



Urban Water Management Plan 2005 Update

Adopted June 13, 2006

BROWN AND
CALDWELL

Park Water Budget Program



Pre-Rinse Spray Valve Program



Clothes Washer Rebate Program



ET Controller Pilot Program



Managing Peak Well Demands

CITY OF DAVIS
FINAL DRAFT
URBAN WATER MANAGEMENT PLAN
2005 UPDATE

March 2006

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CHAPTER 1

INTRODUCTION

This Urban Water Management Plan (Plan) addresses the City of Davis (City) water system and includes a description of the water supply sources, magnitudes of historical and projected water use under differing demand conditions, and discusses reclamation and water conservation activities.

The remainder of this chapter provides an overview of the Plan, resource maximization and import minimization, public participation, details on Plan adoption, agency coordination, and Plan organization.

1.1 Urban Water Management Planning Act

The Plan has been prepared in accordance with the Urban Water Management Act (Act). The Act is defined by the California Water Code, Division 6, Part 2.6, and Sections 10610 through 10657. The Act became part of the California Water Code with the passage of Assemble Bill 797 during the 1983-1984 regular session of the California legislature. The Act requires every urban water supplier providing water for municipal purposes to more than 3,000 connections or supplying more than 3,000 acre-feet of water annually to adopt and submit a plan every five years to the California Department of Water Resources (DWR). Subsequent assembly bills have amended the Act. This Plan serves as a long-range planning document for water supply. The City's previous Plan was adopted by City Council in September 2001.

1.2 Resource Maximization and Import Minimization

Water management tools have been used by the City to maximize water resources. The City has developed several documents to help maximize water resources, including several reports that have been prepared in the past decade that address water supply and demand for the City. An understanding of the results of these previous studies provides a broader context for preparing an updated water supply plan for the future. This section provides a list of these recent planning reports. These documents are also referenced throughout this Plan.

- Future Water Supply Study (Montgomery Watson/West Yost, 1996)
- Deep Aquifer Study (West Yost, 1998)

- Water System Audit (Brown and Caldwell, 1999)
- Water Rate Study Update (Brown and Caldwell, 2000/2001)
- City of Davis and UC Davis Joint Water Supply Feasibility Study (West Yost, Sept 2002)
- Status Report on Municipal Wastewater Treatment Facilities (City of Davis Department of Public Works, March 2003)
- Final Environmental Impact Report: Davis Well Capacity Replacement (Winzler & Kelly Consulting Engineers, July 2005)
- Hydrogeologic Conceptualization of the Deep Aquifer. Prepared for the University of California, Davis (Luhdorff and Scalmanini Consulting Engineers, May 2003)
- Phase II Deep Aquifer Study (Brown and Caldwell, 2005)

1.3 Public Participation

As required by the Act, prior to adopting this Plan, the City made the Plan available for public review and comment and held a public hearing. Notices of public meetings were published in the local newspaper and posted on the City's homepage on the internet. Legal public notices for each meeting were published in the local newspapers and posted at City facilities with high public patronage. Copies of the public hearing notices are included in Appendix A. The hearings provided an opportunity for the City's customers as well as all residents and employees in the service area to learn about the water supply situation and the plans for providing a reliable, safe, high-quality water supply for the future.

The City has actively encouraged community participation in the development of its urban water management planning efforts since the first plan was completed in 1990; likewise, public meetings were held for the 1990, 1995, and 2000 plans.

For this 2005 update to the Urban Water Management Plan, public meetings included a review of the document at the March 2005 Natural Resources Commission (NRC) meeting, and a review and adoption by City Council in April 2005. A copy of the adopted resolution is provided in Appendix B. The Natural Resources Commission reviewed customer rebate programs and funding issues at the NRC meeting prior to reviewing the draft document and sending the Plan comments to the City Council for their review. Following City Council adoption, this Plan was submitted to the California

Department of Water Resources. The adopted Plan is available in the local library publications section, as well as on the City's website as a Department of Public Works link.

1.4 Agency Coordination

The Act requires the City to coordinate the preparation of its plan with other appropriate agencies in the area, including other water suppliers that share a common source, water management agencies, and relevant public agencies, to the extent practicable.

The City is a member agency of the Water Resources Association of Yolo County (WRA). The City regularly coordinates with WRA member agencies (both urban and agricultural) on projects of mutual interest and communicates City water-related actions both during and between regular WRA Board meetings. WRA members will be encouraged to review and comment on the City's 2005 Urban Water Management Plan Update at the April 2006 WRA Board Meeting. The agencies that were encouraged to review and comment on this plan were as follows:

- University of California at Davis
- City of Woodland
- Yolo County
- Yolo County Flood Control and Water Conservation District
- Dunnigan Water District
- City of Winters
- City of West Sacramento.

The following is a list of groups who participated in the development of this Plan:

- Mayor/City Council
- Natural Resources Commission
- Public Works Director and Staff
- Planning Department
- Local Wastewater Treatment Staff
- Local Flood Control Agency and Staff

- Other local, basin-wide, regional, state and federal agencies with shared water supplies and/or neighboring water interests
- State Senators and State Assembly Members, and U.S. Congressional members who represent this service area (indicate their District numbers)
- Members of the public, advisory groups, etc.

Table 1-1 summarizes the efforts the City has taken to include additional agencies and citizens in its planning and preparation process.

1.5 Plan Organization

This section provides a summary of the chapters in the Plan. Chapter 2 provides a description of the service area, climate, water supply facilities, and transmission system. Chapter 3 presents historical and projected water use. Surface and groundwater supplies are described in Chapter 4. Chapter 5 describes recycled water use in the City. Chapter 6 addresses water conservation. Chapter 7 provides a comparison of future water supply to demand and explains the City's water shortage conditions and policies. Various appendices provide relevant supporting documents.

Table 1-1. (DWR Table 1) Coordination with Appropriate Agencies

	University of California at Davis	City of Woodland	Yolo County	Yolo County Flood Control and Water Conservation District	Dunnigan Water District	City of Winters	City of West Sacramento.	Natural Resources Commission	Mayor/City Council	Public Works Director and Staff	Planning Department	Local Wastewater Treatment Staff	Local Flood Control Agency	State Senators and State Assembly Members, and U.S. Congressional members who represent this service area (indicate their District numbers)	Members of the public, advisory groups, etc.
Participated in developing the plan								✓	✓	✓	✓	✓	✓		✓
Commented on the draft								✓							
Attended public meetings															
Was contacted for assistance	✓		✓				✓				✓	✓	✓		✓
Was sent a copy of the draft plan	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
Was sent a notice of intention to adopt															
Not Involved / No Information														✓	

CHAPTER 2

DESCRIPTION OF EXISTING WATER SYSTEM

This chapter describes the City's water system. It contains a description of the service area and the water supply facilities, including groundwater wells, surface water supply facilities, storage reservoirs, and the piping system.

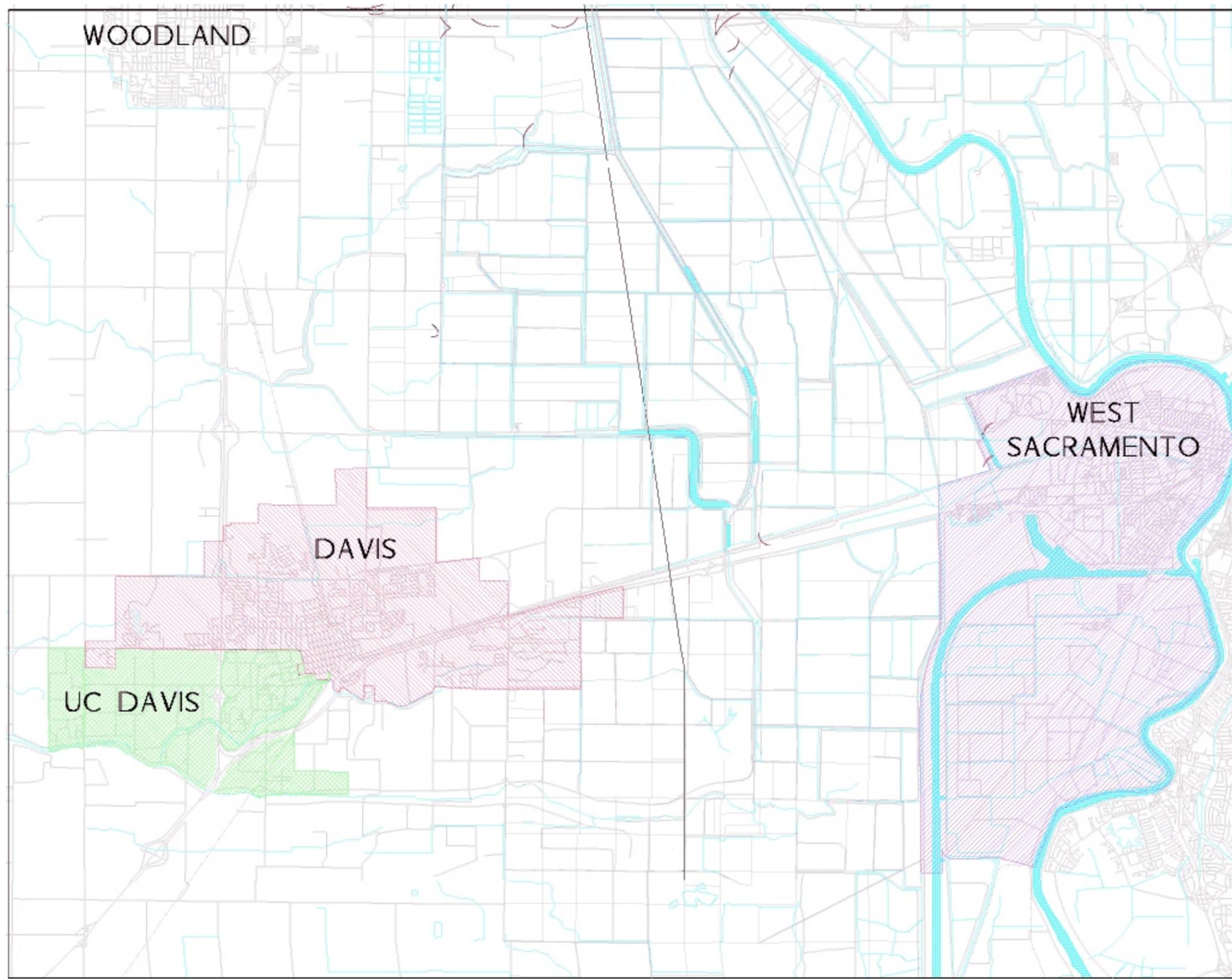
2.1 Description of Service Area

The City is located in the Central Valley to the east of the coastal mountain range and San Francisco Bay Area, and 12 miles west of the state capital of Sacramento in the southeastern corner of Yolo County. It occupies an area of about 9.8 square miles (6,281 acres). Incorporation of the City occurred in 1917, and water service is provided to all residential (single and multi-family), commercial, industrial, and irrigation customers, and for open space and fire protection uses.

Local development began in the 1860's around the California Pacific Railroad depot, in use today as a multimodal transportation hub. Agriculture, the City's initial primary industry, led to the location of the University of California (UC) at Davis. The State Agricultural Experiment Station at Davis was established by the UC in 1906 with degree programs to follow in the 1920's. The community soon became the economic center of the region.

The downtown core is the oldest portion of the City. Residential expansion was first to the north and west of the core. The City expanded south of I-80 and west of Highway 113 in the 1960's. Growth in the 1970's expanded the urban area in all directions, and additions in the last twenty years have built out major areas of the incorporated area and added land to the City service area. The City faces growth pressures from a variety of forces outside its control as follows: (1) steady growth of the UC Davis campus to meet growing state-wide education needs, (2) fast growing regional economy, particularly in both Solano and Sacramento counties, (3) proximity to the I-80 corridor, and (4) long term challenges for agriculture (international competition, high energy prices, and urban encroachment).

As shown on Figure 2-1, the City service area, bordered by UC Davis and West Sacramento, includes the City of Davis, El Macero (located south of Interstate 80), and additional areas to the north, south, east, and west of the City. The service area has a population of approximately 67,270.



SITE	Urban Water Management Plan City of Davis, California	
TITLE	Water Service Areas	
BROWN AND CALDWELL	PROJECT	128276-300
	DATE	11-2-05
	Figure	2-1

P:\28000\128276 - City of Davis UMM\graphics\FIGURES\resources

Source: West Yost and Associates Consulting Engineers, Davis/UC Davis Joint Water Supply Feasibility Study, September 2002

2.2 Local Climate

The City has a Central Valley climate. Summers are warm and dry, and winters are cool and mild. The region is subject to wide variations in annual precipitation, and also experiences periodic dry periods and wild fires in the regional watershed and surrounding areas in the native chaparral and oak lands. Summers can be hot at times with weekly periods of 100 degree Fahrenheit temperatures, greatly increasing summer irrigation requirements.

Based on the historical data obtained from the Western Regional Climate Center, the City's average monthly temperature ranges from 45 to 75 degrees Fahrenheit, but the extreme low and high daily temperatures have been 12 and 116 degrees Fahrenheit, respectively. The historical annual average precipitation is approximately 18 inches. The rainy season normally begins in November and ends in March. Average monthly precipitation during the winter months is about 10 inches, though records show that monthly precipitation has been as high as 38 inches. Evapotranspiration (ET_o) records, which measure the loss of water from the soil both by evaporation and by transpiration from the plants growing thereon, indicate average values ranging from 0.99 inches in the City's wet January to 8.5 inches in much drier August. Relative humidity in the region ranges from 21 percent to 95 percent. Low humidity usually occurs in the summer months, from May through September. The combination of hot and dry weather results in high water demands during the summer. Table 2-1 summarizes the City's average climate conditions.

Table 2-1. (DWR Table 3) Climate Characteristics

	Average temperature ^a , °F	Average rainfall ^a , in	Standard average ET _o ^b , in
January	44.99	3.51	0.99
February	49.66	3.34	1.73
March	53.48	2.34	3.37
April	58.26	1.19	5.47
May	64.78	0.46	6.89
June	71.2	0.15	8.12
July	74.68	0.01	8.49
August	73.45	0.03	7.48
September	70.54	0.23	5.79
October	63.2	0.88	4.24
November	52.75	2.05	2.04
December	45.63	3.15	1.16
Annual	60.2	17.35	4.65

^a Period of Record : 1/4/1917 to 3/31/2005 data recorded from Davis 1 WSW Station 042292, NOAA website www.wrcc.dri.edu

^b Data recorded July 1982 to August 2005 from Sacramento Valley, Davis Station 6, CIMIS www.cimis.water.ca.gov

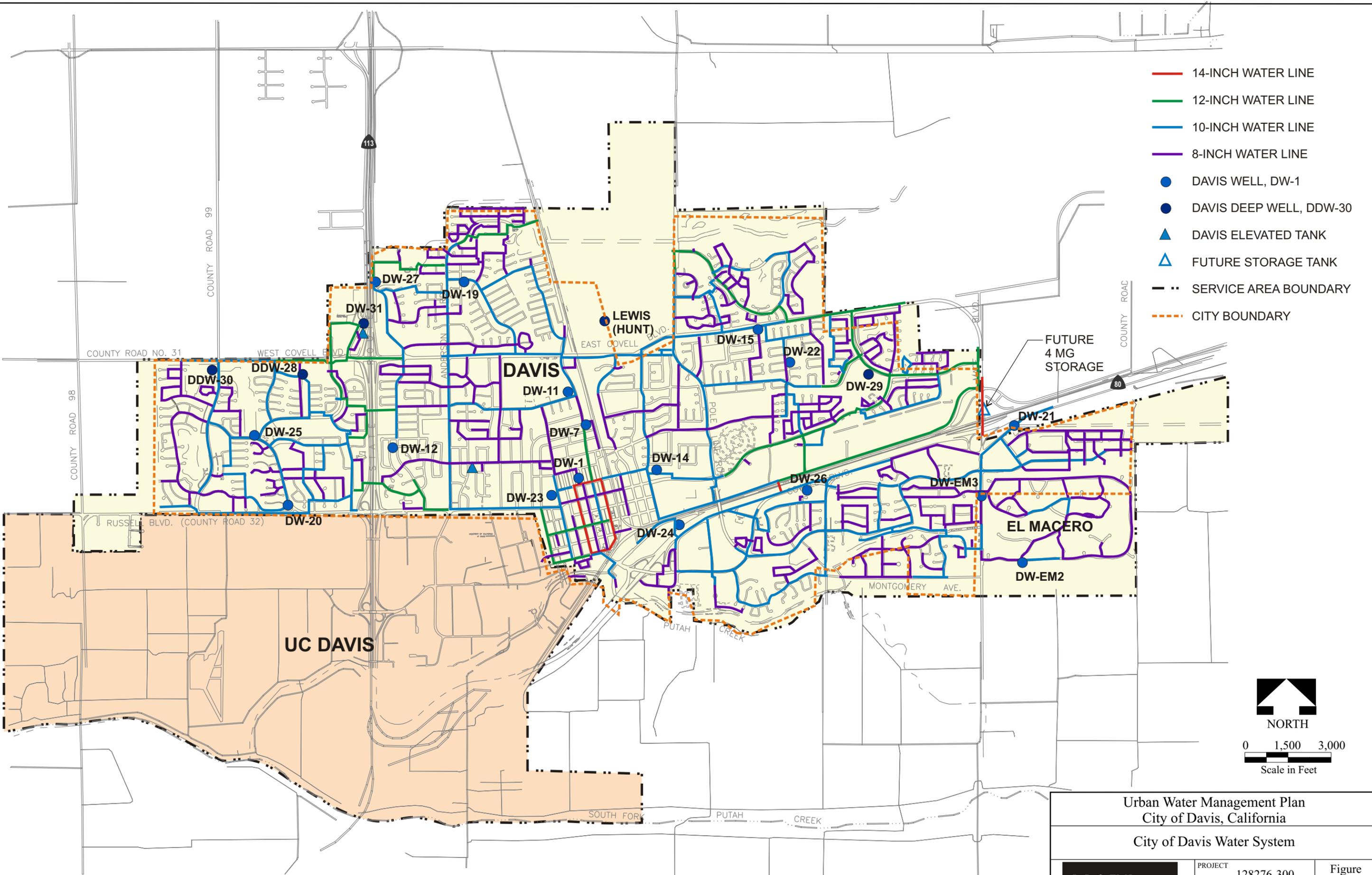
2.3 Water Supply Facilities

The City currently relies solely on groundwater to meet its entire potable water demand. Its water supply system consists of wells, distribution pipelines, and storage tanks, whose characteristics are summarized in the following sections. The City's water supply system is shown on Figure 2-2.

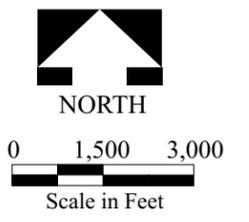
2.3.1 Groundwater Facilities

Water is currently supplied by 21 active wells located throughout the City as shown on Figure 2-2. Two aquifers, each with unique characteristics, supply the City and UC Davis with groundwater. Water-producing zones less than 700 feet deep are referred to as the intermediate depth aquifer. A slowly-permeable clay layer confines underlying water producing zones, which are referred to as the deep aquifer. All but five wells, tap into the intermediate aquifer system at a depth of approximately 300 to 600 feet. Due to more stringent water quality regulations and concerns, the City has been gradually shifting its groundwater pumping through its 21 wells from the intermediate to deep (below 700 foot depth) aquifers. Newer wells 28, 29, 30, and 31, are therefore completed in the deep aquifer to depths ranging from 1,400 to 1,800 feet (Winzler and Kelly, 2005). See Figure 2-3 for well depths, screen intervals, and pump settings. Tables 2-2, 2-3, and 2-4 summarize the capacity and status of the City's wells. The term "active" is used to refer to wells that are fully operational and used on a regular basis for water supply within the City. The term "inactive" is used to refer to wells that are not currently operational and cannot contribute to the City's supply without some type of additional maintenance, upgrade, or treatment prior to use.

P:\28000\128276 - City of Davis UMWMP\graphics\FIGURES\resources



- 14-INCH WATER LINE
- 12-INCH WATER LINE
- 10-INCH WATER LINE
- 8-INCH WATER LINE
- DAVIS WELL, DW-1
- DAVIS DEEP WELL, DDW-30
- ▲ DAVIS ELEVATED TANK
- △ FUTURE STORAGE TANK
- SERVICE AREA BOUNDARY
- CITY BOUNDARY



Urban Water Management Plan City of Davis, California		
City of Davis Water System		
BROWN AND CALDWELL	PROJECT	128276-300
	DATE	2-8-06
		Figure 2-2

Source: Brown and Caldwell, Phase II Deep Aquifer Study, 2005

Table 2-2. City of Davis Active Wells

Well no.	Well yield (GPM)
1	1,000
7	1,200
11	1,225
12	920
14	1,100
15	1,250
19	1,300
20	1,150
21	1,300
22	1,778
23	1,930
24	2,200
25	1,248
26	1,597
27	1,276
28	846
30	2,593
31	2,500
EM2	2,100
EM3	1,284
Total capacity	29,797

Table 2-3. City of Davis Recently Inactive Wells

Well no.	Well yield (GPM)	Well status notes
29	1,407	Inactive due to water quality concerns. Currently under investigation.
Lewis Property Well	715	Replaced in 2005 with a 80-2,000 GPM well expected to be online by Fall 2006
Total capacity	2,122	

Table 2-4. City of Davis Recently Destroyed Wells

Well no.	Year Destroyed	Well yield (GPM)
10	1988	875
13	2001	1,600
16	1998	1,045
17	1994	1,100
18	2002	850
EM-Vista	1988	800
Total capacity		6,270

The City's active wells range in age from new to 50 years old. Since 1987, the City has removed six intermediate wells from service due to age, poor water quality, production, and/or operation and maintenance problems. The City is currently proposing the addition of two new deep wells to

replace wells that have been taken offline. All active wells, as listed in Table 2-2, are available to supply water to the system. The City's average annual well production since the year 2000 is approximately 4,800 million gallons (MG). This value incorporates production years that utilized wells that are currently offline and years that didn't access several wells that have more recently come online. Of the current active wells, Well No. 14, powered by an internal combustion engine, is primarily used for emergency use such as the loss of electrical power. Furthermore, Well No. 31 is not available to meet peak demands due, respectively, to system capacity limitations, water quality problems and proximity to other wells. Currently, Well No. 12 and Well EM2 are likely candidates to be taken out of service due to their age and other problems associated with their use. And though Well No. 7 does not seem to exhibit the same water quality and system problems as Well No. 12 and Well EM2, with the well being over 52 years old, it is expected to need to be taken out of service soon (Winzler and Kelly, 2005).

2.3.2 Surface Water Facilities

The City does not currently use surface water. In October 1994, the Yolo County Flood Control and Water Conservation District (District) filed a water rights application for appropriation of surface water from the Sacramento River on the behalf of the City, UC Davis, and other entities in Yolo County. The City is pursuing a right to divert up to 20,000 acre feet per year (ac-ft/yr) of water from the Sacramento River, and is taking appropriate actions to keep future options open (West Yost, 2002).

2.3.3 Storage

The City currently has two storage facilities; a 200,000 gallon elevated storage tank near Elmwood Drive and Eight Street, and a 4 MG ground-based storage reservoir along John Jones Road in west Davis, adjacent to Sutter Davis Hospital. This west area water storage tank, as well as a new booster pump station, was built in 2002. An additional 4 MG tank is currently being planned near Mace Blvd. Storage reservoir locations are shown on Figure 2-2.

2.3.4 Treatment Facilities

The City's water does not pass through central treatment or distribution facilities but instead is filtered naturally by the sand and gravel in the intermediate and deep aquifers. The only treatment

administered is the addition of chlorine (sodium hypochlorite) at all wells for disinfection. If required, however, the City is prepared to design and implement more sophisticated well-head treatment at all existing and new wells.

2.4 Distribution System

The City distributes water to its customers through approximately 175 miles of 4 through 14-inch diameter pipelines. Distribution pipelines are shown on Figure 2-2. The hydraulic grade line in the system is primarily determined by the water level in the 200,000 gallon elevated storage tank at Eighth Street. Water levels in the elevated tank generally vary between 95 and 115 feet above ground level, maintaining system pressure between 40 and 50 pounds per square inch (psi) under most demand conditions. All facilities are monitored by a Supervisory Control and Data Acquisition (SCADA) system, which activates wells and booster pump facilities based on storage tank water levels or pressure at selected locations in the distribution system (Winzler and Kelly, 2005).

