associates (ESA), *Draft Zone 7 Water Agency Water Supply Planning Program – Program Environmental Impact Report*, January 1999.

EOA, Inc, *Zone 7 Salt Management Plan*, May 2004.

Jones & Stokes, *Draft Groundwater Basin Management Plan for Livermore-Amador Groundwater Basin*, July 2005

Maddaus Water Management and City of Pleasanton, *Urban Water Management Plan – City of Pleasanton*, August 2002.

Raines, Melton & Carella, Inc. (RMC), *Zone 7 Water Conservation Program Evaluation*, February 2003.

Redoak Consulting, *Zone 7 Emergency Operations Plan*, August 2004.

Water Transfer Associates, *Zone 7 Water Agency Water Supply Planning Study Update*, February 1999.

West Yost & Associates, *Dublin San Ramon Services District – Final Urban Water Management Plan*, May 2005.

Zone 7 Water Agency, *Annual Sustainable Water Supply*, August 2005

# APPENDICES

APPENDIX A ..... Zone 7 Board Resolutions 06-2797 Approving and Adopting the Urban Water Management Plan and the Water Shortage Contingency Plan. Zone7 Board Resolution 06-2802 Approving submittal of additional factual information to supplement the UWMP.

APPENDIX B.....Zone 7 Revised Reliability Policy for Municipal and Industrial Water Supplies

APPENDIX C.....Zone 7 Board Resolution 1506

APPENDIX D ..... Zone 7 Emergency Operations Plan

APPENDIX E.....Executive Summary, Zone 7 Water Conservation Program Evaluation

APPENDIX F.....Water Quality Capital Improvement Projects, 2005-2015

APPENDIX G .....2005 Urban Water Management Plan "Review for Completeness" Form