CHAPTER 3

HISTORICAL AND PROJECTED WATER USE

Water demand projections provide the basis for sizing and staging future water facilities. Water use and production records, combined with projections of population, employment, and urban development, provide the basis for estimating future water requirements. This chapter presents an analysis of available demographic and water use data, customer connections, unit water use, and the resulting projections for future water needs in varying water year types for the City.

3.1 Population, Employment, and Housing

The City's population has been increasing consistently since the 1960's. Population increases were above normal for the 1996-2000 period as strong regional economic forces and UC Davis campus growth exerted pressure on urban land development needs. Population has and is expected to continue to grow more gradually during the 2001-2010 period in accordance with the recently adopted update of the City's General Plan. Most of the City's growth has been in the residential and open space land uses, with a relatively small spurt of commercial development. However, the City is still primarily a residential service area and bedroom community to the Sacramento and the Bay Area. Significant increases in multifamily residential development occurred to meet increasing student population housing needs. In the commercial sector, there was some growth in high tech and tourist related businesses.

Since 2000, population, housing and employment have increased due in part to the booming California economy and strong regional real estate market. The University also increased annual enrollment targets, resulting in additional growth in the region. From 2000 to 2005, the population served by the City's water system increased by approximately 5,300, to a current population of 67,300.

Table 3-1 provides population projections for the City based on data provided by the State of California, Department of Finance.

Table 3-1. (DWR Table 2) Population – Current and Projected

Year	Population
2005	67,300
2010	71,300
2015	75,600
2020	80,200
2025	85,000
2030	90,100

Notes:

1. Source: DOF, E-4 Population Estimates for Cities, Counties and the State, 2001-2005, with 2000 DRU Benchmark, May 2005.
2. Population is based on DOF 2002 data.
3. Projections assume no growth for the communities of El Macero and Willowbank and 1.2% annual growth for the rest of the City population as provided in 2002 Water Supply Feasibility Study (West Yost, 2002).

3.2 Past, Current, and Future Water Use

This section discusses the City's water use by customer type and projected water demands by water year type.

3.2.1 Water Use By Customer Type

The past, current, and projected water demands for the City are identified in Table 3-2. The historical water demands in water year 2000 and 2004 were approximately 12,200 and 15,100 acre feet (ac-ft), respectively. The annual rate of increase from past water years 2000 through 2004 is approximately 5.4 percent. New water demands have increased along with population growth, however per capita water demands have leveled off at between 10-15 percent less than the historic average due to the completion of the meter retrofit project and conversion to metered rates for all customers.

The City of Davis Department of Public Works estimates that the City will grow at a 1.2 percent annual rate through 2030. This corresponds to a demand projection of 20,600 ac-ft for the year 2030. The historical and projected number of connections and water demands by customer sector are shown in Table 3-2. The 1.2 percent annual growth rate represents the desire of the City to grow at a slow rate versus the higher growth rates of the past.

Table 3-2. (DWR Table 12) Past, Current, and Projected Water Deliveries

Year			Water Use Sectors						Total
			Single family residential	Multi-family Residential	Commercial	Industrial	Institutional/government	Landscape	
2000 ^a	metered	# of accounts	13,544	507	612	0	234	235	15,132
		Deliveries ac-ft/yr	6,473	2,806	1,605	0	980	310	12,174
	unmetered	# of accounts	440	0	0	0	0	0	0
		Deliveries ^c ac-ft/yr	0	0	0	0	0	0	0
2005 ^b	metered	# of accounts	14,800	500	500	20	300	400	16,500
		Deliveries ac-ft/yr	7,200	3,000	1,700	0	3,100	400	15,300
2010 ^b	metered	# of accounts	15,700	500	600	20	300	400	17,500
		Deliveries ac-ft/yr	7,600	3,200	1,800	0	3,300	400	16,200
2015 ^b	metered	# of accounts	16,600	500	600	20	300	500	18,600
		Deliveries ac-ft/yr	8,100	3,300	1,900	0	3,500	400	17,200
2020 ^b	metered	# of accounts	17,700	600	700	30	300	500	19,700
		Deliveries ac-ft/yr	8,600	3,600	2,000	0	3,700	400	18,300
2025 ^b	metered	# of accounts	18,700	600	700	30	300	500	20,900
		Deliveries ac-ft/yr	9,100	3,800	2,200	0	3,900	400	19,400
2030 ^b	metered	# of accounts	19,900	600	700	30	400	600	22,200
		Deliveries ac-ft/yr	9,700	4,000	2,300	0	4,100	500	20,600

^a 2000 data is actual data from City of Davis DWR Public System Statistics Sheets.

^b Data is based on 1.2 percent service area growth per annum starting from a actual base 2004 year data set.

^c Year 2000 unmetered account deliveries are included in water loss estimates.

Residential Sector. The City of Davis single family residential customers average 3.1 persons per connection. Multi-family residential customers average 2.7 persons per housing unit, and average 20-25 units per multi-family complex (“General Plan”, 2001). In 2005, total system per capita water use was approximately 200 gallons per capita per day. This is less than the historic average of 230 and

greater than the City's long term goal of 185 gallons per capita per day. The current 93 percent relative allocation of residential accounts is projected to continue through the 2030 planning period.

Commercial Sector. The City continues to primarily be a residential community, with modest but growing commercial and industrial sectors. Business account growth in recent years has exceeded historic levels, although is still a very small part of the City's total water demands. The City has a mix of commercial customers, ranging from restaurants, markets, retail stores, insurance offices, beauty shops, gas stations, office buildings, some retail serving regional shoppers, and high-volume restaurants and other facilities providing services in support of local resident and University visitor populations. The City draws visitors from its close affiliation with UC Davis, proximity to the I-80 corridor, and annual special events drawing visitors from the entire region. In recent years, the sector has been growing faster than historic norms, driven particularly by the need for services by the increasing permanent population. Businesses for the growing tourist industry are also contributing. This trend is expected to continue through 2030.

Industrial Sector. The City has a very small industrial sector, primarily centered on technology and light manufacturing. The industrial sector has not grown relative to other sectors of use in the last decade. However, the City still expects a 1.2 percent growth rate as it intends to maintain zoning for minimum industrial land uses.

Institutional/Governmental Sector. The City has a stable institutional/governmental sector, consisting primarily of local government, schools, public facilities serving visitors, and hospitals. This sector will keep pace with the growth of the City.

Landscape/Irrigation Sector. Landscape accounts are meters serving only irrigation purposes. Irrigation accounts are expected to grow proportional to service area growth (1.2 percent per year for the next 20 years). Landscape/irrigation accounts represent water service for multi-family residential, commercial, industrial, institutional, and parks and open space sites. Evaluating City water rate policy, improving irrigation system efficiency, encouraging landscape conversions where appropriate, and adjusting irrigation schedules will generate water savings for this sector. Most of these accounts are billed for water usage and pay for service through a two-tier rate structure. This excluded City facilities, which are not billed.

3.2.2 Water Sales to Other Agencies

The City does not currently sell water to any other agency, and, as shown in Table 3-3, does not plan to sell water to any other agency.

Table 3-3. (DWR Table 13) Sales to Other Agencies

Water distributed	2000	2005	2010	2015	2020	2025	2030
Other agencies	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0

3.2.3 Unaccounted-for Water and Additional Water Use

Unaccounted-for water use is unmetered water use such as for fire protection and training, system and street flushing, sewer cleaning, construction, system leaks, and unauthorized connections.

Unaccounted-for water can also result from meter inaccuracies. The City assumes water losses between two and four percent of total water production. Table 3-4 shows additional water uses and losses.

Table 3-4. (DWR Table 14) Additional Water Uses and Losses, ac-ft/yr

Water Use	2000	2005	2010	2015	2020	2025	2030
Saline barriers	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Groundwater recharge	0	0	0	0	0	0	0
Conjunctive use	0	0	0	0	0	0	0
Raw water	0	0	0	0	0	0	0
Recycled water	0	0	0	0	0	0	0
Unaccounted-for system losses ^b	1,923 ^a	300 ^b	490 ^b	520 ^b	550 ^b	580 ^b	620 ^b
Total	1,923	300	490	520	550	580	620

^a Year 2000 water losses includes single-family unmetered account delivery.

^b Unaccounted-for water is assumed for this study to be approximately 3 percent of expected sales.

3.2.4 Total Water Use

The total past, present and future water use for the system is shown in Table 3-5 below. Historical and projected water demands as well as historically based trends are shown on Figure 3-1.

Table 3-5. (DWR Table 15) Total Water Use, ac-ft/yr

Water Use	2000	2005	2010	2015	2020	2025	2030
Total water demand ^a	14,097	15,600	16,700	17,700	18,800	20,000	21,200

^aTotal of Tables 3-2, 3-3, 3-4

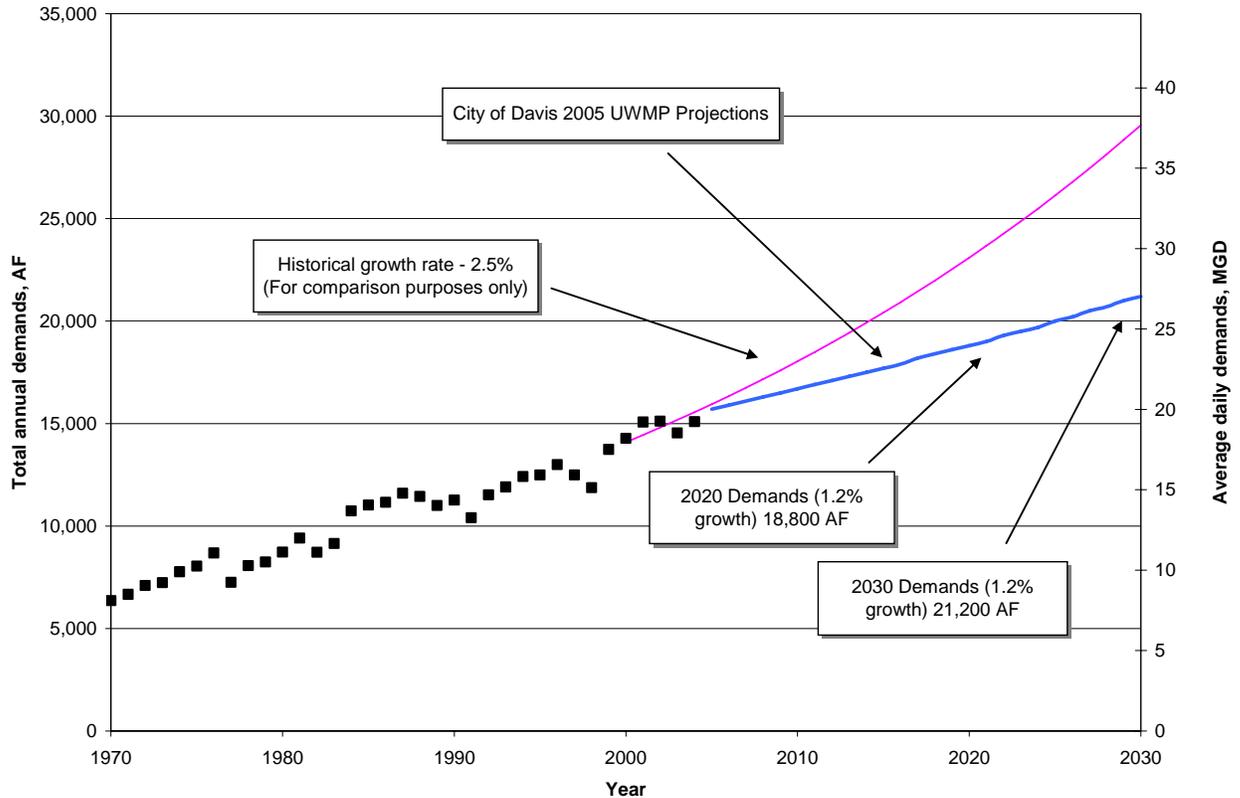


Figure 3-1. Past, Current, and Projected Water Demands

3.3 Demand on Wholesale Supply

Though the City has purchased an average of 170 ac-ft/yr per year since 2000 from the Lewis Investing Corporation’s (LIC) Hunt-Wesson existing deep well, the well is intended for limited usage only, not long-term, and is near the end of its useful life (Winzler and Kelly, 2005). LIC is currently working to develop a replacement deep well on the same Lewis property, and transfer of ownership to the City is an option the City may choose to exercise prior to the year 2010. Table 3-6 shows the City’s demand projections to wholesale suppliers as zero through 2030.

Table 3-6. (DWR Table 19) City Demand Projections to Wholesale Suppliers, ac-ft/yr

Wholesaler	2010	2015	2020	2025	2030
Lewis Investing Corporation (LIC)	0	0	0	0	0

3.4 Projected Water Demands by Water Year Type

This section presents the projected water demands for three water year scenarios: normal year, single dry year, and multiple dry years. The demands for all water year scenarios are projected through 2030.

3.4.1 Normal Year Demand

Normal-year water demands through the year 2030 are estimated based on a 1.2 percent growth estimate. The water demand projections are shown by water use sector in Tables 3-2 and 3-4 and summarized in Tables 3-5 previously. By 2030, water demands are expected to increase by 36 percent, from 15,600 ac-ft/yr in 2005 to 21,200 ac-ft/yr in 2030. Impacts to water use due to conservation measures that meet demand reduction goals are reflected in the projected water demands. The following Table 3-7 presents total projected water demand for the City.

Table 3-7. (DWR Table 41) Projected Normal Year Water Demand, ac-ft/yr

	2010	2015	2020	2025	2030
Total demand	16,700	17,700	18,800	20,000	21,200
Percent of year 2005	107	113	121	128	136

3.4.2 Single Dry Year Demand

The City assumes that overall demands will not change during a single dry year. Any demand reductions due to the implementation of the City’s water shortage contingency plan are not included in the single dry year demand estimates. Table 3-8 provides an estimate of the projected single-dry year water demands.

Table 3-8. (DWR Table 44) Projected Single Dry Year Water Demands, ac-ft/yr

	2005	2010	2015	2020	2025	2030
Total demand	15,600	16,700	17,700	18,800	20,000	21,200
Percent of projected normal ^a	100	100	100	100	100	100

Note: Water savings from future water conservation is not included in demand projections.

^aProjected normal from Table 3-7.

3.4.3 Multiple Dry Year Demand

This section projects the impact of a multiple dry year period for each 5-year period during the 25-year projection. As noted in Section 3.4.2, it is assumed that overall demands will not change during a single dry year, thus the first year demand of a multiple dry year drought is 100 percent of normal. Furthermore, it is assumed that overall demands will decrease 10 percent during a multiple dry year. Any demand reductions due to the implementation of the City's water shortage contingency plan are not included in the multiple dry year demand estimates. Tables 3-9 through 3-13 provide an estimate of the projected multiple-dry year water demands for each 5-year period.

Table 3-9. (DWR Table 47) Projected Multiple Dry Year Water Demands, ac-ft/yr, Period Ending in 2010

	2006	2007	2008	2009	2010
Total demand	15,900	14,500	14,700	14,900	15,000
Percent of projected normal ^a	100	90	90	90	90

Note: Water savings from future water conservation is not included in demand projections.

^aProjected normal from Table 3-7.

Table 3-10. (DWR Table 50) Projected Multiple Dry Year Water Demands, ac-ft/yr, Period Ending in 2015

	2011	2012	2013	2014	2015
Total demand	16,900	15,400	15,600	15,800	16,000
Percent of projected normal ^a	100	90	90	90	90

Note: Water savings from future water conservation is not included in demand projections.

^aProjected normal from Table 3-7.

Table 3-11. (DWR Table 53) Projected Multiple Dry Year Water Demands, ac-ft/yr, Period Ending in 2020

	2016	2017	2018	2019	2020
Total demand	17,900	16,300	16,500	16,700	16,900
Percent of projected normal ^a	100	90	90	90	90

Note: Water savings from future water conservation is not included in demand projections.

^aProjected normal from Table 3-7.

Table 3-12. (DWR Table 56) Projected Multiple Dry Year Water Demands, ac-ft/yr, Period Ending in 2025

	2021	2022	2023	2024	2025
Total demand	19,000	17,300	17,600	17,800	18,000
Percent of projected normal ^a	100	90	90	90	90

Note: Water savings from future water conservation is not included in demand projections.

^aProjected normal from Table 3-7.

Table 3-13. Projected Multiple Dry Year Water Demands, ac-ft/yr, Period Ending in 2030

	2026	2027	2028	2029	2030
Total demand	20,200	18,400	18,600	18,900	19,100
Percent of projected normal ^a	100	90	90	90	90

Note: Water savings from future water conservation is not included in demand projections.

^aProjected normal from Table 3-7.

CHAPTER 4

WATER SUPPLY

This chapter describes the City's current and planned water supply sources, quantities, constraints, and quality. In addition, this chapter describes current and projected water supplies, water supply reliability and vulnerability, and water transfers and exchanges. Recycled water supplies are discussed in Chapter 5 of this Plan.

4.1 Surface Water

The City currently utilizes no surface water, relying solely on local groundwater resources for its entire community water supply. However, the City has been investigating and pursuing supplemental surface water supplies to mitigate local groundwater quality concerns and create the possibility for conjunctive use management schemes that optimize treated groundwater as a base supply with groundwater from deep wells to meet peak demands. This would improve long-term water supply reliability, reduce the potential negative impact of future water shortage conditions, and reduce reliance on its groundwater source to avoid potential future negative impacts as a result of increased regional groundwater pumping. The City projects a surface water supply of 20,000 ac-ft/yr to become available by 2020, upon which all City intermediate aquifer wells will close and an estimated five to ten deep wells will remain online to act as an emergency back-up supply and maximum day and peak hour demand supply. The City's planned surface water supply projects are discussed in more detail in Sections 4.5 and 4.6 of this chapter.

4.2 Groundwater

The City currently only uses groundwater as its potable water supply source. This section provides a description of the City's groundwater supply as well as the physical and legal constraints of this supply.

4.2.1. Description

The City produces approximately 15,000 ac-ft/yr from 20 wells located throughout its service area (Figure 2-2). As detailed in Chapter 2 of this Plan, 16 wells are located in the intermediate aquifer (less than 700 feet), and four are in the deep aquifer at depths greater than 700 feet. Though the

majority of the groundwater pumping is still from the intermediate depth wells, since Fall 2001, an increasing amount (approximately 25 percent) of water has been produced from the deep aquifer with deep wells 30 and 31 coming online. The result of increasing the proportion of deep aquifer production has been improved overall system water quality. Improving groundwater quality also has improved customer acceptance for drinking water purposes and gives the City a better opportunity to comply with NPDES permit requirements. Water quality concerns are further discussed in Section 4.4 of this chapter.

The City pumps from the Sacramento Valley groundwater basin as shown in Table 4-1. The Sacramento Valley groundwater basin is not adjudicated, and there are no legal restrictions to groundwater pumping. The amount of groundwater pumped in the last five years is shown in Table 4-2.

Table 4-1. (DWR Table 5) Groundwater Pumping Rights

Basin name	Pumping right - ac-ft/yr
Sacramento Valley Groundwater Basin ^a	N/A

^aBasin is not adjudicated.

Table 4-2. (DWR Table 6) Amount of Groundwater Pumped, ac-ft/yr

Basin name	2000	2001	2002	2003	2004
Sacramento Valley Groundwater Basin ^a	12,174	13,053	15,111	14,548	15,098
Percent of Total Water Supply	100	100	100	100	100

^a Values from the City of Davis' submitted DWR Public Water System Statistics (PWSS) reports.

The amount of groundwater projected to be pumped in the next 25 years is shown in Table 4-3. The City is investigating alternative potable water supplies such as surface water and recycled water, and projects having a surface water supply source online by 2020 to meet all urban potable water demands. With their groundwater supply system designed to meet peak hour demands, until the surface water is available in 2020, the City projects pumping magnitudes to match total demand projections as shown in Table 3-3 in Chapter 3. Furthermore, once surface water does come online, the City plans to supplement this supply as needed to fully meet peak summer demands, with groundwater from the deep aquifer.

Table 4-3. (DWR Table 7) Amount of Groundwater Projected to be Pumped, ac-ft/yr

Basin name	2010	2015	2020 ^a	2025 ^a	2030 ^{a,b}
Sacramento Valley Groundwater Basin	16,700	17,700	0	0	1,200
Percent of Total Water Supply	100	100	0	0	6

^a Surface water supply online

^b Projected demands reflect 20,000 ac-ft surface water area-of origin supply available during October through May in normal years.

4.2.2. Physical Constraints

The City has few physical constraints on its groundwater supply other than the pumping capacities of existing wells. However, the Plainfield Ridge creates a minor restriction to east-west groundwater flow just west of the City. There are no other major restrictions to horizontal groundwater flow in the area (DWR “Bulletin 118”, 2004). The following description of the City’s groundwater basin offers potential physical considerations to the system.

The City’s deep aquifer zone appears to exist throughout the service area, and is more predominant to the north and west. The deep aquifer zone slopes downward from the Plainfield Ridge, 3.5 miles west of the service area, with gradual flattening towards the east.

The productive aquifers in the Davis area of Yolo County occur in Tehama and younger formations. In most areas of Yolo County, the sands and gravel of the Tehama Formation are thin, discontinuous layers between silt and clay deposits. In much of the eastern portion of the county, productive aquifers are found up to 700 feet below ground surface with few productive aquifers in the 700-foot to 1,000-foot depth range. In the study area (especially to the west), good quality water is also found in the Tehama Formation at depths of approximately 1,200 feet to 1,500 feet.

Aquifers in the Davis area are recharged by a number of sources. Deep percolation of rainfall and to a lesser extent irrigation water, are major components of groundwater recharge. Other significant sources include infiltration in streambeds, channels, and the Yolo Bypass. Relatively course-grained deposits line both Putah and Cache Creeks, allowing substantial infiltration.

Water moves very slowly between aquifers at different depths. In some places, water moves between aquifers through wells that have been screened at a number of different depths to enhance production. This causes the well columns to act as open pipes to equalize the water pressure of aquifers at different depths. The deep aquifer has a much longer recharge period as compared to the

intermediate depth aquifer, on the order of thousands of years versus hundreds of years, respectively. Both the City and UC Davis are increasingly reliant on the deep aquifer due to its superior quality to water produced from the intermediate depth aquifer. Furthermore, there are noticeable impacts on pumping from surrounding agricultural land use, though, no quantification is yet available.

4.2.3. Legal Constraints

There are currently no legal constraints on the City’s groundwater supply. The Sacramento Valley groundwater basin is not adjudicated, so no entity holds water rights to the deep aquifer. Under California water law, groundwater appropriation rights are not assigned unless ordered through legal adjudication proceedings. The water rights are generally based on correlative rights of the overlying users to put the water to reasonable beneficial use. The UC Davis deep wells have been in place for several decades. Although anticipated impacts are not expected to be sufficient cause for adjudication, should adjudication occur in the future, the prior usage by UC Davis could weigh into the adjudication order as one of many factors that would be considered and therefore limit either City or UC Davis withdrawals (Brown and Caldwell, 2004).

4.3. Desalination

The City currently has no opportunities or plans for using desalinated water as a supply source, as shown in Table 4-4.

Table 4-4. (DWR Table 18) Opportunities for Desalinated Water

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

4.4. Water Quality

This section describes the water quality of the existing water supply sources within the City and the manner in which water quality affects water management strategies. In addition, this section describes the manner in which water quality affects the water supply.

4.4.1. Water Quality of Existing Water Supply Sources

The quality of the existing groundwater supply sources and planned surface water supply sources over the next 25 years is expected to be adequate. In recent years a number of City intermediate-depth wells have been removed from service due to water quality problems, including high concentrations of total dissolved solids, nitrates, iron, manganese, and selenium. These problems have caused the City to drill additional wells into the deep aquifer. Groundwater will continue to be chlorinated, and treated as necessary to meet drinking water standards. Water quality deficiencies are expected to be a major challenge in the next 20 years as long as the City relies solely on untreated groundwater. In addition, wellhead treatment poses challenges associated with brine disposal and other issues.

Pumping from intermediate depth aquifers in Yolo County has caused about two feet of subsidence in the area of the City over the past 10 years. In addition, some City intermediate depth wells appear to have been damaged by subsidence or other subterranean movement based on well screen failures. This information is based on actual field observations (e.g. levee elevations) and validated by studies done by other agencies such as the United States Geological Survey (USGS). The Yolo County Subsidence Network was established in 1999 (a joint regional effort) to provide the opportunity for county agencies to periodically monitor and measure subsidence effects. Subsidence could cause a number of adverse impacts, including reduced water quality because water removed from the clay inter-layers during subsidence is typically poorer quality than water in the course-grained layers. This lower quality water would eventually reach the pumping wells.

One of the main reasons for constructing wells in the deep aquifer is to obtain water with higher overall quality versus the current quality of water from the intermediate depth aquifer. Water from the deep aquifer is much lower in hardness, selenium, and total salinity; however does not meet wastewater discharge requirements.

Additional water quality concerns include the concentration of some objectionable trace constituents in the deep aquifer, which is higher for wells in the far eastern portion of the service area. Parameters of greatest concern in the deep aquifer zone are hardness, arsenic, manganese, and temperature. Manganese levels in some deep strata exceed secondary drinking water standards. Arsenic levels averaging 4.6 parts per billion (ppb) are within current drinking water standards

(10 ppb in effect as of January 2006), but could be problematic if the limit is substantially reduced as may be promulgated by the California Environmental Protection Agency (Cal EPA) (Davis, 2004). Though wellhead treatment processes could be installed to remove arsenic and manganese or adjust temperature at the wellhead, it is very expensive, and would add capital and operating costs of intermediate or deep wells (West Yost, 2002).

There are no projected water supply changes due to water quality, as shown in Table 4-5. As discussed, the City will be bringing several additional deep wells online to replace poor-quality and otherwise vulnerable intermediate wells. Additionally, higher quality surface water will be available by 2020. These supply alternatives are discussed in detail in Section 4.6. Furthermore, the City has the potential for limited emergency well-head treatment.

Table 4-5. (DWR Table 39) Current and Projected Water Supply Changes Due to Water Quality

Water supply sources	2005	2010	2015	2020	2025	2030
Planned Surface Water	0	0	0	0	0	0
Supplier produced groundwater ^a	0	0	0	0	0	0
Recycled water ^b	0	0	0	0	0	0
Water supply loss due to water quality	0	0	0	0	0	0
Desalination water	0	0	0	0	0	0

^a No net groundwater supply change. Wells with groundwater quality issues will be replaced.

^b Recycled water is discussed in Chapter 5 of this Plan.

4.4.2. Water Quality Effects on Water Management Strategies

Water quality affects the City’s water management strategies through efforts to comply with Federal and State drinking water regulations. These regulations require rigorous water quality testing, source assessments, and treatment compliance.

In order to ensure that tap water is safe to drink, the United States Environmental Protection Agency (EPA) and the California Department of Health Services (DHS) prescribe regulations that limit the amount of certain contaminants in water provided by public water systems. The City is required to monitor drinking water quality on a daily, weekly, monthly, and annual basis. Water quality sampling results are compared against state and federal standards.

DHS has adopted a requirement for water agencies to perform a Drinking Water Source Assessment Program (DWSAP). The drinking water source assessment is the first step in the development of a

complete drinking water source protection program. The City of Davis has performed multiple DWSAPs in the last five years. The assessment includes the following:

1. A delineation of the area around a drinking water source through which contaminants might move and reach that drinking water supply;
2. An inventory of possible contaminating activities (PCA's) that might lead to the release of microbiological or chemical contaminants within the delineated area; and
3. A determination of the PCA's to which the drinking water source is most vulnerable.

Additional deep wells will be necessary to meet the water demands for the City and UC Davis, especially as intermediate wells are abandoned due to water quality problems (e.g. well 16 due to high nitrates) or physical failure. The deep aquifer has distinct characteristics from the intermediate depth aquifer zone, and the quality of water from the deep aquifer is greatly improved over that in the intermediate aquifer zone. Drinking water quality also impacts wastewater quality and affects the City's NPDES permit requirements regulating discharges to the environment.

As both the City and UC Davis increase groundwater pumping from the deep aquifer to avoid the water quality issues associated with intermediate aquifer pumping, there is the potential result of interagency interference effects which could cause new water supply challenges. Water level drawdown will be much greater with both agencies increasing their reliance on higher quality groundwater sources. While the deep aquifer produces water quality superior to that from intermediate wells, there are longer term concerns about interagency impacts and possible water quality shortcomings and a need to further understand the sustainability of the deep aquifer as a primary water source for both the City and UC Davis.

4.5. Current and Projected Normal Year Water Supplies

Table 4-6 summarizes the current and projected water supplies available to the City. This is based on a continued commitment to conservation programs and additional well development, in particular the deep aquifer, to improve system water quality. Additionally, as discussed earlier in this chapter, existing and projected demands are expected to be met with treated surface water supplies once available in 2020. Groundwater, available from the deep aquifer, will be available to

supplement surface water supplies during peak summer demands and when dry year cutbacks are made.

Table 4-6. (DWR Table 4) Projected Normal Year Water Supplies, ac-ft/yr

Water supply sources	2005	2010	2015	2020	2025	2030
Surface water ^a	0	0	0	18,800	20,000	20,000
Supplier produced groundwater ^b	15,600	16,700	17,700	0	0	1,200
Recycled water ^c	0	0	0	0	0	0
Water supply loss due to water quality	0	0	0	0	0	0
Transfers in or out	0	0	0	0	0	0
Exchanges in or out	0	0	0	0	0	0
Desalination water	0	0	0	0	0	0
Total	15,600	16,700	17,700	18,800	20,000	21,200

^a Once surface water supply is available in 2020, projected demands are expected to be fully met by surface water.

^b However, groundwater supply will be available to supplement surface water supplies to meet peak summer demands.

^c Recycled water is discussed in Chapter 5 of this Plan.

Though the City has accessed an approximately 170 ac-ft/yr water supply from the Lewis Investing Corporation's Hunt-Wesson existing deep well (Well LIC) since 2000, the well is intended for limited usage only, not long-term, and is near its the end of its useful life (Winzler and Kelly, 2005). LIC is currently working to develop a replacement deep well on the same Lewis property, and an option to transfer ownership to the City may be exercised prior to the year 2010. As summarized in Table 4-6, the City has no plans to purchase water from any wholesale supply source.

Table 4-7. (DWR Table 20) Wholesaler Identified & Quantified Existing and Planned Sources of Water- ac-ft/yr

Wholesaler sources	2010	2015	2020	2025	2030
LIC	0	0	0	0	0

4.6. Water Supply Projects

This section provides a description of the City's water supply projects and water supply programs that may or will be undertaken to meet the total projected water use and provide system reliability. There are projects currently in progress or planned for the near future, as described below. Plans to replace inconsistent sources and opportunities for exchanges of water are also presented.

As discussed in Section 4.1, the City is investigating and pursuing supplemental water supplies to mitigate local groundwater quality concerns and create the possibility for conjunctive use of both groundwater and surface water. This would improve long term water supply reliability, reduce the

potential negative impact of future water shortage conditions, and reduce reliance on the groundwater source to avoid potential future negative impacts as a result of increased regional groundwater pumping as well as subsidence and quality concerns for both drinking water and wastewater systems.

Supplemental high quality water supplies are being investigated and pursued through the 1994 water rights application filed in 1994 with the State Water Resources Control Board by the Yolo County Flood Control and Water Conservation District. The application provides the opportunity for the cities of Woodland and Davis, and UC Davis to secure high quality supplemental water supplies from the Sacramento River. The City, UC Davis, and Woodland are jointly pursuing the water rights application with a focus on identifying a specific project that could deliver treated, high water quality water that meets all water and wastewater quality regulation standards.

4.6.1. City Well Capacity Replacement Project

To replace the lost capacity of several recently removed wells (as discussed in Section 2.3.1 of this Plan), the Davis Well Capacity Replacement project consists of the installation of two or three deep aquifer wells (shown in Figure 4-1) with a combined maximum pumping capacity of 4,500 gallons per minute (gpm) and a water storage tank facility. The purpose of this well replacement project is to maintain an adequate water supply to meet current peak demands in the water system. The City's projected growth demands are expected to be met with treated surface water supply and peak demand deep wells by 2020 (Winzler and Kelly, 2005).



Figure 4-1. Typical Well Installation

4.6.2. City of Davis & UC Davis Joint Water Supply Source

Though still in its development phase with additional technical studies, environmental reviews and additional analysis necessary, the City projects surface water supplies by 2020. The City is pursuing

entitlements to divert water from the Sacramento River at three potential points of diversion north of West Sacramento. Once water rights are secured, a newly constructed regional water treatment plant would supply treated surface water to meet average day demands and approximately 75 percent of maximum day demands to the City. Groundwater would be pumped as needed to meet the remaining, primarily peak summer demands. To take advantage of existing groundwater pumping capacity, the remaining demands would be met with groundwater pumped from the deep aquifer wells. Peak hour demands and fire flow would be met from above ground storage reservoirs. Further details on this supply alternative can be found in the City of Davis and University of California, Davis Joint Water Supply Feasibility Study (West Yost, 2002).

Table 4-8 provides a summary and schedule of the future water supply projects. Also shown is a quantification of each project’s normal-year yield, single dry-year yield, and multiple dry-year yields. Surface water supply cutbacks are projected to be 10 percent in any single dry year and 20 percent in multiple dry years. Groundwater is expected to decrease five and ten percent in multiple-dry-years three and four, respectively.

Table 4-8. (DWR Table 17) Future Water Supply Projects

Project name	Projected start date	Projected completion date	Normal water year, ac-ft/yr	Single dry water year, ac-ft/yr	Multiple dry years, ac-ft/yr			
					Year 1	Year 2	Year 3	Year 4
City of Davis & UC Davis Joint Water Supply Feasibility Study Alternative 5 ^a	2015	2020	20,000	18,000	18,000	16,000	16,000	16,000
Davis Well Capacity Replacement Project ^b	Present	2010	7,300	7,300	7,300	7,300	6,900	6,600

^a Based on the availability of water rights water in the Sacramento River (West Yost, 2002).

^b Source: Winzler & Kelly Consulting Engineers. *Final Environmental Impact Report: Davis Well Capacity Replacement.*, July 2005.

4.7. Water Supply Reliability and Vulnerability

This section describes the reliability of the City’s water supply and their vulnerability to seasonal or climatic shortage. The costs of demand management or supply augmentation options to reduce the frequency and severity of shortages are increasing for the City. The City is looking more carefully at the costs of unreliability to make the best possible estimate of the net benefit of taking specific actions, hence the term “reliability planning.” Reliability is a measure of a water service system’s expected success in managing water shortages.

In addition to climate, other factors that can cause water supply shortages are earthquakes, chemical spills, and energy outages at treatment and pumping facilities. Planning must include the probability of catastrophic outages when using the reliability planning approach.

Reliability planning requires information about: (1) the expected frequency and severity of shortages; (2) how additional water management measures are likely to affect the frequency and severity of shortages; and (3) how available contingency measures can reduce the impact of shortages when they occur.

The City is currently facing a number of potential water supply challenges, including:

- Water quality concerns
- Concerns regarding the long-term reliability and sustainability of the deep aquifer
- Inability to replace old wells on small sites
- Difficulty of finding new well sites
- Inability to provide well-head treatment on small sites due to special constraints
- Inability to dispose of brine where wellhead treatment is possible
- Regional subsidence concerns

4.7.1. Reliability Comparison

The City's future supply projections assume the persistence of normal rainfall patterns, predictable annual groundwater recharge of the intermediate and deep aquifers, stable water quality characteristics based on past observations, and moderate promulgation of water quality regulations.

Reclamation project water, discussed further in Chapter 5, is a very reliable water source, because it is consistently available. The likeliest interruption would be as a result of loss of power or facility failure at the WWTP. Potable water would not be provided to reclamation users in the event non-potable water cannot be delivered. Four emergency generators are now available to maintain basic service from the well system. The City also recently constructed a new 4-million gallon water storage tank, completed in the fall of 2002 to provide additional emergency back-up, fire protection and peak demand capability to the water system.

In any one dry year, the City will need to carefully monitor its water supply. In the second consecutive dry year, the City may need to enter into a Stage 1 water shortage response, if demands exceed the per capita water use target level. In the third consecutive dry year, or in the event of a major system failure, the City may continue a Stage 1 water shortage response or move into a Stage 2 water shortage response. See the Water Shortage Contingency Plan in Appendix C and Chapter 7 for more detailed information.

A water supply reliability comparison is made in Table 4-9 for the year 2025, considering three water supply scenarios: normal (average) water year; single dry water year; and multiple dry water years. The City currently plans on diverting up to 18,000 ac-ft of surface water in “drier” years and 16,000 ac-ft during “multiple dry” years. The only other source of water for the City is groundwater, which is expected to decrease five and ten percent in multiple-dry-years three and four, respectively. Furthermore, though groundwater supplies in a third consecutive dry year are expected to decrease, it is assumed that once surface water supplies are available, groundwater production can fully supplement surface water supply to the extent needed to meet projected demands; this is due to minimal groundwater use during wet years and the fact that pumping will occur from the deep aquifer.

Table 4-9. (DWR Table 8) Water Supply Reliability, 2025, ac-ft/yr

Water supply sources	Normal water year	Single dry water year	Multiple dry water years			
			Year 1	Year 2	Year 3	Year 4
Surface Water ^a	20,000	18,000	18,000	16,000	16,000	16,000
Supplier produced groundwater ^b	0	2,000	2,000	4,000	4,000	4,000
Recycled water ^b	0	0	0	0	0	0
Water supply loss due to water quality	0	0	0	0	0	0
Desalination water	0	0	0	0	0	0
Total	20,000	20,000	20,000	20,000	20,000	20,000
Percent of normal year supply	100	100	100	100	100	100

^a Surface water cutbacks are projected to be 10% in any single dry year and 20% in multiple dry years.

^b With surface water supplies online and due to minimal use during wet years, groundwater production will offset surface water supply in peak periods to fully meet projected demands.

^c Recycled water is discussed in Chapter 5 of this Plan.

The definitions of these three water supply scenarios as stated in DWR’s Guidebook to Assist Water Suppliers in the Preparation of the 2005 Urban Water Management Plan are provided below.

1. Normal year is a year in the historical sequence that most closely represents median runoff levels and patterns. Normal is defined as the median runoff over the previous 30 years or more. This median is recalculated every ten years.
2. Single-dry year is generally considered to be the lowest annual runoff for a watershed since the water year beginning in 1903.
3. Multiple-dry year period is generally considered to be the lowest average runoff for a consecutive multiple year period (three years or more) for a watershed since 1903.

The basis of the water year data to develop the water supply reliability in Table 4-9 is provided in Table 4-10.

Table 4-10. (DWR Table 9) Basis of Water Year Data

Water year type	Base year(s)
Single-dry water year	1976-1977
Multiple-dry water years	1987-1992

4.7.2. Projected Single-Dry Year Water Supplies

The projected single-dry year water supplies are provided in Table 4-11.

Table 4-11. (DWR Table 43) Projected Single-Dry Year Water Supplies, ac-ft/yr

Water supply sources	2005	2010	2015	2020	2025	2030
Total supply	15,600	16,700	17,700	18,800	20,000	21,200
Percent of normal year supply	100	100	100	100	100	100

4.7.3. Projected Multiple-Dry Year Water Supplies

This section projects the impact of a multiple dry year period for each 5-year period during the 25-year projection. Tables 4-12 through 4-16 provide an estimate of the projected multiple-dry year water supplies for each 5-year period.

Table 4-12. (DWR Table 46) Projected Multiple Dry Year Water Supply, ac-ft/yr, Period Ending in 2010

Water supply sources	2006	2007	2008	2009	2010
Total supply	15,900	14,500	14,700	14,900	15,000
Percent of normal year supply	100	90	90	90	90

Table 4-13. (DWR Table 49) Projected Multiple Dry Year Water Supply, ac-ft/yr, Period Ending in 2015

	2011	2012	2013	2014	2015
Total supply	16,900	15,400	15,600	15,800	16,000
Percent of normal year supply	100	90	90	90	90

Table 4-14. (DWR Table 52) Projected Multiple Dry Year Water Supply, ac-ft/yr, Period Ending in 2020

	2016	2017	2018	2019	2020
Total supply	17,900	16,300	16,500	16,700	16,900
Percent of normal year supply	100	90	90	90	90

Table 4-15. (DWR Table 55) Projected Multiple Dry Year Water Supply, ac-ft/yr, Period Ending in 2025

	2021	2022	2023	2024	2025
Total supply	19,000	17,300	17,600	17,800	18,000
Percent of normal year supply	100	90	90	90	90

Table 4-16. Projected Multiple Dry Year Water Supply, ac-ft/yr, Period Ending in 2030

	2026	2027	2028	2029	2030
Total supply	20,200	18,400	18,600	18,900	19,100
Percent of normal year supply	100	90	90	90	90

4.7.4 Factors Resulting in Inconsistency of Supply

A summary of the factors resulting in inconsistency of the surface water and groundwater supply sources is provided in Table 4-17.

Table 4-17. (DWR Table 10) Factors Resulting in Inconsistency of Supply

Water supply sources	Legal	Environmental	Water quality	Climatic
Projected surface water supply	X	X		X
Supplier produced groundwater			X	

Currently, the City has an adequate groundwater supply to provide water supply during single-dry and multiple-dry water years. Water demand management measures would not be solely depended upon to replace inconsistent sources. The water shortage contingency plan would be implemented when there is a need to reduce demands significantly on a short-term basis. Chapter 6 of this Plan

describes the City’s current demand management measures. The water shortage contingency plan is presented in Appendix C and discussed in Chapter 7.

The City does not project wholesale water, as shown in Table 4-18.

Table 4-18. (DWR Table 22) Factors Resulting in Inconsistency of Wholesaler’s Supply

Name of supply	Legal	Environment	Water Quality	Climatic
N/A	None	None	None	None

4.8. Transfer and Exchange Opportunities

The City is not actively pursuing dry year water transfer options with urban or agricultural districts locally or statewide. It is estimated that the City could reduce water demands by 10 percent or about 1,550 acre-feet on a short term basis from the 2005 baseline year demands to mitigate the three-year multiple dry year scenario. However if a prolonged dry period extended beyond a three-year period, the City could potentially experience difficulty in getting full water production from all of its wells. Under this scenario, the City would consider temporary emergency water transfers with farmers adjacent to the City service area if water was available and met drinking water standards. Farmers would have to fallow fields under this scenario in order to make water available for transfer. This has economic consequences on individual growers, the County, and the region. Any consideration of this nature would be evaluated through an interagency process.

Water transfer guidelines were developed in Yolo County in the early 1990s through the Water Resources Association of Yolo County. The goal of this policy was to discourage out-of-county water transfers without due process and to ensure environmental review, including mitigation of potentially significant impacts. The other facet of this policy was to allow flexibility for intra-county transfers which could be particularly beneficial to water users in Yolo County during a severe water shortage condition.

This policy will be revisited during the next five-year period as state-wide water management objectives unfold, and Yolo County interests update local water management plans and policies. The major impediment to water transfers within the county (resulting in the transfer of agricultural to urban water supplies) would be water quality. Most of the agricultural wells in the county are from the shallow and intermediate depth aquifers which would provide marginal quality for urban users seeking sources that meet safe drinking water and wastewater discharge requirements.

With regards to water transfers, the City will continue to support such a policy and work with other agencies to facilitate intra-county transfers while making sure due process occurs in regard to any out-of-county water transfers. A summary of the City's water supply transfer and exchange opportunities is provided in Table 4-19.

Table 4-19. (DWR Table 11) Transfer and Exchange Opportunities, ac-ft/yr

Transfer agency	Transfer or exchange	Short term proposed quantities, ac-ft	Long term proposed quantities, ac-ft
N/A	N/A	N/A	N/A

CHAPTER 5 RECYCLED WATER

The purpose of this chapter is to provide information on recycled wastewater and its potential for use as a water resource in the City. The elements of the chapter are: (1) The quantity, quality and existing use of wastewater generated in the service area. (2) A description of the collection, treatment, and disposal/reuse of that wastewater. (3) The current plans for water recycling. (4) The potential for water recycling in the service area. (5) The plan for promoting and optimizing the use of recycled water.

5.1 Agency Coordination

The City of Davis Department of Public Works in addition to being responsible for urban water supply, manages the wastewater collection and treatment for the domestic and industrial wastewater flows generated within the City. Table 5-1 summarizes the agency coordination involved in developing this reuse summary.

Table 5-1. (DWR Table 32) Agency Participation in Reuse Planning

Agency Type	Participating Agency	Role
Local Water Supplier	City of Davis Department of Public Works	Provided Extensive Information
Wastewater Provider	City of Davis Department of Public Works	Provided Extensive Information

5.2 Wastewater Quantity, Quality, and Existing Uses

The following section describes the estimated wastewater generated in the City's service area. All collected flows are treated at the City-owned Water Pollution Control Plant (WPCP). An upgrade to the WPCP is currently being planned with potential reuse opportunities considered. This section provides a description of the plant treatment process and disposal method.

5.2.1 Wastewater Generation

Municipal wastewater in the City is generated from a combination of residential and commercial sources. The quantities of wastewater generated are proportional to the population and the water use in the service area. Estimates of the wastewater flows generated within the City for the present and future conditions are presented in Table 5-2. The source of the estimates is the population

projection in Chapter 3 applied to historical WWTP inflow. The projected effluent that will meet urban reuse water quality is also listed in Table 5-2 and is based on the current status of the City of Davis Wastewater Treatment Plant Master Plan Upgrade (Smith, 2005).

Table 5-2. (DWR Table 33) Wastewater Collected and Treated, ac-ft/yr

	2000	2005	2010	2015	2020	2025	2030
Wastewater collected in service area ^a	6,337	6,813	7,234	7,682	8,157	8,661	9,196
Quantity that meets recycled water standard	0	0	0	0	0	0	0

^a Projections based on 1.2 % population growth rate presented in Chapter 3 of this report and actual WWTP inflow as provided by Keith Smith, City of Davis. Data does not reflect any new or planned water conservation measures.

5.2.2 Wastewater Collection

The wastewater collection system in the City is a network of pipes, and lift stations that transport wastewater from its source to the treatment plant. Due to additions from inflow and infiltration the collected wastewater volume is greater than the wastewater volume generated by customers shown in Table 5-2. Inflow and infiltration, includes water that enters the sewer system through breaks, gaps, and joints during rain, flood, and high water table conditions. In the City, the inflow and infiltration quantities are estimated to be significant. These quantities are not accounted for in the water recycling projections of this report because they primarily occur during the winter rainy season when water recycling is not critical.

5.2.3 Wastewater Treatment

The City of Davis WPCP uses a combination of both conventional and natural treatment processes to effectively meet discharge standards. The WPCP is rated at an operating capacity of 7.5 million gallons per day (mgd), with current flows at approximately 5.8 mgd. The operations and maintenance manual recommends separate treatment trains for Spring/Summer (April through October) and Fall/Winter (November through March) operation. Current wastewater treatment at the WPCP includes the following processes:

1. Primary Sedimentation
2. Oxidation Ponds
3. Overland Flow System

4. Aerated Ponds
5. Lemna (Duckweed) Settling Pond
6. Chlorination/Dechlorination
7. Restoration Wetlands
8. Wastewater Disposal
9. Anaerobic Sludge Digestion and Drying Lagoons

Most of the current facilities at the WPCP were constructed in 1972. These facilities include a headworks, aerated grit chamber, two primary clarifiers, three oxidation ponds (120 acres total) with recirculation, gas chlorine disinfection facilities, one anaerobic digester and sludge drying lagoons. The design capacity of the original plant facilities was 5.0 mgd, but the headworks was sized large enough to allow conversion to a regional treatment plant at a later date.

In 1980, overland flow treatment facilities were constructed to provide additional suspended solids removal for oxidation pond effluent. In early 1993, the overland flow slopes were taken out of service for complete renovation in accordance with an EPA compliance order. Slopes were re-leveled, the soil was conditioned with gypsum, collection ditches were lined with cobbles, and new grass was planted. The renovated overland flow facilities started operation in the spring of 1995.

In 1988, new chlorine disinfection facilities were constructed with a capacity of 7.5 mgd, and new overland flow influent and effluent pumps were installed with a capacity of 6.3 mgd. A new transfer structure was also constructed to allow primary effluent to be blended with oxidation pond effluent. In 1999, several improvements were made to achieve the performance needed to meet the discharge standards for an estimated capacity of 7.5 mgd, while continuing to meet the operational and reliability goals established for the plant. These improvements included:

1. Modifications to the influent pumping and preliminary treatment facilities;
2. Expansion of the primary treatment facilities;
3. Several modifications to the natural secondary wastewater treatment system, including the addition of new mechanically aerated ponds and a lemna clarification pond;
4. Changes in operational procedures for the secondary facilities in the late spring through early fall;

5. Modification to the disinfection facilities; and
6. Expansion of the solids treatment facilities.

5.2.4 Wastewater Disposal

All effluent is either taken up by the consumptive use of 180 acres of restoration wetlands, or discharged to Willow Slough Bypass, as shown in Table 5-3. The amount of treated effluent discharged to and taken from the restoration wetlands is not metered, however, effluent is recycled to supply the consumptive uses of the wildlife habitat area. The wetlands were intended to be operated by allowing effluent from the WPCP to flow through the ponds prior to discharge. Excessive retention time within the wetland ponds, however, has resulted in an elevated pH in the wetland effluent. As a result, this effluent must be blended with WPCP effluent at a ratio of 1:4 before it can be discharged. This further extends the retention time within the ponds, exacerbating the pH issue within the ponds. The City is examining the feasibility of providing a temporary pH control facility on the wetlands effluent to allow for a complete flushing of the wetland ponds to help reduce the impact of this temporary condition.

Table 5-3. (DWR Table 34) Disposal of (non-recycled) Wastewater, ac-ft/yr

Method of disposal	Treatment level	2005	2010	2015	2020	2025	2030
Willow Slough Bypass ^a	Secondary/	5,167	5,014	--	--	--	--
	Tertiary (by 2015)	--	--	5,462	5,937	6,441	6,976

^a Value is the difference between total collection and recycled water use. Does not account for inflow and infiltration magnitudes.

5.3 Water Recycling Current Uses

Currently, the City does not use recycled water to mitigate urban demand. This section presents current reuse in the regional area. The City uses a portion of its secondary treated effluent as the primary source of water for an approximately 180 acres of a 398-acre, City-owned acre reclamation wetland facility. The City is also currently investigating the potential to expand its recycled water program to include irrigation on agricultural properties, application to a nearby wildlife habitat wetlands project, or possibly a combination of both alternatives.

Because the influent to the wetlands is not metered, an exact calculation of consumptive use the wetlands cannot be determined. An annual average consumptive use of 1.0 mgd was estimated, based on local evapotranspiration (ET) and rainfall data, and a probable percolation rate for the

ponds. This consumptive use value is largely dependent on ET, and in the summer months, would be much higher than the average, while in the winter months, it is likely to be near zero.

The actual uses of recycled water in 2005 are listed in Table 5-4 shown.

Table 5-4. (DWR Table 35A) Existing Recycled Water Uses

Type of use	Treatment level	2005 ac-ft
Agriculture	--	0
Landscape	--	0
Wildlife habitat	--	0
Wetlands	Secondary effluent	1,170 ^a
Industrial	--	0
Groundwater recharge	--	0
Total	--	1,170

^aBased on water balance from the October 1995 West Yost and Associates Facilities Plan for Improvement and Expansion of the City of Davis Water Pollution Control Plant, updated for current wastewater wetlands tract size of 180 acres.

5.4 Potential and Projected Recycled Water Use Plan

No specific treatment is required for the use of effluent in wetlands for wildlife habitat. However, standard secondary wastewater treatment is recommended to minimize the potential for odors and vectors. For wetlands with active use by the public, at least “disinfected secondary 2.2” recycled water would be required to meet California Title 22 Water Recycling Criteria for non-contact recreational impoundments. Wastewater treated to “disinfected Secondary 2.2” means that water has been oxidized and disinfected so that the median concentration of total coliform bacteria in the disinfected effluent does not exceed a most probable number (MPN) of 2.2 organisms per 100 milliliters utilizing the bacteriological results of the last seven days for which analyses have been completed, and the number of total coliform bacteria does not exceed an MPN of 23 per 100 milliliters in more than one sample in any 30-day period. It is likely that improvements to the existing WPCP facilities, and operational and maintenance changes, will be needed to meet these water quality goals. There are, however, many potential uses for all the “Secondary 2.2” water that will be produced.

Requirements for wastewater treatment prior to agricultural reuse is also governed by the Title 22 Water Recycling Criteria. “Disinfected secondary 2.2” recycled water would be suitable for almost all the crops grown in the area near the wastewater treatment plant. Water used to irrigate crops grown

for direct human consumption would need to be treated to “disinfected tertiary 2.2” recycled water standards.

The City has hired a consultant to analyze current treatment processes at the WPCP, recommend the best operation and maintenance practices, and analyze the economics and water quality requirements of potential recycled water projects. Preliminary analyses have shown that 100 percent reuse is an economically justifiable and environmentally beneficial solution for long term disposal. Although the proposed recycled water project is still in its planning stage; recycled water could potentially be used to offset surface water needs for both agricultural irrigation and the wildlife habitat wetlands project.

Preliminary investigations have evaluated the potential for expansion of the City’s recycled water program to properties surrounding the WPCP. The Conaway Ranch (Reclamation District 2035) located to the north of the WPCP is a 17,000 acre privately-owned farm. When the Davis restoration wetland was constructed, the City also planned to eventually pursue reclamation on Conaway Ranch, and facilities were included in the design to allow for the delivery of treated effluent to the property. In addition to re-examining the potential for reclamation on Conaway Ranch, the preliminary investigations also identified the 1,800 acre Swanston Ranch Easement Wetlands Project as a potential year-round recycled water reuse option.

Based on these investigations, both alternatives appear economically feasible. The technical feasibility of the alternatives are currently being evaluated, and following negotiations with the landowners, regulators, and all other interested parties, the City will make a decision concerning the future uses of recycled water in the area.

5.4.1 Potential Recycled Water Quantity and Use

The City is in the process of developing a program to reuse 100 percent of its effluent from the WPCP. Currently, dry weather treatment plant flows are approximately 5.8 mgd, and are expected to increase to the plant’s 7.5 mgd capacity over the next 15 years. Until a final decision concerning the future of reclamation has been made, however, quantification of the types of recycled water use cannot be made (Smith, 2005).

A major factor to determine which *potential* recycled water project becomes a *projected* construction project is the financial feasibility of connecting the user to the system. A recycled water distribution system will require pipelines, storage tanks, and pumps. This infrastructure is complex and costly to construct. In addition, the recycled water user must make their own investment in constructing and operating the on-site irrigation pipelines and sprinkler systems together with the necessary warning signs, backflow prevention, and associated health and safety requirements.

The volume of potential recycled water use is shown in Table 5-5. This table estimates the use of recycled water for various uses at five-year intervals.

Table 5-5. (DWR Table 35B) Recycled Water Uses – Potential ac-ft/yr

Type of use	Treatment level	2010	2015	2020	2025	2030
Agriculture	Secondary	1,050	--	--	--	--
	Tertiary	--	1,050	1,050	1,050	1,050
Landscape ^a	Tertiary	0	300	300	300	300
Wildlife Habitat		0	0	0	0	0
Wetlands	Secondary	1,070	1,070	1,070	1,070	1,070
Industrial		0	0	0	0	0
Groundwater recharge		0	0	0	0	0
Total		2,120	2,420	2,420	2,420	2,420

^aNot considered economically viable, but potential use at Wild Horse golf course

5.4.2 Projected Recycled Water Use Plan

The City's 2000 Urban Water Management Plan made future projections for recycled water use. A comparison of this projection with the actual use in 2005 is shown in Table 5-6.

Table 5-6. (DWR Table 37) Recycled Water Uses – 2005 Projection versus Actual, ac-ft/yr

Method of disposal	2000 projection for 2005	2005 actual use
Agriculture	0	0
Landscape	0	0
Wildlife habitat	0	0
Wetlands	1,486	1,170 ^a
Industrial	0	0
Groundwater recharge	0	0
Total	1,486	1,170

^aBased on water balance from the October 1995 West Yost and Associates Facilities Plan for Improvement and Expansion of the City of Davis Water Pollution Control Plant, updated for current wastewater wetlands tract size of 180 acres.

Currently, the City is using an estimated 1,170 ac-ft/yr of recycled water in its 180-acre restoration wetlands. By 2015, the City is expected to deliver 1,050 ac-ft to agricultural reclamation, and depending on future negotiations with landowners this value could be higher. The current and future use projections match the 1.2 percent growth projections presented in Chapter 3 of this UWMP. The projected future use of recycled water in the City’s service area for the next 25 years is shown below in Table 5-7.

Table 5-7. (DWR Table 36) Projected Future Use of Recycled Water in Service Area, ac-ft/yr

Type of use	2010	2015	2020	2025	2030
Agriculture	1,050	1,050	1,050	1,050	1,050
Landscape	0	0	0	0	0
Wildlife habitat	0	0	0	0	0
Wetlands	1,170	1,170	1,170	1,170	1,170
Industrial	0	0	0	0	0
Groundwater recharge	0	0	0	0	0
Total	2,220	2,220	2,220	2,220	2,220

5.5 Optimizing the Use of Reclaimed Water

This section discusses how the City promotes the use of recycled water and their optimization plan for recycled water use.

5.5.1 Promotion of Recycled Water Use

The City will provide recycled water free of charge to the preferred reclamation project alternatives: Conaway Ranch, Swanston Ranch, or other agricultural users as discussed previously in Section 5.4. In return, the City will require a long term use agreement to assure that all recycled water produced in the future will be used by the chosen project. For the agricultural reuse alternatives being considered, treated surface water is the City’s assumed primary water supply source, so that if recycled water was made available, some of this surface water supply will be available for other purposes. Methods to encourage recycled water use are listed in Table 5-8.

Table 5-8. (DWR Table 38) Methods to Encourage Recycled Water Uses

Actions	ac-ft/yr of use projected to result from this action				
	2010	2015	2020	2025	2030
Financial incentives ^a	TBD	TBD	TBD	TBD	TBD
Education	0	0	0	0	0
Other	0	0	0	0	0
Total	TBD	TBD	TBD	TBD	TBD

^a TBD, to be determined. This matter is currently under investigation by the City.

5.5.2. Optimization Plan for Recycled Water

To optimize the use of recycled water, cost/benefit analyses must be conducted for each project alternative. These alternatives will then be ranked from highest to lowest net benefit so that the most balanced option can be implemented. Once the preferred alternative has been chosen, the City will work closely with the landowner(s) to assure recycled water use is optimized so that all delivered water can be used.

Both economic and financial analyses will be conducted for each potential recycled water use alternative. Data are common to both analyses; however, they are used for different purposes. An economic analysis considers all monetary costs and benefits to society, regardless of who pays the costs or receives the benefits. A financial analysis demonstrates financial feasibility of a project by evaluating who could pay or share the costs, and who receives or shares the benefits. Economic and financial feasibility do not always exist together for the same project -- for instance, a project may be economically feasible from the broad regional or statewide perspective, yet financially infeasible from the local perspective.

Environmental impacts also have economic costs and benefits. The impacts should be identified and included in an environmental mitigation plan. Even though monetary estimates of environmental benefits and costs are difficult to make, these should be included, especially in cases where environmental enhancement and/or recreational opportunities play a major role in the justification of the project.

The acceptance of recycled water and the decision by customers to use recycled water instead of potable water depends on its cost, quality, reliability, and benefits. The issue of cost is a significant hurdle. Currently the capital cost to produce and deliver tertiary treated recycled wastewater is higher than the cost to treat and deliver potable water. This is because it is costly to treat wastewater

to strict tertiary standards. In addition there is a large capital cost to build a recycled water distribution piping system. The customer's expectation is to pay significantly less money for recycled water than for potable water as an incentive to build and maintain non-potable water piping as well as providing an incentive for taking on the risk perceived with using recycled water.

In addition to cost, the quality and reliability of recycled water is also critical to the adoption of recycled water. The recycled water should be odorless and colorless. It can not lead to algae growth that will clog irrigation nozzles and fittings. The water must not be corrosive or have a pH imbalance that would be a stressor to vegetation. It must not have a mineral content that will stain equipment or surfaces. The reliability of the recycled water supply is important to promote its dependability as a product. The construction of recycled water storage facilities are critical to ensuring there is an adequate supply under high demand conditions. These same facilities are necessary to maintain a consistent service water pressure. Elevated water tanks and reservoirs would be necessary for the promotion of recycled water as an alternative to potable water.

CHAPTER 6

WATER CONSERVATION BEST MANAGEMENT PRACTICES

Water conservation is an available method to reduce water demands, thereby reducing water supply needs for the City. The unpredictable water supply and ever increasing demand on California's complex water resources have resulted in a coordinated effort by the DWR, water utilities, environmental organizations, and other interested groups to develop a list of urban Best Management Practices (BMPs) for conserving water. This consensus-building effort resulted in a Memorandum of Understanding Regarding Urban Water Conservation in California (MOU), which formalizes an agreement to implement these BMPs and makes a cooperative effort to reduce the consumption of California's water resources. The MOU is administered by the California Urban Water Conservation Council (CUWCC). The MOU requires that a water utility implement only the BMPs that are economically feasible. If a BMP is not economically feasible, the utility may request an economic exemption for that BMP.

The City, a signatory to the California Urban Water Conservation Council's Memorandum of Understanding since August 1994, has submitted their demand management implementation progress to the BMP Reporting Database. BMP Activity Reports and Coverage reports for reporting years 2003-2004 are included in Appendix D. As shown in Table 6-1, the City implements all BMPs except for BMPs 2 and 14. Exemption details, including a cost-benefit analysis, for those BMPs that the City does not implement, are included in Appendix E. Program summaries of the City's planned conservation activity are included in Appendix F.

Table 6-1. City of Davis Water Conservation Best Management Practices Status

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

CHAPTER 7

WATER SUPPLY

This chapter provides a comparison of projected water supplies to demands and identifies any water shortage expectations. The City’s water shortage contingency actions are also presented.

7.1 Current and Projected Water Supplies versus Demand

This section provides a comparison of normal, single dry, and multiple dry water year supply and demand for the City. Water demands are addressed in Chapter 3, water supply is addressed in Chapter 4, and recycled water supply is addressed in Chapter 5 of this Plan.

7.1.2 Current and Projected Normal Year Water Supplies versus Demand

The normal water year current and projected water supplies are compared to the current and projected demand for the City in Table 7-1.

Table 7-1. (DWR Table 42) Normal Year Water Supply and Demand Comparison, ac-ft/yr

	2005	2010	2015	2020	2025	2030
Supply totals	15,600	16,700	17,700	18,800	20,000	21,200
Demand totals	15,600	16,700	17,700	18,800	20,000	21,200
Difference (supply minus demand)	0	0	0	0	0	0
Difference as a percent of supply	0	0	0	0	0	0
Difference as a percent of demand	0	0	0	0	0	0

7.1.3 Current and Projected Single-Dry Year Water Supplies Versus Demand

The current and projected water supplies are compared to the demands for a single dry year for the City in Table 7-2.

Table 7-2. (DWR Table 45) Single-Dry Year Water Supply and Demand Comparison, ac-ft/yr

	2005	2010	2015	2020	2025	2030
Supply totals	15,600	16,700	17,700	18,800	20,000	21,200
Demand totals	15,600	16,700	17,700	18,800	20,000	21,200
Difference (supply minus demand)	0	0	0	0	0	0
Difference as a percent of supply	0	0	0	0	0	0
Difference as a percent of demand	0	0	0	0	0	0

7.1.4 Projected Multiple-Dry Year Water Supplies Versus Demand

The projected water supplies are compared to the demands for multiple dry years for the City in Tables 7-3 through 7-6.

Table 7-3. (DWR Table 48) Multiple-Dry Year Water Supply and Demand Comparison, ac-ft/yr, Period ending in 2010

	2006	2007	2008	2009	2010
Supply totals	15,900	14,500	14,700	14,900	15,000
Demand totals	15,900	14,500	14,700	14,900	15,000
Difference (supply minus demand)	0	0	0	0	0
Difference as a percent of supply	0	0	0	0	0
Difference as a percent of demand	0	0	0	0	0

Table 7-4. (DWR Table 51) Multiple-Dry Year Water Supply and Demand Comparison, ac-ft/yr, Period ending in 2015

	2011	2012	2013	2014	2015
Supply totals	16,900	15,400	15,600	15,800	16,000
Demand totals	16,900	15,400	15,600	15,800	16,000
Difference (supply minus demand)	0	0	0	0	0
Difference as a percent of supply	0	0	0	0	0
Difference as a percent of demand	0	0	0	0	0

Table 7-5. (DWR Table 54) Multiple-Dry Year Water Supply and Demand Comparison, ac-ft/yr, Period ending in 2020

	2016	2017	2018	2019	2020
Supply totals	17,900	16,300	16,500	16,700	16,900
Demand totals	17,900	16,300	16,500	16,700	16,900
Difference (supply minus demand)	0	0	0	0	0
Difference as a percent of supply	0	0	0	0	0
Difference as a percent of demand	0	0	0	0	0

Table 7-6. (DWR Table 57) Multiple-Dry Year Water Supply and Demand Comparison, ac-ft/yr, Period ending in 2025

	2021	2022	2023	2024	2025
Supply totals	19,000	17,300	17,600	17,800	18,000
Demand totals	19,000	17,300	17,600	17,800	18,000
Difference (supply minus demand)	0	0	0	0	0
Difference as a percent of supply	0	0	0	0	0
Difference as a percent of demand	0	0	0	0	0

**Table 7-7. Multiple-Dry Year Water Supply and Demand Comparison,
 ac-ft/yr, Period ending in 2030**

	2026	2027	2028	2029	2030
Supply totals	20,200	18,400	18,600	18,900	19,100
Demand totals	20,200	18,400	18,600	18,900	19,100
Difference (supply minus demand)	0	0	0	0	0
Difference as a percent of supply	0	0	0	0	0
Difference as a percent of demand	0	0	0	0	0

7.2 Water Shortage Expectations

Despite projected groundwater reductions of five and ten percent in multiple dry years three and four, with anticipated dry year demand cutbacks of ten percent, the City does not experience any water shortages with exclusive groundwater supplies. Furthermore, once surface water supplies are available, water shortages are likewise not projected with deep aquifer groundwater supplies meeting demands during those dry years when surface water is reduced. In these years, with no use during previous wet years, no groundwater supply reductions are expected.

However, based on experiences during the 1987-1992 drought, the community recognizes that it is better to enter into a water shortage alert early, at a minimal level, to establish necessary water use reduction programs and policies, to gain public support and participation, and to reduce the likelihood of more severe shortage levels later. As the community continues to become more water efficient, it may become more difficult for customers to reduce their water use during water shortages (this is called “demand hardening”). Based on observations to date, it does not appear that City customers are yet approaching demand hardening. There are still reasonable water efficiency improvements available in landscaping irrigation practices community-wide when comparing irrigation demands and local climatic conditions. There are additional opportunities for residential and commercial plumbing fixture and appliance replacements with new low water using products. And there may be water savings observed from recent retrofitting and metering efforts (construction water and El Macero). However, improved water use efficiency does mean that water supply reserves must be larger and that water shortage responses must be made early to prevent severe economic and environmental impacts.

The City assesses its water supply conditions annually, considering both hydrologic and water system conditions. Based on the water shortage stages and triggers, a water shortage condition may be

declared. The driest recent three-year historic sequence for the City's water supplies was from 1990 to 1992. Because shortages can have serious economic and environmental impacts, the City will make every effort to achieve the long term 20 percent reduction target, thereby reducing the likelihood of triggering more severe shortages and demand reductions. As a forecasting tool, the City also watches the status of surface water deliveries from Clear Lake and Indian Valley Reservoirs to farmers, and considers delivery cutbacks to be a precursor for drought and/or potential water shortage conditions and increased groundwater reliance by agricultural customers in the vicinity.

7.3 Water Shortage Contingency

In 1992, in accordance with the requirements of Assembly Bill 11, the City developed a comprehensive water shortage contingency plan. The complete plan is included in Appendix C. Accordingly, this plan would be incorporated into any actual City emergency response activity affecting the water supply. The City's plan is consistent with provisions in the state regulations pertaining to water planning. The plan contains procedures for the distribution and allocation of potable water in a water shortage condition or disaster. These procedures are consistent with guidelines prepared by the California State Office of Emergency Services.

The Water Shortage Contingency Plan is structured to be activated through authorization by the City Council. Prior to any Council action, the Natural Resources Commission would review the recommendation and provide feedback to the Council on the proposed action. Under a water shortage condition, the actual water supply and demand information and conditions would be assessed to determine whether activating the plan is warranted. If so, City staff would recommend activation of the appropriate stage alert, and request Council authorization to initiate the measures necessary to achieve the appropriate demand reduction target. The public would be encouraged to understand and be involved in the decision-making process, and provide feedback to the Council on such an action. The response plan is flexible, and can be implemented to best match actual conditions of a particular water shortage event.

During the short intense drought event of 1976-77, City groundwater levels dropped severely. This was due in part to increased agricultural pumping to compensate for reduced raw surface water deliveries. During the 1986-92 drought, the community was better prepared to handle drought impacts, due to: (1) the adoption by the City Council of a "No-Waste" Ordinance in the early 1990's;

(2) initiation of a meter retrofit program in 1990 heightening customer awareness; and (3) implementation of conservation programs, including toilet rebates for replacements, water audits on request, distribution of toilet leak detection dye tablets for all residential customers, regular newsletter communications to the community and an educational water conservation program with the local schools. An approximate 10 percent reduction in per capita water demand was achieved.

7.3.1 Stages of Action

The City has developed a four-stage water shortage contingency plan, as shown in Table 7-8, to invoke during declared water shortages. The rationing plan includes voluntary and mandatory rationing, depending on the causes, severity, and anticipated duration of the water supply shortage.

Table 7-8. (DWR Table 23) Water Supply Shortage Stages and Conditions

Stage	Groundwater Level Trigger (feet)	Water Supply Shortage Conditions (%)	Demand Reduction Goal	Per Capita Target (GPCD ^a)
1	-100	10	10% Voluntary	207
2	-120	20	20% Voluntary	185
3	-130	30	30% Drought Rates / Mandatory	161
4	-140	50	50% or > Drought Rates / Mandatory	115

^a GPCD, gallons per capita per day

The initial Stage 1 demand reduction of 10 percent coincides with one or more months of static water levels below 110 feet. The approach of the City’s water shortage reduction plan is to gradually reduce groundwater pumping as groundwater levels decline, and hydrologic conditions worsen. In the more severe stages, the implementation of a temporary drought water rate schedule is planned which would help all user classes achieve necessary demand reductions to meet given shortage level goals. A 50 percent reduction in demands versus historic average is triggered with one or more months at or below 140 feet below the ground surface, considered to be the worst case scenario. The City has not triggered its water shortage contingency plan since it was developed. Recent per capita use has fluctuated in the 200-207 gpd range.

Under a water shortage conditions, the City would continue to implement BMPs as part of its overall long term demand management program. The City would likely increase media attention to the water supply situation during a shortage. And would step up public water education programs, encourage property owners to request a landscape and interior water use survey, and continue to

advertise the importance to customers of installing water efficient appliances and fixtures (e.g. toilets, clothes washers).

Priority by Use. Priorities for use of available potable water during shortages were based on the difference between basic needs (e.g. drinking, toilet flushing) and discretionary uses (e.g. landscape irrigation), and legal requirements set forth in the California Water Code, Sections 350-358. Water allocations are established for all customers according to the following ranking method:

- Minimum health and safety allocations for interior residential needs (includes single family, multifamily, hospitals and convalescent facilities, retirement and mobile home communities, and student housing, and fire fighting and public safety)
- Commercial, industrial, institutional/governmental operations (where water is used for manufacturing and for minimum health and safety allocations for employees and visitors), to maintain jobs and economic base of the community (not for landscape uses)
- Existing landscaping
- New customers, proposed projects without permits when shortage declared.

It is not expected that any potable water supply reductions would result in recycled water shortages. However, this may change in the future if there are more water commitments for water reclamation uses.

Triggering Mechanisms. As the water purveyor, the City must provide the minimum health and safety water needs of the community at all times. The water shortage response is designed to provide a minimum of 50 percent of normal supply during a severe or extended water shortage. The water shortage contingency plan triggering levels shown below were established to ensure that this goal is met.

Although an actual shortage may occur at any time during the year, a shortage condition can usually be forecasted by the water division on or about May 1 each year. The City monitors water production and groundwater level data on a monthly basis. This information is useful for tracking the potential impacts on the City's water supply during a dry period. It is possible that peak demand

groundwater levels could drop more severely (June-August) in a given year, making it difficult to forecast the activation of a water shortage response stage in advance of such a condition.

Water shortage contingency plan stages may be triggered by a supply shortage or by contamination in one or more wells, or a combination of both. Because shortages can overlap stages, triggers automatically implement the more restrictive stage reduction if voluntary efforts are not successful in meeting demand reduction goals.

Specific criteria for triggering the City's rationing stages are shown in Table 7-9.

Table 7-9. Water Shortage Contingency Stages and Triggering Mechanisms

Water Supply Condition	% Supply Reduction			
	Stage 1 Up to 10%	Stage 2 20%	Stage 3 30%	Stage 4 50% or >
Current Supply	Total supply is 85-90% of "normal" & Below "normal year is declared OR	Total supply is 75-85% of "normal" OR 3 rd consecutive dry year is declared OR	Total supply is 65-75% of "normal" OR 4 th consecutive dry year is declared OR	Total supply is less than 85% of "normal" OR 5 th consecutive dry year is declared OR
Future Supply	Projected supply insufficient to provide 90% of "normal" deliveries for the next two years OR	Projected supply insufficient to provide 80% of "normal" deliveries for the next two years OR	Projected supply insufficient to provide 70% of "normal" deliveries for the next two years OR	Projected supply insufficient to provide 50% of "normal" deliveries for the next two years OR
Groundwater	No excess groundwater pumping undertaken OR	No excess groundwater pumping undertaken OR	Excess deep well groundwater pumping undertaken OR	No excess supply OR Well limitations to reduce supply availability OR
Water Quality	1 to 2 wells exceed primary drinking water standards	2 to 3 wells exceed primary drinking water standard	3 to 4 wells exceed primary drinking water standard	5 or more wells exceed primary drinking water standard OR
Disaster Loss	N/A	N/A	N/A	Disaster Loss

7.3.2 Three-Year Minimum Water Supply

The three-year minimum water supply is presented in Chapter 4. Table 7-10 summarizes the estimate of the minimum water supply available during each of the next three water years based upon the driest three-year historic sequence (1990 – 1992) for the City.

Table 7-10. (DWR Table 24) Three-Year Estimated Minimum Water Supply ac-ft/yr

Source	Normal ^a	Year 1 ^b	Year 2 ^b	Year 3 ^b
Groundwater wells	15,900	15,900	14,500	14,700
Surface Water ^c	0	0	0	0
Recycled water	0	0	0	0
Total	15,900	15,900	14,500	14,700

^aThis is the projected supply for a normal 2006 year.

^bThis represents the 2006 through 2008 year sequence (based on Table 4-12 in Chapter 4). Groundwater is expected to decrease 0%, 10% and 15% in single and multiple-dry-years two and three, respectively.

^cSurface water supplies are projected to come online by 2020.

7.3.3 Catastrophic Supply Interruption Planning – Emergency Response Plan

The City has prepared a security vulnerability assessment and maintains an Emergency Response Plan to address responding to catastrophic supply interruptions as well as other emergencies. Due to security reasons, only the Emergency Response Plan Table of Contents is included in this document in Appendix G.

During declared shortages, or when a shortage declaration appears imminent, the Public Works Director, would be in charge of managing related activities. The Director would coordinate efforts with the City Manager and other Departments including water, fire, planning, police, parks and recreation, and the City Manager’s Office. During a declared water shortage, the City would not accept applications for new building permits. If the shortage condition warrants, permit issuance policy may need to be evaluated and modified until the shortage declaration is rescinded.

The City has four emergency generators available keep several wells online during a water shortage event. In addition the City has a new 4-million gallon water storage tank, brought online in Fall 2002, that provides needed emergency backup and fire fighting capacity. These improvements are particularly useful should a shortage be caused by a power outage or other natural disaster. All existing water supply storage, treatment, and distribution, and wastewater treatment facilities are inspected per a maintenance schedule.

The following Table 7-11 summarizes the actions the City will take during a water supply catastrophe.

Table 7-11. (DWR Table 23) Preparation Actions for a Catastrophe

Possible catastrophe	Potential actions
<ul style="list-style-type: none"> • Earthquake • Fire/explosion • Medical • Flood • Tornado/severe weather • Bomb threat • Hard freeze • Loss of normal water supply • Hazardous material release • Contamination of District water supplies • Terrorist attack 	<ul style="list-style-type: none"> • Stretch existing water storage • Obtain additional water supplies • Develop alternative water supplies • Determine where the funding will come from • Contact and coordinate with other agencies • Create an Emergency Response Team/Coordinator • Create a catastrophe preparedness plan • Put employees/contractors on-call • Develop methods to communicate with the public • Develop methods to prepare for water quality interruptions

7.3.4 Prohibitions, Consumption Reduction Methods, and Penalties

Mandatory prohibition consumption reduction methods and penalties in the City’s water shortage contingency plan are presented in Appendix C and discussed in this section. The City’s "No Waste" Ordinance (see Appendix C) includes prohibitions on various wasteful water uses such as offsite irrigation runoff, washing sidewalks and driveways with potable water, and allowing plumbing leaks to go uncorrected more than 24 hours after customer notification.

In Stage 1 and 2 shortages, customers may adjust either interior or outdoor water use (or both), in order to meet the voluntary water reduction goal. However, under Stage 3 and Stage 4 mandatory rationing programs, the City would enhance fixture and appliance replacement programs to encourage the installation of highly water efficient models. This would reduce potential impacts on lifestyle as a result of demand reductions. Those customers who already have several water efficient fixtures would likely not be impacted by an established health and safety allotments or usage targets. More reliance on outdoor water savings would be required to meet water shortage contingency plan demand reduction targets.

Stage 4 mandatory rationing, which is likely to be declared only as the result of a prolonged water shortage or as a result of a disaster, would require that customers make changes in their interior water use habits (for instance, not flushing toilets unless “necessary” or taking less frequent showers). All irrigation usage would be eliminated, or greatly limited in a severe water shortage condition.

Table 7-12 provides a summary of the mandatory prohibitions and the stage when the prohibitions become mandatory.

Table 7-12. (DWR Table 26) Mandatory Prohibitions

Prohibitions	Stage when prohibition becomes mandatory
Street/sidewalk cleaning	2
Washing cars (residential)	3
Watering lawns/landscapes	3
Uncorrected plumbing leaks	1
Gutter flooding	1
No refilling or filling of pools	3
Car wash facilities (must use recycled water)	2
No new connections	4

The City will follow a community-wide per capita demand reduction method for residential customers. Commercial, industrial, and City facility user classes would follow a user class reduction goal. And landscape-only accounts would meet reductions based use per acre and local evapotranspiration data. In general, the majority of savings would come from the single family residential (SFR) and multi-family residential (MFR) sectors which represent about 80 percent of the metered demands in the water system.

As it relates to meeting a user class goal, the very low water users in each sector would be relatively unaffected by prescribed demand reductions. High water users would be asked to curtail their discretionary uses in particular as water shortage conditions worsen. Special temporary rates would be introduced for stages 3 and 4 to encourage demand reduction and to meet conservation targets. No specific account allocations or allotments are proposed unless the public and/or City Council choose to adopt such an approach in the future.

The City classifies each customer in the utility billing software to ensure equitable billing for water service. A multi-year water use history is maintained in the billing software database. The City provides internet bill access capability to customers so they can easily access the past several years of their water use. This would be particularly useful during a water shortage condition for both the City and its customers. In summary, the goal would be to meet the community demand reduction

goal by having each user class meet their proportional share. The consumptive reduction methods are summarized in Table 7-13.

Table 7-13. (DWR Table 27) Consumption Reduction Methods

Examples of consumption reduction methods	Stage when method takes effect	Projected reduction, %
Demand reduction program	All Stages	10-50
Reduce pressure in water lines	4	50
Restrict building permits	Will be considered	
Use prohibitions	3 and 4	30-50
Water shortage pricing	3 and 4	30-50
Per capita allotment by customer type	3 and 4	30-50
Plumbing fixture replacement	1 and 2	10-20
Voluntary rationing	1 and 2	10-20
Mandatory rationing	3 and 4	30-50
Incentives to reduce water consumption	Will be considered	
Education Program	All Stages	10
Percentage reduction by customer type	3 and 4	30-50

Any customer violating the regulations and restrictions on water use set forth in the “No Waste” Ordinance shall receive a written warning for the first and second violations. Upon a third violation, the customer shall receive a written warning and the City may cause a flow-restrictor to be installed in the service. If a flow-restrictor is placed, the violator shall pay the cost of the installation and removal. Additional violations may cause the City to temporarily terminate water service until water waste violations are remedied. The City would prefer to avoid such actions and would work with customers diligently to this end before taken any severe corrective action. During a severe water shortage, enforcement would be critical to preserve valuable limited water supplies. If water service is terminated, it shall be restored only upon payment of the turn-on charge fixed by the City Council. The penalties and changes are summarized in Table 7-14.

Table 7-14. (DWR Table 28) Penalties and Charges

Examples of penalties and charges	Stage when penalty takes effect
Penalties for not reducing consumption	2
Termination of service and reconnect fee	4

7.3.5 Analysis of Revenue Impacts of Reduced Sales During Shortages

All revenues the City collects that are not expended in the same year on system operations and maintenance or capital improvements are used to fund deferred maintenance and to complete necessary capital improvements, such as main and well replacements. The City understands the projected ranges of water sales by shortage stage and what the impact would be on projected revenues and expenditures by each shortage stage. Special rates would have to be adopted to avoid severe financial hardship during a water shortage condition.

In Stage 1 and 2 conditions, the City would attempt to avoid rate adjustments. However if the water shortage conditions persisted and/or became more severe thereby further reducing demands, rate changes would be imperative.

Table 7-15 summarizes the proposed measures to overcome revenue impacts.

Table 7-15. (DWR Table 29) Proposed Measures to Overcome Revenue Impacts

Name of measures	Summary of effects
Rate adjustment	The magnitude of water rate increases during a severe water shortage condition would be as follows: 25 percent rate increase at Stage 3; 40 percent rate increase at Stage 4. If severe water shortage conditions persisted, further rate increases would be needed to remain solvent as a water utility. To cover increased expenses and decreased sales, rate increases would need to be "severe", however would be relatively short term in nature.

Table 7-16 summarizes the proposed measures to overcome expenditure impacts.

Table 7-16. (DWR Table 30) Proposed Measures to Overcome Expenditure Impacts

Name of measures	Summary of effects
Development of reserves	The City has a reserve policy (contingency fund) in place to help offset expenditure impacts during times of emergency.

7.3.6 Reduction Measuring Mechanisms

Under normal water supply conditions, potable water production figures are recorded daily. Daily totals are reported monthly by the water division. The City runs its water system on a computerized SCADA system, which allows instantaneous viewing of water system conditions.

During a Stage 1 or 2 water shortage, weekly production figures would be evaluated during the peak period to determine if demand reduction targets were being met. The water division would compare the weekly production to the target weekly production to verify that the reduction goal is being met. The Public Works Director would review the weekly production reports and determine if further action is required to demand reduction goals. Monthly production reports would be sent to the City Council. If reduction goals are not met, the Director would notify the City Council so that corrective action could be considered and/or taken.

During a Stage 3 or 4 water shortage, the procedure listed above will be followed, with the addition of a daily production report to the water division manager. During emergency shortages, production figures would be reviewed during peak demand periods and reported to the water division manager. Daily production reports would also be maintained for review if necessary for the Director and/or City Council.

Table 7-17 summarizes the City's water use monitoring mechanisms.

Table 7-17. (DWR Table 31) Water Use Monitoring Mechanisms

Mechanism for determining actual reduction	Type and quality of data expected
Water production meters	Use will be monitored from the water production meters on a daily or weekly basis, dependant upon the severity of the water shortage. Production meters are accurate within +/- 5 percent.
Customer records	All customers are metered, therefore customer accounts can be grouped by type or by specific customers to monitor usage. Data will be evaluated monthly depending on situation. Data is based on customer meters which are accurate within +/- 1 percent.

CHAPTER 8 REFERENCES

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APPENDIX A

Notice of Public Hearing



Notice of Public Hearing

The Davis City Council will conduct a Public Hearing to consider adopting the 2005 Urban Water Management Plan (Plan) described below on May 16, 2006 in the Community Chambers, 23 Russell Boulevard, Davis, California. The Council meeting begins at 6:30 p.m. however; please contact the City Manager's office for the approximate time this item will be heard.

APPLICATION: City of Davis

LOCATION: Incorporated area of the City of Davis

DESCRIPTION: The Public Hearing is to consider the adoption of the proposed 2005 Urban Water Management Plan. The Plan intends to establish programs and policies that enable the city to meet its long term 20 percent per capita reduction goal vs. pre-metered conditions. In 2005 the city achieved a 16 percent per capita water use reduction. The proposed actions in the Plan are expected to enable the city to meet its demand reduction target by 2010. The Plan reviews recent and proposed water conservation program activities, and evaluates the ability of the city to meet future water supplies and demands under various water shortage and emergency conditions. The Plan follows the requirements of the urban water management planning act.

The Plan document is available for review on the city's website (www.cityofdavis.org), at the Public Library on 14th street in the Government Publications section, or at Davis Public Works, 1717 Fifth Street, Davis, California 95616, (530) 757-5686. Staff Reports for the Public Hearing are generally available 5 days prior to the hearing dates.

PUBLIC COMMENTS: Any person interested, including all persons owning property in the City, may appear and be heard as to whether the proposed rates and changes are discriminatory or excessive, or will not be sufficient under Government Code Section 545615, or will not comply with any other provisions of the Revenue Bond Law of 1941 (Government Code Sections 54300 and following), or will not be sufficient under the provisions or covenants of any outstanding revenue bonds of the City payable from the revenues of the water or sewer system, or on any other matter relating to the proposed ordinance and the rates or changes proposed therein.

The City of Davis does not transcribe its proceedings. Persons who wish to obtain a verbatim record should arrange for attendance by a court report or for some other acceptable means of recordation. Such arrangements will be at the sole expense of the person requesting the recordation.

If you challenge the action(s) taken on this matter in court, the challenge may be limited to raising only those issues raised during the Public Hearing described in this Notice, or in written correspondence delivered to the City Clerk at, or prior to, the Public Hearing.

April 21, 2006

/s/: Margaret Roberts, CMC, City Clerk

2005 Urban Water Management Plan

Every five years the city is required to complete and file an UWMP update with the California Department of Water Resources (DWR) in order to comply with the provisions of the urban water management planning act. The last update to the city's UWMP was completed in 2000.

Water Conservation Program Savings Goal

The city established its water conservation program in 1990 with the intention of achieving a 20 percent reduction in per capita water use vs. the pre-metered period. The table below summarizes the goal in this context as follows:

20 Percent Per Capita Water Savings Goal Summary

Context	Per Capita Water Use	Time
Pre-metered condition	230 gallons/capita/day	1970-1990 Avg.
Calendar Year 2005	192 gallons/capita/day	2005
20 percent savings goal	184 gallons/capita/day	By 2010

Much of the content and format of the UWMP is dictated by the law requiring completion of such plans. In addition, the city identifies projects/actions to be implemented during the five year plan period (2006-10) that would accomplish demand management goals and per capita water use targets which are summarized below.

Summary of Proposed 2006-10 UWMP Projects/Actions

Project/Action	Description	Implementation
Regional Clothes Washer Rebate Program (300/yr.)	Continue rebate program using Prop. 50 grant funds	2006-07 2007-08
Regional ET Controller Pilot Program (69 SFR/10 Comm.)	State-wide pilot program to study ET Controller efficiency	2006-07 2007-08
California SFR Water Use Efficiency Study	State-wide study to identify potential savings from BMPs	2006-07 2007-08
Pre-Rinse Spray Valve Program	Participate in state-wide effort to retrofit restaurants	2006-10
Water System Leak Detection Survey	Identify system water losses and repair leaks	2008
Parks Water Budget Program	BMP 5 Implementation	2007-2009
Update Landscape Water Conservation Ordinance	Comply with new requirements/Task Force rec.	2007-2009
Update Water Shortage Contingency Plan	Update plan provisions and methods – 10+ years old	2008-2009

The Natural Resources Commission reviewed the Plan at their March 2006 meeting and other agencies have had the opportunity to review the document as well. Upon adoption, the Plan would be submitted to DWR as required by state law.

Review Guidance

Because many of the tables and information are required in all UWMP, like the long term projections for demand and supply, the real focus of the review should be on the existing activities and how that will result in meeting the city's long term 20% per capita water savings target. Since the last plan in 2000, the city has metered El Macero and construction water, implemented two-tier metered rates for SFR customers, and implemented both residential and commercial clothes washer rebate programs through regional MOUs.

APPENDIX B

Urban Water Management Plan Adoption Resolution

RESOLUTION 06-97, SERIES 2006

**RESOLUTION OF THE CITY COUNCIL OF THE CITY OF DAVIS
TO ADOPT ITS 2005 URBAN WATER MANAGEMENT PLAN (UWMP) AS
REQUIRED BY THE URBAN WATER MANAGEMENT PLANNING ACT (ACT)**

WHEREAS, water suppliers in California who serve at least 3,000 customers and/or provide at least 3,000 acre-feet per year are required to complete urban water management plans every five years under the ACT; and

WHEREAS, the City of Davis has prepared and adopted UWMPs in 1990, 1995 and 2000, and submitted these plans to the California Department of Water Resources (DWR) as required by the ACT; and

WHEREAS, the 2005 UWMP has been prepared in compliance with all requirements in the ACT and made available for public review; and

WHEREAS, the Natural Resources Commission has reviewed the UWMP at their March 2006 meeting, member agencies of the WRA have been encouraged to review and comment on the city's 2005 UWMP document, and the UWMP document has been made available for public review on the city's website, at Davis Public Works and at the Public Library.; and

WHEREAS, a properly noticed public hearing has been conducted to encourage public input on the city's 2005 UWMP prior to adoption.

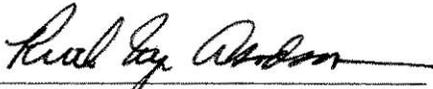
NOW, THEREFORE, BE IT RESOLVED, that the City Council of the City of Davis, upon review of its 2005 Urban Water Management Plan with consideration of public input received during the public hearing, hereby authorizes the City Manager to submit the city's 2005 Urban Water Management Plan to DWR as required by state law.

PASSED AND ADOPTED by the City Council of the City of Davis, this thirteenth of June 2006, by the following vote:

AYES: GREENWALD, PUNTILLO, SAYLOR, SOUZA, ASMUNDSON

NOES: NONE

ABSENT: NONE



Ruth Uy Asmundson
Mayor

ATTEST:



Margaret Roberts, CMC
City Clerk

APPENDIX C

Water Shortage Contingency Plan

THE SIX STEPS OF WATER SHORTAGE CONTINGENCY PLANNING

STEP 1 – Forecast supply in relation to demand

- a. supply by source for next three years
- b. demand by account type for next three years
- c. supply/demand balance for next three years

STEP 2 – Assess water shortage mitigation options

- a. increase supply
- b. reduce demand

STEP 3 – Establish rationing stages & triggering levels

- a. set demand reduction objectives
- b. determine triggers by supply source

STEP 4 – Develop customer allotment methods

- a. water use priorities
- b. allotment method by account type
- c. specific use prohibitions
- d. new demand
- e. public involvement

STEP 5 – Administration of the rationing program

- a. revenue plan
- b. staff/support/training
- c. customer notification & assistance
- d. appeals
- e. enforcement
- f. media relations
- g. monitoring demand
- h. coordination with other agencies

STEP 6 – Adoption of the plan

- a. enabling ordinances
- b. public involvement

RESOLUTION NO. ⁶⁹²⁰, SERIES 1992

A RESOLUTION OF THE CITY OF DAVIS
ESTABLISHING A WATER SHORTAGE CONTINGENCY PLAN
IN THE EVENT OF SHORTFALLS IN THE WATER SUPPLY SYSTEM

WHEREAS, the City of Davis relies on local groundwater for all of its water supply, which is replenished by rainfall;

WHEREAS, rainfall fluctuates annually and can result in extended periods of below average replenishment and water supply availability;

WHEREAS, a multiple stage Water Shortage Contingency Plan has been prepared that prescribes appropriate responses to varying levels of projected shortfall in available water supply;

WHEREAS, the various Plan stage(s) may be activated when certain water supply system conditions are met, thereby triggering reductions in normal water consumption to balance supply and demand; and

WHEREAS, the Water Shortage Contingency Plan complies with AB11 and is hereby established as part of the city's long-term water management program.

NOW, THEREFORE, BE IT RESOLVED that the Davis City Council does hereby establish the following:

The Water Shortage Contingency Plan, attached hereto as Exhibit A and by this reference made a part hereof, provides the City with a water shortage response plan in the event of a water supply shortfall that may adversely affect the community.

The Water Shortage Contingency Plan is hereby incorporated into the City's 1990 Urban Water Management Plan Update as required per AB797, to be filed with the California Department of Water Resources.

PASSED AND ADOPTED this 6th day of MAY, 1992,
the following vote:

YES: ADLER, BOYD, ROSENBERG, WOLK, SKINNER

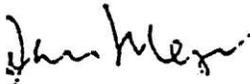
YES: NONE

SENT: NONE



MAYNARD SKINNER
MAYOR

TEST:



DAN MEYER
CITY MANAGER/CITY CLERK

WJD

EXHIBIT 'A'

City of Davis
Water Shortage Contingency Plan

Purpose.

Resolution No. ____ is adopted to assure that the City is prepared to respond to water shortage conditions caused by droughts or events that impact the water supply by conserving water to maintain the City's municipal water supply. The City depends solely on local groundwater whose availability depends on adequate rainfall. As illustrated by four of the last five years, extended periods of below average rainfall can occur, causing below average replenishment of the groundwater basin and, in turn, reducing available water supplies. The local groundwater supplies can be protected and conserved through water conservation measures. The Water Shortage Contingency Plan establishes a four (4) stage response strategy to accomplish additional water conservation to safeguard the City's water supply should drought conditions persist in the present or future. Stage 1 is intended to achieve a 10 percent reduction in normal water consumption. Stages 2, 3 and 4 are intended to achieve subsequent reductions in potable water consumption by 20%, 30% and 40%, respectively.

1. Declaration of Water Shortage Condition and Establishment of Requirements.
 - A. The Public Works Director, upon annually assessing the City's water supply condition to determine whether a normal or below normal water supply is available, will report such an assessment to the City Council during the month of March. The assessment will be based on, but not limited to the following factors which could adversely affect the City's water supply:
 - (1) Average static water levels that for one or more months during a twelve month period reach a depth to groundwater from the surface of 110, 120, 130 or 140 feet constituting, respectively a Stage 1, Stage 2, Stage 3, or Stage 4 condition;
 - (2) Local factors such as degradation of water quality or subsidence of the groundwater basin;
 - (3) Regional factors such as above normal groundwater extraction by agricultural operators and other users;
 - (4) Unforeseen events such as well or water system failures that decrease the pumping capacity of the City water system;
 - (5) Such other factors which the Public Works Director determines to be relevant to an assessment of the status of the City's water supply.
 - B. The City Council may, by resolution and after a noticed public hearing, determine that water shortage conditions exist within the City. Based on this determination, the City Council may determine that Stages 1, 2, 3 or 4 water shortage measures become operative within the City and remain in effect until the City Council, by resolution, determines that the water shortage condition no longer exists.
 - C. The Public Works Director shall have the authority in the event of a water shortage condition caused by short term emergency and/or unforeseen events to declare the appropriate water reduction level and corresponding Stage and measures.
 - D. Notice of the public hearing will be given by publication at least seven (7) days prior to the date of the public hearing.

If the Council determines that a STAGE 1 Water Shortage Condition exists, and for so long as this shortage exists, Section 28.5 of the City Municipal Code, prohibiting the waste of water, shall be strictly enforced. In addition, all water consumers, including City facilities, are encouraged to voluntarily comply with the following conservation measures, to achieve a 10 percent reduction in the community's normal water demand:

- A. Landscape irrigation is limited to three (3) days per week.
- B. Hosing of hardtop surfaces is limited to health and safety purposes.
- C. All hoses or filling apparatus for non-irrigation purposes shall be equipped with an automatic shutoff nozzle.
- D. Water is served in restaurants only upon request of the customer.
- E. Appropriate publicity will be conducted to encourage Davis residents to voluntarily comply with water conservation goals.

Upon adoption by the City Council of a resolution declaring a STAGE 2 Water Shortage Condition and for as long as the resolution remains in effect, all water consumers are encouraged to voluntarily comply with the following conservation measures, to achieve a 20 percent reduction in the community's normal water demand.

- Each of the Stage 1 water use regulations remain in full force and effect except as modified by this section.
- Landscape irrigation is limited to two (2) days per week.
- Boats and vehicles shall be washed only at commercial washing facilities equipped with water recycling equipment or by use of a bucket and hose equipped with an automatic shut-off nozzle.
- Water consumption in City facilities is reduced in aggregate by at least 20 percent.

Such other and further regulations as the City Council may determine, after the public hearing process, are necessary to achieve a 20 percent reduction in potable water consumption.

Upon adoption by the City Council of a resolution declaring a STAGE 3 Water Shortage Condition and for as long as the resolution remains in effect, the following water use regulations shall apply to all use of water within the City to achieve a mandatory 30 percent reduction in the community's normal water demand.

Each of the Stage 2 water use regulations remain in full force and effect except as modified by this section.

Landscape irrigation is limited to one (1) day per week.

The draining of all existing swimming pools, whether public, private, or commercial, shall be prohibited; except for protection of health and safety or structural integrity of the pool as determined by the Public Works Director or designated representative.

Water consumption in City facilities is reduced in aggregate by at least 30 percent.

- E. Such other and further regulations as the City Council may determine, after the public hearing process are necessary to achieve a 30 percent reduction in potable water consumption.
5. Upon adoption by the City Council of a resolution declaring a STAGE 4 Water Shortage Condition and for as long as the resolution remains in effect, the following water use regulations shall apply to all uses of water within the City to achieve a mandatory 40 to 50 percent, or greater, reduction in the community's normal water demand.
- A. Each of the Stage 3 water use regulations remain in full force and effect except as modified by this section.
 - B. Landscape irrigation for turfgrass is prohibited, and irrigation for non-turf plant materials is limited to one (1) day per week.
 - C. Water consumption in City facilities is reduced in aggregate by at least 40 percent.
 - D. Such other and further regulations as the City Council may determine, after the public hearing process, are necessary to achieve a 40 to 50 percent reduction in potable water consumption.
6. Enforcement
- A. All existing water use regulations will be in full force, except as modified by the Council, and remain in effect until the City Council, by resolution, determines that the water shortage condition no longer exists.
 - B. If the voluntary water conservation goals identified in the activated Stage(s) are not met, mandatory conservation measures deemed appropriate by the Public Works Director will be considered by the Council that will assure necessary conservation goals are achieved. Conversely, if water conservation goals are met through voluntary efforts even during severe shortage conditions, mandatory measures will not be utilized unless conservation goals are not met through voluntary measures.

JD:msb

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Plan Measures	Voluntary Measures			Mandatory Measures	
	STAGE 1	STAGE 2	STAGE 3	STAGE 4	STAGE 4
H2O Savings Goal (1)	10 %	20 %	30 %	40-50 %	
Water on request (2)	Yes	Yes			
Public Information	Yes	Yes			
Hosing hardtop surf.	Yes	Yes			
Auto-shutoff nozzle	Yes	Yes	Yes (M)		
Vehicle washing (3)		Yes			
No pool draining					
City Facilities Use	Reduced 10 %	Reduced 20 %	In Effect (M)	In Effect (M)	In Effect (M)
Landscape Irrigation (turfgrass watering prohibited STAGE 4)	3 days/week	2 days/week	Reduced 30%	Reduced >40%	Reduced >40%
	All landscaping	All landscaping	1 day/week (M)	1 day/week (M)	1 day/week (M)
			All landscaping	All landscaping	Nonturf only

Note: All measures are voluntary unless denoted with (M) for mandatory. Mandatory measures will only be instituted if necessary to meet conservation goals.

- (1) Water savings goal is a reduction in the community's historical water demand as stated in the 1990 Urban Water Management Plan.
- (2) Water is served only upon request of customer in restaurants.
- (3) Washing with commercial car wash or bucket with hose spray nozzle.

APPENDIX D

BMP Activity Reports and BMP Coverage Reports, 2003-2004

Reported as of 2/14/06

Water Supply & Reuse

Reporting Unit:

City of Davis, Public Works

Year:

2003**Water Supply Source Information****Supply Source Name**

Sacramento Valley GW Basin

Quantity (AF) Supplied

14547

Supply Type

Groundwater

Total AF: 14547

BMP 01: Water Survey Programs for Single-Family and Multi-Family Residential Customers

Reporting Unit: **City of Davis, Public Works** BMP Form Status: **100% Complete** Year: **2003**

A. Implementation

- 1. Based on your signed MOU date, 08/05/1994, your Agency STRATEGY DUE DATE is: 08/04/1996
- 2. Has your agency developed and implemented a targeting/marketing strategy for SINGLE-FAMILY residential water use surveys? yes
 - a. If YES, when was it implemented? 01/01/1995
- 3. Has your agency developed and implemented a targeting/marketing strategy for MULTI-FAMILY residential water use surveys? yes
 - a. If YES, when was it implemented? 01/01/1995

B. Water Survey Data

Survey Counts:	Single Family Accounts	Multi-Family Units
1. Number of surveys offered:	14232	507
2. Number of surveys completed:	253	1

Indoor Survey:

- 3. Check for leaks, including toilets, faucets and meter checks yes yes
- 4. Check showerhead flow rates, aerator flow rates, and offer to replace or recommend replacement, if necessary yes yes
- 5. Check toilet flow rates and offer to install or recommend installation of displacement device or direct customer to ULFT replacement program, as necessary; replace leaking toilet flapper, as necessary yes yes

Outdoor Survey:

- 6. Check irrigation system and timers yes yes
- 7. Review or develop customer irrigation schedule yes yes
- 8. Measure landscaped area (Recommended but not required for surveys) yes yes
- 9. Measure total irrigable area (Recommended but not required for surveys) yes yes
- 10. Which measurement method is typically used (Recommended but not required for surveys) Measuring Tape
- 11. Were customers provided with information packets that included evaluation results and water savings recommendations? yes yes
- 12. Have the number of surveys offered and completed, survey results, and survey costs been tracked? yes yes
 - a. If yes, in what form are surveys tracked? database
 - b. Describe how your agency tracks this information.

The City of Davis uses a work order recording system.

C. Water Survey Program Expenditures

This Year Next Year

1. Budgeted Expenditures	25000	25000
2. Actual Expenditures	23900	

D. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? No

a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

E. Comments

Reported as of 2/14/06

BMP 02: Residential Plumbing RetrofitReporting Unit:
City of Davis, Public WorksBMP Form Status:
100% CompleteYear:
2003**A. Implementation**

1. Is there an enforceable ordinance in effect in your service area requiring replacement of high-flow showerheads and other water use fixtures with their low-flow counterparts? no
- a. If YES, list local jurisdictions in your service area and code or ordinance in each:
2. Has your agency satisfied the 75% saturation requirement for single-family housing units? no
3. Estimated percent of single-family households with low-flow showerheads: %
4. Has your agency satisfied the 75% saturation requirement for multi-family housing units? no
5. Estimated percent of multi-family households with low-flow showerheads: %
6. If YES to 2 OR 4 above, please describe how saturation was determined, including the dates and results of any survey research.

B. Low-Flow Device Distribution Information

1. Has your agency developed a targeting/ marketing strategy for distributing low-flow devices? no
- a. If YES, when did your agency begin implementing this strategy?
- b. Describe your targeting/ marketing strategy.

Low-Flow Devices Distributed/ Installed	SF Accounts	MF Units
2. Number of low-flow showerheads distributed:	0	0
3. Number of toilet-displacement devices distributed:	0	0
4. Number of toilet flappers distributed:	0	0
5. Number of faucet aerators distributed:	0	0
6. Does your agency track the distribution and cost of low-flow devices? no		
a. If YES, in what format are low-flow devices tracked?		
b. If yes, describe your tracking and distribution system :		

C. Low-Flow Device Distribution Expenditures

	This Year	Next Year
1. Budgeted Expenditures	0	0
2. Actual Expenditures	0	

D. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? No
- a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

E. Comments

The City provides leak dye tablets to its water customers as part of the water audit, leak check and customer assistance outreach service (see BMP 1). The City regularly publicizes its appliance rebate programs and availability of water conservation assistance. Showerheads and aerators are regulated by the National Energy Efficiency Standards, and are very affordable for customers to purchase and install independently. The city feels funding these activities would largely be a "free-rider" program since the market has been transformed and regulates the use of efficient showerheads and aerators in the marketplace.

Reported as of 2/14/06

BMP 03: System Water Audits, Leak Detection and Repair

Reporting Unit: **City of Davis, Public Works** BMP Form Status: **100% Complete** Year: **2003**

A. Implementation

1. Has your agency completed a pre-screening system audit for this reporting year? no
2. If YES, enter the values (AF/Year) used to calculate verifiable use as a percent of total production:
 - a. Determine metered sales (AF) 1219
 - b. Determine other system verifiable uses (AF) 325
 - c. Determine total supply into the system (AF) 1590
 - d. Using the numbers above, if (Metered Sales + Other Verifiable Uses) / Total Supply is < 0.9 then a full-scale system audit is required. 0.97
3. Does your agency keep necessary data on file to verify the values used to calculate verifiable uses as a percent of total production? yes
4. Did your agency complete a full-scale audit during this report year? no
5. Does your agency maintain in-house records of audit results or the completed AWWA audit worksheets for the completed audit? yes
6. Does your agency operate a system leak detection program? yes
 - a. If yes, describe the leak detection program:

The City operates their leak detection program on an "as-necessary" basis. When there's a leak, the City fixes it. Staff regularly reviews the water supply and demand data records and maintenance records, to confirm the unaccounted-for water losses system-side stay at or under 4 percent.

B. Survey Data

1. Total number of miles of distribution system line. 174.7
2. Number of miles of distribution system line surveyed. 0

C. System Audit / Leak Detection Program Expenditures**This Year Next Year**

1. Budgeted Expenditures
2. Actual Expenditures

D. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? yes
 - a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

The City operates their leak detection program on an "as-necessary" basis. When there's a leak, the City fixes it. Staff regularly review the water supply and demand data records, and maintenance records, to confirm that the unaccounted for water losses system-wide stay at or under the 4-5% range.

E. Comments

Reported as of 2/14/06

BMP 04: Metering with Commodity Rates for all New Connections and Retrofit of Existing

Reporting Unit: **City of Davis, Public Works** BMP Form Status: **100% Complete** Year: **2003**

A. Implementation

1. Does your agency require meters for all new connections and bill by volume-of-use? yes
2. Does your agency have a program for retrofitting existing unmetered connections and bill by volume-of-use? yes
 - a. If YES, when was the plan to retrofit and bill by volume-of-use existing unmetered connections completed? 01/01/1990
 - b. Describe the program:

The City is fully metered for all customer sectors. A meter retrofit project was implemented during the 1990-97 period. Separate meters were installed for SFR homes. A few retrofits for commercial, large landscapes, and institutional and governmental accounts were required to complete the project. Metered rates for all customer classes were adopted and effective for fy1998-99. All customer classes, except SFR, are on a two-tier inclining rate structure. SFR customers pay for water based on a single tier rate structure. All customers pay a base rate charge based on meter size.

3. Number of previously unmetered accounts fitted with meters during report year. 427

B. Feasibility Study

1. Has your agency conducted a feasibility study to assess the merits of a program to provide incentives to switch mixed-use accounts to dedicated landscape meters? no
 - a. If YES, when was the feasibility study conducted? (mm/dd/yy)
 - b. Describe the feasibility study:

2. Number of CII accounts with mixed-use meters. 0
3. Number of CII accounts with mixed-use meters retrofitted with dedicated irrigation meters during reporting period. 0

C. Meter Retrofit Program Expenditures

	This Year	Next Year
1. Budgeted Expenditures	0	0
2. Actual Expenditures	0	

D. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? yes
 - a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

This BMP is complete.

E. Comments

This BMP is complete.

BMP 05: Large Landscape Conservation Programs and Incentives

Reporting Unit:
City of Davis, Public Works

BMP Form Status:
100% Complete

Year:
2003

A. Water Use Budgets

- | | |
|--|-----|
| 1. Number of Dedicated Irrigation Meter Accounts: | 530 |
| 2. Number of Dedicated Irrigation Meter Accounts with Water Budgets: | 23 |
| 3. Budgeted Use for Irrigation Meter Accounts with Water Budgets (AF): | 1 |
| 4. Actual Use for Irrigation Meter Accounts with Water Budgets (AF): | 1 |
| 5. Does your agency provide water use notices to accounts with budgets each billing cycle? | yes |

B. Landscape Surveys

- | | |
|--|------------|
| 1. Has your agency developed a marketing / targeting strategy for landscape surveys? | yes |
| a. If YES, when did your agency begin implementing this strategy? | 01/01/1990 |
| b. Description of marketing / targeting strategy: | |

There is mutual collaboration between Public Works and Parks Department.

- | | |
|---|-----|
| 2. Number of Surveys Offered. | 530 |
| 3. Number of Surveys Completed. | 7 |
| 4. Indicate which of the following Landscape Elements are part of your survey: | |
| a. Irrigation System Check | yes |
| b. Distribution Uniformity Analysis | yes |
| c. Review / Develop Irrigation Schedules | yes |
| d. Measure Landscape Area | yes |
| e. Measure Total Irrigable Area | yes |
| f. Provide Customer Report / Information | yes |
| 5. Do you track survey offers and results? | yes |
| 6. Does your agency provide follow-up surveys for previously completed surveys? | yes |
| a. If YES, describe below: | |

The Parks department re-audits areas.

C. Other BMP 5 Actions

- | | |
|---|-----|
| 1. An agency can provide mixed-use accounts with ETo-based landscape budgets in lieu of a large landscape survey program. Does your agency provide mixed-use accounts with landscape budgets? | no |
| 2. Number of CII mixed-use accounts with landscape budgets. | 0 |
| 3. Do you offer landscape irrigation training? | yes |
| 4. Does your agency offer financial incentives to improve landscape water use efficiency? | no |

Type of Financial Incentive:	Budget (Dollars/	Number Awarded to Customers	Total Amount Awarded
-------------------------------------	-------------------------	------------------------------------	-----------------------------

	Year)		
a. Rebates	0	0	0
b. Loans	0	0	0
c. Grants	0	0	0

5. Do you provide landscape water use efficiency information to new customers and customers changing services? yes

a. If YES, describe below:

All new accounts must have a meter. All new Parks accounts are connected to the a central irrigation controller.

6. Do you have irrigated landscaping at your facilities? yes

a. If yes, is it water-efficient? yes

b. If yes, does it have dedicated irrigation metering? yes

7. Do you provide customer notices at the start of the irrigation season? yes

8. Do you provide customer notices at the end of the irrigation season? yes

D. Landscape Conservation Program Expenditures

	This Year	Next Year
1. Budgeted Expenditures	0	0
2. Actual Expenditures	0	

E. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? yes

a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

The City's primary irrigation meter accounts include its own Parks department, which manages its own budget. See comments below.

F. Comments

(1) The City has water budget accounts for its own parks. (2) The City assumes water budgets apply to accounts that are effectively ET controlled via a central irrigation control station, such that budgeted use equals actual use. (3) It is assumed accounts with water budgets use approximately 15% less water than non-budgeted accounts. Therefore, irrigation meter accounts with water budgets use approximately is 85% of the proportion of budgeted irrigation meter accounts to total irrigation meter accounts.

Reported as of 2/14/06

BMP 06: High-Efficiency Washing Machine Rebate Programs

Reporting Unit: **City of Davis, Public Works** BMP Form Status: **100% Complete** Year: **2003**

A. Implementation

1. Do any energy service providers or waste water utilities in your service area offer rebates for high-efficiency washers? no
 - a. If YES, describe the offerings and incentives as well as who the energy/waste water utility provider is.
2. Does your agency offer rebates for high-efficiency washers? yes
3. What is the level of the rebate? 188
4. Number of rebates awarded. 562

B. Rebate Program Expenditures

	This Year	Next Year
1. Budgeted Expenditures	54000	54000
2. Actual Expenditures	117414	

C. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? no
 - a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

D. Comments

(1) Rebates amounts of both \$150 and \$225 are offered. (2) The discrepancy between what the City budgets and actually pays is due to an expected DWR 75\$ match (as of 2002.)

BMP 07: Public Information Programs

Reporting Unit: **City of Davis, Public Works** BMP Form Status: **100% Complete** Year: **2003**

A. Implementation

1. Does your agency maintain an active public information program to promote and educate customers about water conservation? yes

a. If YES, describe the program and how it's organized.

The city promotes water conservation and other resource efficiencies in coordination with other city departments, local agencies and organizations (e.g. Chamber of Commerce). The city regularly provides conservation messages on the bi-monthly utility bill, distributes water related information to the community through community-wide newsletters and makes information available on the city's web site. The city's utility bill was redesigned to show gallons used per day for the last billing period compared to the same period the previous year (previously, the bill only indicated total billing period usage in billing units (one hundred cubic feet of water, which is 748 gallons). There is also a one-year water use history on the bill for water use tracking purposes by the customer.

2. Indicate which and how many of the following activities are included in your public information program.

Public Information Program Activity	Yes/No	Number of Events
a. Paid Advertising	no	0
b. Public Service Announcement	no	0
c. Bill Inserts / Newsletters / Brochures	yes	2
d. Bill showing water usage in comparison to previous year's usage	yes	
e. Demonstration Gardens	no	0
f. Special Events, Media Events	no	0
g. Speaker's Bureau	no	0
h. Program to coordinate with other government agencies, industry and public interest groups and media	yes	

B. Conservation Information Program Expenditures

	This Year	Next Year
1. Budgeted Expenditures	20000	20000
2. Actual Expenditures	20000	

C. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? No

a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

D. Comments

BMP 08: School Education Programs

Reporting Unit: **City of Davis, Public Works** BMP Form Status: **100% Complete** Year: **2003**

A. Implementation

1. Has your agency implemented a school information program to promote water conservation? yes

2. Please provide information on your school programs (by grade level):

Grade	Are grade-appropriate materials distributed?	No. of class presentations	No. of students reached	No. of teachers' workshops
Grades K-3rd	no	0	0	0
Grades 4th-6th	no	0	0	0
Grades 7th-8th	no	0	0	0
High School	no	0	0	0

3. Did your Agency's materials meet state education framework requirements? yes

4. When did your Agency begin implementing this program? 01/01/1996

B. School Education Program Expenditures

	This Year	Next Year
1. Budgeted Expenditures	5000	5000
2. Actual Expenditures	0	

C. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? No

a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

D. Comments

In the past the City has provided lots of information to schools, but has received little interested feedback from teachers and administrators.

Reported as of 2/14/06

BMP 09: Conservation Programs for CII Accounts

Reporting Unit:

City of Davis, Public Works

BMP Form Status:

100% Complete

Year:

2003**A. Implementation**

1. Has your agency identified and ranked COMMERCIAL customers according to use? no
2. Has your agency identified and ranked INDUSTRIAL customers according to use? no
3. Has your agency identified and ranked INSTITUTIONAL customers according to use? no

Option A: CII Water Use Survey and Customer Incentives Program

4. Is your agency operating a CII water use survey and customer incentives program for the purpose of complying with BMP 9 under this option? no

CII Surveys	Commercial Accounts	Industrial Accounts	Institutional Accounts
a. Number of New Surveys Offered	639	0	0
b. Number of New Surveys Completed	0	0	0
c. Number of Site Follow-ups of Previous Surveys (within 1 yr)	0	0	0
d. Number of Phone Follow-ups of Previous Surveys (within 1 yr)	0	0	0
CII Survey Components	Commercial Accounts	Industrial Accounts	Institutional Accounts
e. Site Visit	yes	no	no
f. Evaluation of all water-using apparatus and processes	no	no	no
g. Customer report identifying recommended efficiency measures, paybacks and agency incentives	no	no	no
Agency CII Customer Incentives	Budget (\$/Year)	No. Awarded to Customers	Total \$ Amount Awarded
h. Rebates	4750	3	1200
i. Loans	0	0	0
j. Grants	0	0	0
k. Others	0	0	0

Option B: CII Conservation Program Targets

5. Does your agency track CII program interventions and water savings for the purpose of complying with BMP 9 under this? yes

option?

- | | |
|---|------|
| 6. Does your agency document and maintain records on how savings were realized and the method of calculation for estimated savings? | yes |
| 7. Estimated annual savings (AF/yr) from site-verified actions taken by agency since 1991. | 0 |
| 8. Estimated annual savings (AF/yr) from non-site-verified actions taken by agency since 1991. | .064 |

B. Conservation Program Expenditures for CII Accounts

	This Year	Next Year
1. Budgeted Expenditures	10000	10000
2. Actual Expenditures	1200	

C. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? yes

a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

The City does not initiate audits or surveys to CII customers since many of the businesses in Davis are billed based on a two tier rate structure and many of the customers have relatively low water use. The City would provide an audit or survey for a CII customer upon request. Instead, the City participates in the LightWash high-efficiency washer rebate program. Furthermore, the City has no industrial accounts, and their institutional accounts consist primarily of unbilled City accounts.

D. Comments

This BMP is addressed with rebates for high-efficiency washing machines.

BMP 09a: CII ULFT Water Savings

Reporting Unit:

City of Davis, Public Works

BMP Form Status:

100% Complete

Year:

2003

1. Did your agency implement a CII ULFT replacement program in the reporting year? No
 If No, please explain why on Line B.
 10.

A. Targeting and Marketing

1. What basis does your agency use to target customers for participation in this program? Check all that apply.
- a. Describe which method you found to be the most effective overall, and which was the most effective per dollar expended.
2. How does your agency advertise this program?
 Check all that apply.
- a. Describe which method you found to be the most effective overall, and which was the most effective per dollar expended.

B. Implementation

1. Does your agency keep and maintain customer participant information? (Read the Help information for a complete list of all the information for this BMP.) no
2. Would your agency be willing to share this information if the CUWCC did a study to evaluate the program on behalf of your agency? No
3. What is the total number of customer accounts participating in the program during the last year ? 0

CII Subsector	Number of Toilets Replaced					Type Not Specified
	Standard Gravity Tank	Air Assisted	Valve Floor Mount	Valve Wall Mount		
4. a. Offices	0	0	0	0	0	0
b. Retail / Wholesale	0	0	0	0	0	0
c. Hotels	0	0	0	0	0	0
d. Health	0	0	0	0	0	0
e. Industrial	0	0	0	0	0	0
f. Schools: K to 12	0	0	0	0	0	0
g. Eating	0	0	0	0	0	0
h. Govern-	0	0	0	0	0	0

ment					
i. Churches	0	0	0	0	0
j. Other	0	0	0	0	0

5. Program design. Rebate or voucher

6. Does your agency use outside services to implement this program? No

a. If yes, check all that apply.

7. Participant tracking and follow-up. No follow-up

8. Based on your program experience, please rank on a scale of 1 to 5, with 1 being the least frequent cause and 5 being the most frequent cause, the following reasons why customers refused to participate in the program.

- a. Disruption to business 4
- b. Inadequate payback 5
- c. Inadequate ULFT performance 2
- d. Lack of funding 3
- e. American's with Disabilities Act 0
- f. Permitting 1
- g. Other. Please describe in B. 9. 0

9. Please describe general program acceptance/resistance by customers, obstacles to implementation, and other issues affecting program implementation or effectiveness.

The city had offered the toilet rebate program to all users during the 1992-2001 period, but very few CII customers had taken advantage of this program.

10. Please provide a general assessment of the program for this reporting year. Did your program achieve its objectives? Were your targeting and marketing approaches effective? Were program costs in line with expectations and budgeting?

N/A

C. Conservation Program Expenditures for CII ULFT

1. CII ULFT Program: Annual Budget & Expenditure Data

	Budgeted	Actual Expenditure
a. Labor	0	0
b. Materials	0	0
c. Marketing & Advertising	0	0
d. Administration & Overhead	0	0
e. Outside Services	0	0
f. Total	0	0

2. CII ULFT Program: Annual Cost Sharing

a. Wholesale agency contribution	0
b. State agency contribution	0

c. Federal agency contribution	0
d. Other contribution	0
e. Total	0

D. Comments

The city has offered the toilet rebate program to all users during the 1992-2001 period. Very few CII customers have taken advantage of this program.

Reported as of 2/14/06

BMP 11: Conservation Pricing

Reporting Unit:
City of Davis, Public Works

BMP Form
 Status:
100% Complete

Year:
2003

A. Implementation**Rate Structure Data Volumetric Rates for Water Service by Customer Class****1. Residential**

a. Water Rate Structure	Increasing Block
b. Sewer Rate Structure	Non-volumetric Flat Rate
c. Total Revenue from Volumetric Rates	\$0
d. Total Revenue from Non-Volumetric Charges, Fees and other Revenue Sources	\$0

2. Commercial

a. Water Rate Structure	Increasing Block
b. Sewer Rate Structure	Uniform
c. Total Revenue from Volumetric Rates	\$0
d. Total Revenue from Non-Volumetric Charges, Fees and other Revenue Sources	\$0

3. Industrial

a. Water Rate Structure	Service Not Provided
b. Sewer Rate Structure	Service Not Provided
c. Total Revenue from Volumetric Rates	\$0
d. Total Revenue from Non-Volumetric Charges, Fees and other Revenue Sources	\$0

4. Institutional / Government

a. Water Rate Structure	Uniform
b. Sewer Rate Structure	Uniform
c. Total Revenue from Volumetric Rates	\$0
d. Total Revenue from Non-Volumetric Charges, Fees and other Revenue Sources	\$0

5. Irrigation

a. Water Rate Structure	Increasing Block
b. Sewer Rate Structure	Uniform
c. Total Revenue from Volumetric Rates	\$0
d. Total Revenue from Non-Volumetric Charges, Fees and other Revenue Sources	\$0

6. Other

a. Water Rate Structure	Service Not Provided
b. Sewer Rate Structure	Service Not Provided
c. Total Revenue from Volumetric	

Rates \$0

d. Total Revenue from Non-Volumetric
Charges, Fees and other Revenue \$0
Sources

B. Conservation Pricing Program Expenditures

	This Year	Next Year
1. Budgeted Expenditures	0	0
2. Actual Expenditures	0	

C. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? yes

a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

The City contracts a rate study approximately every three years to analyze the effectiveness of its rate structure, and evaluate additional system considerations, while developing a new rate scheme. These analyses do include calculating the componenets requested above, however, accomplish the same goal.

D. Comments

Based on the City's billing system, the residential category includes both single family and multi-family users. The city also provides "city" (institutional/ government) service, but does not charge itself for use, so there is no revenue generated.

Reported as of 2/14/06

BMP 12: Conservation Coordinator

Reporting Unit: **City of Davis, Public Works** BMP Form Status: **100% Complete** Year: **2003**

A. Implementation

1. Does your Agency have a conservation coordinator? yes
2. Is this a full-time position? no
3. If no, is the coordinator supplied by another agency with which you cooperate in a regional conservation program ? no
4. Partner agency's name: N/A
5. If your agency supplies the conservation coordinator:
 - a. What percent is this conservation coordinator's position? 30%
 - b. Coordinator's Name Jacques Debra
 - c. Coordinator's Title Senior Utility Resource Specialist
 - d. Coordinator's Experience and Number of Years Utility and demand management, +15 years
 - e. Date Coordinator's position was created (mm/dd/yyyy) 01/01/1990
6. Number of conservation staff, including Conservation Coordinator. 3

B. Conservation Staff Program Expenditures

	This Year	Next Year
1. Budgeted Expenditures	83262	83833
2. Actual Expenditures	83262	

C. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? no
 - a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

D. Comments

Reported as of 2/14/06

BMP 13: Water Waste Prohibition

Reporting Unit: **City of Davis, Public Works** BMP Form Status: **100% Complete** Year: **2003**

A. Requirements for Documenting BMP Implementation

1. Is a water waste prohibition ordinance in effect in your service area? yes

a. If YES, describe the ordinance:

No person shall use or cause to be used any city water for the purpose of sprinkling streets or alleys, except such person as may be authorized by the director of public works, nor allow any water to run to waste in any gutter or otherwise, nor shall any city water be used for irrigation except as provided in this chapter. No person other than employees of the water department shall open any fire hydrant or attach any hose thereto for any purpose, without first obtaining written permission from the chief of the fire department or the director of public works. (Code 1964, *8-2.404.)

2. Is a copy of the most current ordinance(s) on file with CUWCC? yes

a. List local jurisdictions in your service area in the first text box and water waste ordinance citations in each jurisdiction in the second text box:

Willowbank, El Macero, City of Davis See B.2 below

B. Implementation

1. Indicate which of the water uses listed below are prohibited by your agency or service area.

a. Gutter flooding	yes
b. Single-pass cooling systems for new connections	no
c. Non-recirculating systems in all new conveyor or car wash systems	no
d. Non-recirculating systems in all new commercial laundry systems	no
e. Non-recirculating systems in all new decorative fountains	no
f. Other, please name	no

2. Describe measures that prohibit water uses listed above:

The city established a No-Waste ordinance in 1990, which is actively enforced. Enforcement includes following up on gutter flooding complaints, educating customers on efficient practices, and if necessary, issue warnings and citations for violations. During the last drought, the city hired bike water cops to circulate throughout the service area and prevent and/or curtail gross water waste situations. Enforcement occurred when each customer had incurred three waste-of-water violations.

Water Softeners:

3. Indicate which of the following measures your agency has supported in developing state law:

a. Allow the sale of more efficient, demand-initiated regenerating DIR models.	yes
b. Develop minimum appliance efficiency standards that:	
i.) Increase the regeneration efficiency standard to at least 3,350 grains of hardness removed per pound of common salt used.	yes
ii.) Implement an identified maximum number of gallons discharged per gallon of soft water produced.	yes

c. Allow local agencies, including municipalities and special districts, to set more stringent standards and/or to ban on-site regeneration of water softeners if it is demonstrated and found by the agency governing board that there is an adverse effect on the reclaimed water or groundwater supply. yes

4. Does your agency include water softener checks in home water audit programs? no

5. Does your agency include information about DIR and exchange-type water softeners in educational efforts to encourage replacement of less efficient timer models? no

C. Water Waste Prohibition Program Expenditures

	This Year	Next Year
1. Budgeted Expenditures	0	0
2. Actual Expenditures	0	

D. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? no

a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

E. Comments

Though the City has the mechanics in place for issuing water waste ordinance citations, the notification process used, in addition to an existing general water consciousness among citizens, has made it so that no citations have been recorded to date.

BMP 14: Residential ULFT Replacement Programs

Reporting Unit: **City of Davis, Public Works** BMP Form Status: **100% Complete** Year: **2003**

A. Implementation

	Single-Family Accounts	Multi- Family Units
1. Does your Agency have program(s) for replacing high-water-using toilets with ultra-low flush toilets?	no	no

Number of Toilets Replaced by Agency Program During Report Year

Replacement Method	SF Accounts	MF Units
2. Rebate	0	0
3. Direct Install	0	0
4. CBO Distribution	0	0
5. Other	0	0
Total	0	0

6. Describe your agency's ULFT program for single-family residences.

The city had a toilet rebate program from 1992 to 2001. The initial toilet rebate effort in 1992 was a joint program with PG&E whereby customers received a rebate from both the city and PG&E totaling \$75. From 1993-99 the program evolved to a city only rebate for \$50. Over the last few years the rebate amount was increased to \$100 with the infusion of outside funding (Wildhorse Project). About 1,000 rebates were issued to Davis water customers during the program implementation period. Participants were primarily SFR customers. The rebate amount ranged from \$50-100 during the program duration. The rebates were issued to customers as a credit on their utility bill.

7. Describe your agency's ULFT program for multi-family residences.

None currently. Too much free-ridership

8. Is a toilet retrofit on resale ordinance in effect for your service area? no

9. List local jurisdictions in your service area in the left box and ordinance citations in each jurisdiction in the right box:

B. Residential ULFT Program Expenditures

	This Year	Next Year
1. Budgeted Expenditures	15000	15000
2. Actual Expenditures	0	

C. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? yes

a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

About 35 percent of the SFR inventory has been retrofitted with 1.6 gallon models through the residential rebate program and new construction requirements. As the city grows, the percentage of retrofitted accounts will grow accordingly. The City will not continue to

pursue this BMP due to increased evidence of free-ridership.

D. Comments

Reported as of 2/14/06

Water Supply & Reuse

Reporting Unit:

City of Davis, Public Works

Year:

2004**Water Supply Source Information****Supply Source Name****Quantity (AF) Supplied****Supply Type**

Sacramento Valley GW Basin

15096

Groundwater

Total AF: 15096

Reported as of 2/14/06

BMP 01: Water Survey Programs for Single-Family and Multi-Family Residential Customers

Reporting Unit: **City of Davis, Public Works** BMP Form Status: **100% Complete** Year: **2004**

A. Implementation

- | | |
|--|------------|
| 1. Based on your signed MOU date, 08/05/1994, your Agency STRATEGY DUE DATE is: | 08/04/1996 |
| 2. Has your agency developed and implemented a targeting/marketing strategy for SINGLE-FAMILY residential water use surveys? | yes |
| a. If YES, when was it implemented? | 01/01/1995 |
| 3. Has your agency developed and implemented a targeting/marketing strategy for MULTI-FAMILY residential water use surveys? | yes |
| a. If YES, when was it implemented? | 01/01/1995 |

B. Water Survey Data

Survey Counts:	Single Family Accounts	Multi-Family Units
1. Number of surveys offered:	14588	462
2. Number of surveys completed:	197	0

Indoor Survey:

- | | | |
|---|-----|-----|
| 3. Check for leaks, including toilets, faucets and meter checks | yes | yes |
| 4. Check showerhead flow rates, aerator flow rates, and offer to replace or recommend replacement, if necessary | yes | yes |
| 5. Check toilet flow rates and offer to install or recommend installation of displacement device or direct customer to ULFT replacement program, as necessary; replace leaking toilet flapper, as necessary | yes | yes |

Outdoor Survey:

- | | | |
|--|-----|----------------|
| 6. Check irrigation system and timers | yes | yes |
| 7. Review or develop customer irrigation schedule | yes | yes |
| 8. Measure landscaped area (Recommended but not required for surveys) | yes | yes |
| 9. Measure total irrigable area (Recommended but not required for surveys) | yes | yes |
| 10. Which measurement method is typically used (Recommended but not required for surveys) | | Measuring Tape |
| 11. Were customers provided with information packets that included evaluation results and water savings recommendations? | yes | yes |
| 12. Have the number of surveys offered and completed, survey results, and survey costs been tracked? | yes | yes |
| a. If yes, in what form are surveys tracked? | | database |
| b. Describe how your agency tracks this information. | | |

The City of Davis has a work order recording system.

C. Water Survey Program Expenditures

This Year Next Year

1. Budgeted Expenditures	25000	25000
2. Actual Expenditures	18850	

D. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? No

a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

E. Comments

Reported as of 2/14/06

BMP 02: Residential Plumbing Retrofit

Reporting Unit: **City of Davis, Public Works** BMP Form Status: **100% Complete** Year: **2004**

A. Implementation

1. Is there an enforceable ordinance in effect in your service area requiring replacement of high-flow showerheads and other water use fixtures with their low-flow counterparts? no
- a. If YES, list local jurisdictions in your service area and code or ordinance in each:
2. Has your agency satisfied the 75% saturation requirement for single-family housing units? no
3. Estimated percent of single-family households with low-flow showerheads: %
4. Has your agency satisfied the 75% saturation requirement for multi-family housing units? no
5. Estimated percent of multi-family households with low-flow showerheads: %
6. If YES to 2 OR 4 above, please describe how saturation was determined, including the dates and results of any survey research.

B. Low-Flow Device Distribution Information

1. Has your agency developed a targeting/ marketing strategy for distributing low-flow devices? no
- a. If YES, when did your agency begin implementing this strategy?
- b. Describe your targeting/ marketing strategy.

Low-Flow Devices Distributed/ Installed	SF Accounts	MF Units
2. Number of low-flow showerheads distributed:	0	0
3. Number of toilet-displacement devices distributed:	0	0
4. Number of toilet flappers distributed:	0	0
5. Number of faucet aerators distributed:	0	0
6. Does your agency track the distribution and cost of low-flow devices? no		
a. If YES, in what format are low-flow devices tracked?		
b. If yes, describe your tracking and distribution system :		

C. Low-Flow Device Distribution Expenditures

	This Year	Next Year
1. Budgeted Expenditures	0	0
2. Actual Expenditures	0	

D. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? No
- a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

E. Comments

The City provides leak dye tablets to its water customers as part of the water audit, leak check and customer assistance outreach service (see BMP 1). The City regularly publicizes its appliance rebate programs and availability of water conservation assistance. Showerheads and aerators are regulated by the National Energy Efficiency Standards, and are very affordable for customers to purchase and install independently. The city feels funding these activities would largely be a "free-rider" program since the market has been transformed and regulates the use of efficient showerheads and aerators in the marketplace.

Reported as of 2/14/06

BMP 03: System Water Audits, Leak Detection and Repair

Reporting Unit:

City of Davis, Public Works

BMP Form Status:

100% Complete

Year:

2004**A. Implementation**

1. Has your agency completed a pre-screening system audit for this reporting year? no
2. If YES, enter the values (AF/Year) used to calculate verifiable use as a percent of total production:
 - a. Determine metered sales (AF) 1279
 - b. Determine other system verifiable uses (AF) 323
 - c. Determine total supply into the system (AF) 1651
 - d. Using the numbers above, if (Metered Sales + Other Verifiable Uses) / Total Supply is < 0.9 then a full-scale system audit is required. 0.97
3. Does your agency keep necessary data on file to verify the values used to calculate verifiable uses as a percent of total production? yes
4. Did your agency complete a full-scale audit during this report year? no
5. Does your agency maintain in-house records of audit results or the completed AWWA audit worksheets for the completed audit? yes
6. Does your agency operate a system leak detection program? yes
 - a. If yes, describe the leak detection program:

The City operates their leak detection program on an "as-necessary" basis. When there's a leak, the City fixes it. Staff regularly reviews the water supply and demand data records and maintenance records, to confirm the unaccounted-for water losses system-side stay at or under 4 percent.

B. Survey Data

1. Total number of miles of distribution system line. 175.7
2. Number of miles of distribution system line surveyed. 0

C. System Audit / Leak Detection Program Expenditures**This Year Next Year**

1. Budgeted Expenditures
2. Actual Expenditures

D. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? yes
 - a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

The City operates their leak detection program on an "as-necessary" basis. When there's a leak, the City fixes it. Staff regularly reviews the water supply and demand data records and maintenance records, to confirm the unaccounted-for water losses system-side stay at or under 4 percent.

E. Comments

Reported as of 2/14/06

BMP 04: Metering with Commodity Rates for all New Connections and Retrofit of Existing

Reporting Unit: **City of Davis, Public Works** BMP Form Status: **100% Complete** Year: **2004**

A. Implementation

1. Does your agency require meters for all new connections and bill by volume-of-use? yes
2. Does your agency have a program for retrofitting existing unmetered connections and bill by volume-of-use? yes
 - a. If YES, when was the plan to retrofit and bill by volume-of-use existing unmetered connections completed? 01/01/1990
 - b. Describe the program:

The City is fully metered for all customer sectors. A meter retrofit project was implemented during the 1990-97 period. Separate meters were installed for SFR homes. A few retrofits for commercial, large landscapes, and institutional and governmental accounts were required to complete the project. Metered rates for all customer classes were adopted and effective for fy1998-99. All customer classes, except SFR, are on a two-tier inclining rate structure. SFR customers pay for water based on a single tier rate structure. All customers pay a base rate charge based on meter size.

3. Number of previously unmetered accounts fitted with meters during report year. 0

B. Feasibility Study

1. Has your agency conducted a feasibility study to assess the merits of a program to provide incentives to switch mixed-use accounts to dedicated landscape meters? no
 - a. If YES, when was the feasibility study conducted? (mm/dd/yy)
 - b. Describe the feasibility study:

2. Number of CII accounts with mixed-use meters. 0
3. Number of CII accounts with mixed-use meters retrofitted with dedicated irrigation meters during reporting period. 0

C. Meter Retrofit Program Expenditures

	This Year	Next Year
1. Budgeted Expenditures	0	0
2. Actual Expenditures	0	

D. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? yes
 - a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

This BMP is complete.

E. Comments

This BMP is complete.

Reported as of 2/14/06

BMP 05: Large Landscape Conservation Programs and Incentives

Reporting Unit:

City of Davis, Public Works

BMP Form Status:

100% Complete

Year:

2004

A. Water Use Budgets

- | | |
|--|-----|
| 1. Number of Dedicated Irrigation Meter Accounts: | 406 |
| 2. Number of Dedicated Irrigation Meter Accounts with Water Budgets: | 13 |
| 3. Budgeted Use for Irrigation Meter Accounts with Water Budgets (AF): | 1 |
| 4. Actual Use for Irrigation Meter Accounts with Water Budgets (AF): | 1 |
| 5. Does your agency provide water use notices to accounts with budgets each billing cycle? | yes |

B. Landscape Surveys

- | | |
|--|------------|
| 1. Has your agency developed a marketing / targeting strategy for landscape surveys? | yes |
| a. If YES, when did your agency begin implementing this strategy? | 01/01/1990 |
| b. Description of marketing / targeting strategy: | |
| There is mutual collaboration between Public Works and Parks Department. | |
| 2. Number of Surveys Offered. | 406 |
| 3. Number of Surveys Completed. | 7 |
| 4. Indicate which of the following Landscape Elements are part of your survey: | |
| a. Irrigation System Check | yes |
| b. Distribution Uniformity Analysis | yes |
| c. Review / Develop Irrigation Schedules | yes |
| d. Measure Landscape Area | yes |
| e. Measure Total Irrigable Area | yes |
| f. Provide Customer Report / Information | yes |
| 5. Do you track survey offers and results? | yes |
| 6. Does your agency provide follow-up surveys for previously completed surveys? | yes |
| a. If YES, describe below: | |

The Parks department re-audits areas.

C. Other BMP 5 Actions

- | | |
|--|-----|
| 1. An agency can provide mixed-use accounts with ETo-based landscape budgets in lieu of a large landscape survey program.
Does your agency provide mixed-use accounts with landscape budgets? | no |
| 2. Number of CII mixed-use accounts with landscape budgets. | 0 |
| 3. Do you offer landscape irrigation training? | yes |
| 4. Does your agency offer financial incentives to improve landscape water use efficiency? | no |

Type of Financial Incentive:

Budget (Dollars/

Number Awarded to Customers

Total Amount Awarded

	Year)		
a. Rebates	0	0	0
b. Loans	0	0	0
c. Grants	0	0	0

5. Do you provide landscape water use efficiency information to new customers and customers changing services? yes

a. If YES, describe below:

All new accounts must have a meter. All new Parks accounts are connected to the a central irrigation controller.

6. Do you have irrigated landscaping at your facilities? yes

a. If yes, is it water-efficient? yes

b. If yes, does it have dedicated irrigation metering? yes

7. Do you provide customer notices at the start of the irrigation season? yes

8. Do you provide customer notices at the end of the irrigation season? yes

D. Landscape Conservation Program Expenditures

	This Year	Next Year
1. Budgeted Expenditures	0	0
2. Actual Expenditures	0	

E. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? yes

a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

The City's primary irrigation meter accounts include its own Parks department, which manages its own budget. See comments below.

F. Comments

(1) The City has water budget accounts for its own parks. (2) The City assumes water budgets apply to accounts that are effectively ET controlled via a central irrigation control station, such that budgeted use equals actual use. (3) It is assumed accounts with water budgets use approximately 15% less water than non-budgeted accounts. Therefore, irrigation meter accounts with water budgets use approximately is 85% of the proportion of budgeted irrigation meter accounts to total irrigation meter accounts.

Reported as of 2/14/06

BMP 06: High-Efficiency Washing Machine Rebate Programs

Reporting Unit: **City of Davis, Public Works** BMP Form Status: **100% Complete** Year: **2004**

A. Implementation

1. Do any energy service providers or waste water utilities in your service area offer rebates for high-efficiency washers? no
 - a. If YES, describe the offerings and incentives as well as who the energy/waste water utility provider is.
2. Does your agency offer rebates for high-efficiency washers? yes
3. What is the level of the rebate? 125
4. Number of rebates awarded. 349

B. Rebate Program Expenditures

	This Year	Next Year
1. Budgeted Expenditures	54000	54000
2. Actual Expenditures	56335	

C. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? no
 - a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

D. Comments

(1) Rebates amounts of both \$100 and \$150 are offered. (2) The discrepancy between what the City budgets and actually pays is due to an expected DWR 75\$ match (as of 2002.)

Reported as of 2/14/06

BMP 07: Public Information Programs

Reporting Unit:

City of Davis, Public Works

BMP Form Status:

100% Complete

Year:

2004**A. Implementation**

1. Does your agency maintain an active public information program to promote and educate customers about water conservation? yes

a. If YES, describe the program and how it's organized.

The city promotes water conservation and other resource efficiencies in coordination with other city departments, local agencies and organizations (e.g. Chamber of Commerce). The city regularly provides conservation messages on the bi-monthly utility bill, distributes water related information to the community through community-wide newsletters and makes information available on the city's web site. The city's utility bill was redesigned to show gallons used per day for the last billing period compared to the same period the previous year (previously, the bill only indicated total billing period usage in billing units (one hundred cubic feet of water, which is 748 gallons). There is also a one-year water use history on the bill for water use tracking purposes by the customer.

2. Indicate which and how many of the following activities are included in your public information program.

Public Information Program Activity	Yes/No	Number of Events
a. Paid Advertising	no	
b. Public Service Announcement	no	
c. Bill Inserts / Newsletters / Brochures	yes	2
d. Bill showing water usage in comparison to previous year's usage	yes	
e. Demonstration Gardens	no	
f. Special Events, Media Events	no	
g. Speaker's Bureau	no	
h. Program to coordinate with other government agencies, industry and public interest groups and media	yes	

B. Conservation Information Program Expenditures

	This Year	Next Year
1. Budgeted Expenditures	20000	20000
2. Actual Expenditures	20000	

C. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? No

a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

D. Comments

BMP 08: School Education Programs

Reporting Unit: **City of Davis, Public Works** BMP Form Status: **100% Complete** Year: **2004**

A. Implementation

1. Has your agency implemented a school information program to promote water conservation? yes

2. Please provide information on your school programs (by grade level):

Grade	Are grade-appropriate materials distributed?	No. of class presentations	No. of students reached	No. of teachers' workshops
Grades K-3rd	no	0	0	0
Grades 4th-6th	no	0	0	0
Grades 7th-8th	no	0	0	0
High School	no	0	0	0

3. Did your Agency's materials meet state education framework requirements? yes

4. When did your Agency begin implementing this program? 01/01/1996

B. School Education Program Expenditures

	This Year	Next Year
1. Budgeted Expenditures	5000	5000
2. Actual Expenditures	0	

C. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? No

a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

D. Comments

In the past the City has provided lots of information to schools, but has received little interested feedback from teachers and administrators.

Reported as of 2/14/06

BMP 09: Conservation Programs for CII Accounts

Reporting Unit:

City of Davis, Public Works

BMP Form Status:

100% Complete

Year:

2004**A. Implementation**

1. Has your agency identified and ranked COMMERCIAL customers according to use? no
2. Has your agency identified and ranked INDUSTRIAL customers according to use? no
3. Has your agency identified and ranked INSTITUTIONAL customers according to use? no

Option A: CII Water Use Survey and Customer Incentives Program

4. Is your agency operating a CII water use survey and customer incentives program for the purpose of complying with BMP 9 under this option? no

CII Surveys	Commercial Accounts	Industrial Accounts	Institutional Accounts
a. Number of New Surveys Offered	563	0	266
b. Number of New Surveys Completed	0	0	0
c. Number of Site Follow-ups of Previous Surveys (within 1 yr)	0	0	0
d. Number of Phone Follow-ups of Previous Surveys (within 1 yr)	0	0	0
CII Survey Components	Commercial Accounts	Industrial Accounts	Institutional Accounts
e. Site Visit	yes	no	no
f. Evaluation of all water-using apparatus and processes	no	no	no
g. Customer report identifying recommended efficiency measures, paybacks and agency incentives	no	no	no
Agency CII Customer Incentives	Budget (\$/Year)	No. Awarded to Customers	Total \$ Amount Awarded
h. Rebates	10000	6	2700
i. Loans	0	0	0
j. Grants	0	0	0
k. Others	0	0	0

Option B: CII Conservation Program Targets

5. Does your agency track CII program interventions and water savings for the purpose of complying with BMP 9 under this? yes

option?

- | | |
|---|------|
| 6. Does your agency document and maintain records on how savings were realized and the method of calculation for estimated savings? | yes |
| 7. Estimated annual savings (AF/yr) from site-verified actions taken by agency since 1991. | 0 |
| 8. Estimated annual savings (AF/yr) from non-site-verified actions taken by agency since 1991. | .064 |

B. Conservation Program Expenditures for CII Accounts

	This Year	Next Year
1. Budgeted Expenditures	10000	10000
2. Actual Expenditures	2700	

C. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? yes

a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

The city does not initiate audits or surveys to CII customers since many of the businesses in Davis are billed based on a two tier rate structure and many of the customers have relatively low water use. The City would provide an audit or survey for a CII customer upon request. Instead, the City participates in the LightWash high-efficiency washer rebate program. Furthermore, the City has no industrial accounts, and their institutional accounts consist primarily of unbilled City accounts.

D. Comments

This BMP is addressed with rebates for high-efficiency washing machines.

BMP 09a: CII ULFT Water Savings

Reporting Unit:

City of Davis, Public Works

BMP Form Status:
100% Complete

Year:
2004

1. Did your agency implement a CII ULFT replacement program in the reporting year? No
If No, please explain why on Line B.
10.

A. Targeting and Marketing

1. What basis does your agency use to target customers for participation in this program? Check all that apply.
- a. Describe which method you found to be the most effective overall, and which was the most effective per dollar expended.
2. How does your agency advertise this program?
Check all that apply.
- a. Describe which method you found to be the most effective overall, and which was the most effective per dollar expended.

B. Implementation

1. Does your agency keep and maintain customer participant information? (Read the Help information for a complete list of all the information for this BMP.) no
2. Would your agency be willing to share this information if the CUWCC did a study to evaluate the program on behalf of your agency? No
3. What is the total number of customer accounts participating in the program during the last year ? 0

CII Subsector	Number of Toilets Replaced					Type Not Specified
	Standard Gravity Tank	Air Assisted	Valve Floor Mount	Valve Wall Mount		
4.						
a. Offices	0	0	0	0	0	0
b. Retail / Wholesale	0	0	0	0	0	0
c. Hotels	0	0	0	0	0	0
d. Health	0	0	0	0	0	0
e. Industrial	0	0	0	0	0	0
f. Schools: K to 12	0	0	0	0	0	0
g. Eating	0	0	0	0	0	0
h. Govern-	0	0	0	0	0	0

ment					
i. Churches	0	0	0	0	0
j. Other	0	0	0	0	0

5. Program design.

6. Does your agency use outside services to implement this program? No

a. If yes, check all that apply.

7. Participant tracking and follow-up. No follow-up

8. Based on your program experience, please rank on a scale of 1 to 5, with 1 being the least frequent cause and 5 being the most frequent cause, the following reasons why customers refused to participate in the program.

- a. Disruption to business 4
- b. Inadequate payback 5
- c. Inadequate ULFT performance 2
- d. Lack of funding 3
- e. American's with Disabilities Act 0
- f. Permitting 1
- g. Other. Please describe in B. 9. 0

9. Please describe general program acceptance/resistance by customers, obstacles to implementation, and other issues affecting program implementation or effectiveness.

The city had offered the toilet rebate program to all users during the 1992-2001 period, but very few CII customers had taken advantage of this program.

10. Please provide a general assessment of the program for this reporting year. Did your program achieve its objectives? Were your targeting and marketing approaches effective? Were program costs in line with expectations and budgeting?

N/A

C. Conservation Program Expenditures for CII ULFT

1. CII ULFT Program: Annual Budget & Expenditure Data

	Budgeted	Actual Expenditure
a. Labor	0	0
b. Materials	0	0
c. Marketing & Advertising	0	0
d. Administration & Overhead	0	0
e. Outside Services	0	0
f. Total	0	0

2. CII ULFT Program: Annual Cost Sharing

a. Wholesale agency contribution	0
b. State agency contribution	0

c. Federal agency contribution	0
d. Other contribution	0
e. Total	0

D. Comments

The city had offered the toilet rebate program to all users during the 1992-2001 period, but very few CII customers had taken advantage of this program.

Reported as of 2/14/06

BMP 11: Conservation Pricing

Reporting Unit:
City of Davis, Public Works

BMP Form
 Status:
100% Complete

Year:
2004

A. Implementation**Rate Structure Data Volumetric Rates for Water Service by Customer Class****1. Residential**

a. Water Rate Structure	Increasing Block
b. Sewer Rate Structure	Non-volumetric Flat Rate
c. Total Revenue from Volumetric Rates	\$3676581
d. Total Revenue from Non-Volumetric Charges, Fees and other Revenue Sources	\$1522413

2. Commercial

a. Water Rate Structure	Increasing Block
b. Sewer Rate Structure	Uniform
c. Total Revenue from Volumetric Rates	\$589389
d. Total Revenue from Non-Volumetric Charges, Fees and other Revenue Sources	\$117843

3. Industrial

a. Water Rate Structure	Service Not Provided
b. Sewer Rate Structure	Service Not Provided
c. Total Revenue from Volumetric Rates	\$0
d. Total Revenue from Non-Volumetric Charges, Fees and other Revenue Sources	\$0

4. Institutional / Government

a. Water Rate Structure	Uniform
b. Sewer Rate Structure	Uniform
c. Total Revenue from Volumetric Rates	\$0
d. Total Revenue from Non-Volumetric Charges, Fees and other Revenue Sources	\$0

5. Irrigation

a. Water Rate Structure	Increasing Block
b. Sewer Rate Structure	Uniform
c. Total Revenue from Volumetric Rates	\$120382
d. Total Revenue from Non-Volumetric Charges, Fees and other Revenue Sources	\$67601

6. Other

a. Water Rate Structure	Service Not Provided
b. Sewer Rate Structure	Service Not Provided
c. Total Revenue from Volumetric	

Rates \$0

d. Total Revenue from Non-Volumetric
Charges, Fees and other Revenue \$0
Sources

B. Conservation Pricing Program Expenditures

	This Year	Next Year
1. Budgeted Expenditures	0	25000
2. Actual Expenditures	0	

C. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? No

a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

The City contracts a rate study approximately every three years to analyze the effectiveness of its rate structure, and evaluate additional system considerations, while developing a new rate scheme. These analyses do include calculating the componenets requested above, however, accomplish the same goal.

D. Comments

Based on the City's billing system, the residential category includes both single family and multi-family users. The city also provides "city" (institutional/ government) service, but does not charge itself for use, so there is no revenue generated.

Reported as of 2/14/06

BMP 12: Conservation Coordinator

Reporting Unit: **City of Davis, Public Works** BMP Form Status: **100% Complete** Year: **2004**

A. Implementation

1. Does your Agency have a conservation coordinator? yes
2. Is this a full-time position? no
3. If no, is the coordinator supplied by another agency with which you cooperate in a regional conservation program ? no
4. Partner agency's name: N/A
5. If your agency supplies the conservation coordinator:
 - a. What percent is this conservation coordinator's position? 30%
 - b. Coordinator's Name Jacques DebBra
 - c. Coordinator's Title Senior Utility Resource Specialist
 - d. Coordinator's Experience and Number of Years Utility and demand management, +15 years
 - e. Date Coordinator's position was created (mm/dd/yyyy) 01/01/1990
6. Number of conservation staff, including Conservation Coordinator. 3

B. Conservation Staff Program Expenditures

	This Year	Next Year
1. Budgeted Expenditures	83833	85000
2. Actual Expenditures	83833	

C. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? no
 - a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

D. Comments

Reported as of 2/14/06

BMP 13: Water Waste Prohibition

Reporting Unit: **City of Davis, Public Works** BMP Form Status: **100% Complete** Year: **2004**

A. Requirements for Documenting BMP Implementation

1. Is a water waste prohibition ordinance in effect in your service area? yes

a. If YES, describe the ordinance:

No person shall use or cause to be used any city water for the purpose of sprinkling streets or alleys, except such person as may be authorized by the director of public works, nor allow any water to run to waste in any gutter or otherwise, nor shall any city water be used for irrigation except as provided in this chapter. No person other than employees of the water department shall open any fire hydrant or attach any hose thereto for any purpose, without first obtaining written permission from the chief of the fire department or the director of public works. (Code 1964, *8-2.404.)

2. Is a copy of the most current ordinance(s) on file with CUWCC? yes

a. List local jurisdictions in your service area in the first text box and water waste ordinance citations in each jurisdiction in the second text box:

Willowbank, El Macero, City of See B.2 below
Davis

B. Implementation

1. Indicate which of the water uses listed below are prohibited by your agency or service area.

- | | |
|--|-----|
| a. Gutter flooding | yes |
| b. Single-pass cooling systems for new connections | no |
| c. Non-recirculating systems in all new conveyor or car wash systems | no |
| d. Non-recirculating systems in all new commercial laundry systems | no |
| e. Non-recirculating systems in all new decorative fountains | no |
| f. Other, please name | no |

2. Describe measures that prohibit water uses listed above:

The city established a No-Waste ordinance in 1990, which is actively enforced. Enforcement includes following up on gutter flooding complaints, educating customers on efficient practices, and if necessary, issue warnings and citations for violations. During the last drought, the city hired bike water cops to circulate throughout the service area and prevent and/or curtail gross water waste situations. Enforcement occurred when each customer had incurred three waste-of-water violations.

Water Softeners:

3. Indicate which of the following measures your agency has supported in developing state law:

- | | |
|---|-----|
| a. Allow the sale of more efficient, demand-initiated regenerating DIR models. | yes |
| b. Develop minimum appliance efficiency standards that: | |
| i.) Increase the regeneration efficiency standard to at least 3,350 grains of hardness removed per pound of common salt used. | yes |
| ii.) Implement an identified maximum number of gallons discharged per gallon of soft water produced. | yes |

c. Allow local agencies, including municipalities and special districts, to set more stringent standards and/or to ban on-site regeneration of water softeners if it is demonstrated and found by the agency governing board that there is an adverse effect on the reclaimed water or groundwater supply. yes

4. Does your agency include water softener checks in home water audit programs? no

5. Does your agency include information about DIR and exchange-type water softeners in educational efforts to encourage replacement of less efficient timer models? no

C. Water Waste Prohibition Program Expenditures

	This Year	Next Year
1. Budgeted Expenditures	0	0
2. Actual Expenditures	0	

D. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? no

a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

E. Comments

Though the City has the mechanics in place for issuing water waste ordinance citations, the notification process used, in addition to an existing general water conciousness among citizens, has made it so that no citations have been recorded to date.

BMP 14: Residential ULFT Replacement Programs

Reporting Unit: **City of Davis, Public Works** BMP Form Status: **100% Complete** Year: **2004**

A. Implementation

	Single-Family Accounts	Multi- Family Units
1. Does your Agency have program(s) for replacing high-water-using toilets with ultra-low flush toilets?	no	no

Number of Toilets Replaced by Agency Program During Report Year

Replacement Method	SF Accounts	MF Units
2. Rebate	0	0
3. Direct Install	0	0
4. CBO Distribution	0	0
5. Other	0	0
Total	0	0

6. Describe your agency's ULFT program for single-family residences.

The city had a toilet rebate program from 1992 to 2001. The initial toilet rebate effort in 1992 was a joint program with PG&E whereby customers received a rebate from both the city and PG&E totaling \$75. From 1993-99 the program evolved to a city only rebate for \$50. Over the last few years the rebate amount was increased to \$100 with the infusion of outside funding (Wildhorse Project). About 1,000 rebates were issued to Davis water customers during the program implementation period. Participants were primarily SFR customers. The rebate amount ranged from \$50-100 during the program duration. The rebates were issued to customers as a credit on their utility bill.

7. Describe your agency's ULFT program for multi-family residences.

None currently. Too much free-ridership

8. Is a toilet retrofit on resale ordinance in effect for your service area? no

9. List local jurisdictions in your service area in the left box and ordinance citations in each jurisdiction in the right box:

B. Residential ULFT Program Expenditures

	This Year	Next Year
1. Budgeted Expenditures	15000	15000
2. Actual Expenditures	0	

C. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? yes

a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

About 35 percent of the SFR inventory has been retrofitted with 1.6 gallon models through the residential rebate program and new construction requirements. As the city grows, the percentage of retrofitted accounts will grow accordingly. The City will not continue to

pursue this BMP due to increased evidence of free-ridership.

D. Comments

APPENDIX E

Economic Analysis of Exempted BMPs

BMP 02 Simple Cost-Effectiveness Tool

Version 3, Beta

User Warning: This spreadsheet model is still under development. It is currently being tested by members of the R&E committee. This model has not been officially adopted by the CUWCC for benefit-cost analysis of BMP 02.

This spreadsheet tool provides a simple model for evaluating the cost-effectiveness of BMP 02. The model is organized into five data entry steps and one analysis review step, as follows:

Step 1 - Annual Costs: in this step you enter information to calculate the expected annual costs to implement BMP 02.

Step 2 - Customer Water Savings: in this step you enter information to calculate the expected water savings over time from implementation of BMP 02.

Step 3 - Agency Benefits: in this step you enter information to calculate the benefits to your agency from the water savings estimated in Step 2.

Step 4 - Other Benefits and Costs: in this step you enter information to calculate benefits and costs that may accrue to parties other than your agency from implementation of BMP 02.

Step 5 - Discounting Information: in this step you provide discount and cost escalation rates needed for the present value analysis.

Step 6 - Review Results: in this step you review the model results. These results are based on the information you provided in the first five steps.

Cell Color Key

Green Cells are cells that require data from the user.

White Cells are cells that contain formulas used by the model. If you overwrite the formulas in White Cells the model will cease to work properly. Only enter data in Green Cells.

Knowledge Requirements

This model calculates the present value benefits and costs associated with BMP 02. To use this model you should be familiar with the requirements of BMP 02 and basic methods of benefit-cost analysis and present value analysis. BMP 02 is fully described in Exhibit 1 of the MOU. Methods of benefit-cost analysis used by this model are described in the Council's "Guidelines for Preparing Cost-Effectiveness Analyses of Urban Water Conservation Best Management Practices." Both of these documents are available from the Council (www.cuwcc.org). Additionally, Appendix A of the Council's "BMP Costs & Savings Study" provides further review and examples of benefit-cost calculations.

The structure and organization of this model is based on similar worksheets provided in "Water Conservation Guidebook for Small and Medium-Sized Utilities," AWWA Pacific Northwest Section, 1993. This guidebook is available through the CUWCC lending library or may be purchased directly from AWWA.

Data Requirements

This model requires a variety of data, including:

- * Implementation costs, including staffing, materials, outside consultants, and marketing costs.
- * Estimates of water savings from residential plumbing retrofits, including initial savings and rates of decay.
- * Agency water production costs, including source of supply costs, capacity expansion costs, energy costs, and chemical costs.
- * Environmental benefits of water saved. In many instances users will not have this information. In these cases the model can be used to conduct "what-if" analysis to determine the effect of environmental benefits on BMP 02 cost-effectiveness.
- * Discount rates, both for your agency and for the society.

Much of the data required to implement this model is available in the Council's "BMP Costs & Savings Study." This document provides best available estimates of water savings and program costs for most of the BMPs for which water savings have been quantified.

Variable Units

Model variables represent specific quantities denoted in particular units. These units must be used or the model will provide incorrect results. The called for unit is always indicated for each variable for which you are providing a value. In most cases this will be obvious. Water volumes are mostly denoted in acre-feet (af). In some cases they are denoted in gallons-per-day (gpd). At the bottom of several worksheets a unit conversion calculator for converting water volume into acre-feet is provided.

Scenarios

You can save model scenarios. A scenario consists of all the values you entered for the model variables plus the benefit-cost results for those values. Scenarios are saved on the worksheet "Saved Scenarios." These scenarios can also be loaded back into the model at a later time using the "Load a saved scenario" button located

BMP 02 Residential Plumbing Retrofit - Annual Program Cost Worksheet*Instructions: Fill in all green cells.***Administration Costs**

1. Staff hours to administer the retrofit program 500 hrs/yr
2. Staff hourly rate, including overhead \$ 75.00 /hr
3. Administration costs (Line 1 x Line 2) \$ 37,500 /yr

Field Labor Costs

- | | Single Family
Plumbing Retrofits | Multi Family
Plumbing Retrofits |
|---|-------------------------------------|------------------------------------|
| 4. Field labor hours (e.g. kit distribution, direct installation) | <u>3,500</u> hrs/yr | <u>2,000</u> hrs/yr |
| 5. Field labor hourly rate, including overhead | \$ <u>35.00</u> /hr | \$ <u>35.00</u> /hr |
| 6. Field labor cost (Line 4 x Line 5) | \$ <u>122,500</u> /yr | \$ <u>70,000</u> /yr |

Materials Costs

- | | Single Family
Plumbing Retrofits | Multi Family
Plumbing Retrofits |
|---|-------------------------------------|------------------------------------|
| 7. Unit cost of materials (e.g., plumbing retrofit kits, nozzles, etc.) | \$ <u>2.00</u> /unit | \$ <u>2.00</u> /unit |
| 8. Number of kits distributed | <u>7,000</u> /yr | <u>4,000</u> /yr |
| 9. Total materials cost (Line 7 x Line 8) | \$ <u>14,000</u> /yr | \$ <u>8,000</u> /yr |

note:
CUWCC says, typical is \$2/kit

note:
distributed to approximately all accounts

Publicity Costs

10. Marketing collateral cost (e.g., brochure design, printing, web services) \$ 15,000 /yr
11. Advertising cost (i.e. newspaper, radio, TV, web) \$ 15,000 /yr
12. Total publicity costs (Line 10 + Line 11) \$ 30,000 /yr

Evaluation and Followup Costs

13. Labor & Consultant costs \$ 30,000 /yr

14. **Total Costs** (Line 3 + Line 6 + Line 9 + Line 12 + Line 13) \$ 312,000 /yr

Program Cost Sharing

15. Cost Share from Others (e.g., other agencies, grants, in-kind contrib.) \$ - /yr
16. **Net Agency Cost** (Line 14 - Line 15) \$ 312,000 /yr

BMP 02 Residential Plumbing Retrofit - Water Savings Worksheet

Instructions: Fill in all green cells.

	Single Family Plumbing Retrofits	Multi Family Plumbing Retrofits
1. Reduction in Avg. Use (gallons per day per residential unit)	6.14 gpd	6.14 gpd
2. Savings Decay	50 %/yr	50 %/yr
3. Number of Kits Distributed (from STEP 1 Line 8)	7,000	4,000
4. Percent of Kits Installed	45 %/yr	45 %/yr
5. Lifetime Savings	43.32 AF	24.76 AF

note:
assumes kits have showerheads (5.2-5.8 gpd savings) and leak tabs (.64 gpd overall)

BMP 02 Residential Plumbing Retrofit - Agency Benefits Worksheet

Instructions: Fill in all green cells that apply.

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

- 1. Marginal Source of Supply (List name) groundwater
 - 2. Avoidable Supply Acquisition Cost \$ 350 /AF
- note:
b/c gw only source in next 10 years

Avoided Water Treatment & Distribution Capacity Costs

- 3. Avoided capacity expansion costs (dollars per AF of water saved by conservation) \$ 0 /AF
- note:
Expansion policy states that new development is responsible for their own incremental capacity

Avoided Wastewater Capacity Costs (if service provided by agency)

- 4. Avoided capacity expansion costs (dollars per AF of water saved by conservation) \$ 0 /AF
- note:
Expansion policy states that new development is responsible for their own incremental capacity

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

Avoided water and wastewater treatment chemical costs

- 5. Total annual chemical costs \$ 23,000.00 /yr
 - 6. Annual fixed costs for chemicals \$ - /yr
 - 7. Annual chemical costs not related to water production \$ 2,944.00 /yr
 - 8. Avoidable chemical costs (Line 5 - Line 6 - Line 7) \$ 20,056.00 /yr
 - 9. Average annual treated water use 15,500 AF
 - 10. Unit Cost of Chemicals (Line 8 ÷ Line 9) \$ 1.29 /AF
- note:
N/A the City of Davis purchases chlorine on volume

N/A

note:
Source: 2005 UWMP

Avoided water and wastewater treatment energy costs

- 11. Annual energy costs \$ 107,000.00 /yr
- 12. Annual fixed costs \$ 10,700.00 /yr
- 13. Annual energy costs not related to water production (e.g., lighting, heating/cooling) \$ 30,000.00 /yr
- 14. Avoidable energy costs (Line 11 - Line 12 - Line 13) \$ 66,300.00 /yr
- 15. Average annual water use (from Line 9 above) 15,500.00 AF
- 16. Unit Cost of Energy (Line 14 ÷ Line 15) \$ 4.28 /AF
- 17. Avoided Treatment & Distribution Variab (Line 10 + Line 16) \$ 5.57 /AF
- 18. Total Supply & Wastewater Benefits (Line 2 + Line 3 + Line 4 + Line 17) \$ 355.57 /AF

Environmental Benefits

- 19. Environmental benefit per AF saved (e.g. value of instream flow, improved water quality, avoided environmental mitigation for supply development or wastewater disposal) \$ 0 /AF
- note:
Assume zero balance between minimized influent and increased wetland effluent concentration

BMP 02 Residential Plumbing Retrofit - Other Benefits and Costs Worksheet

Instructions: Fill in all green cells.

OTHER BENEFITS

Avoided Customer Energy Costs

	Single Family Plumbing Retrofits	Multi Family Plumbing Retrofits
1. Hot water use as a percent of total plumbing device water savings	25 %	35 %
2. Percent of residential hot water heated with gas (can get estimate from local utility or CEC)	45 %	60 %
3. Marginal cost per therm	\$ 1.25 /therm	
4. Marginal cost per kWh	\$ 0.12 /kWh	
5. Customer Energy Benefit	\$ 764.99 /AF	\$ 950.54 /AF

note:
source: PG&E call, 2 Dec 2005
note:
source: PG&E call, 2 Dec 2005
note:
source: PG&E call, 2 Dec 2005 -- \$1.70/therm winter, \$.80/therm summer
note:
source: PG&E call, 2 Dec 2005

note: Based on energy savings estimates listed in Table 6-3 of Water Conservation Guidebook for Small and Medium-Sized Utilities.

	therms/gal	kWh/gal
Showerheads	0.004414	0.104642
	70% effic.	98% effic.

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

6. Avoided energy & chemical costs \$ 358,542.40 /AF of conserved water

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

7. Avoided wastewater capacity expansion \$ 0 /AF of conserved water

OTHER COSTS

Customer participation costs

	Single Family Plumbing Retrofits	Multi Family Plumbing Retrofits
8. Average customer expenditures per kit installed (e.g., change landscaping, appliances, etc)	\$ 5 /kit	\$ 5 /kit
9. Number of kits distributed (from Line 8 of STEP 1)	7,000 /yr	4,000 /yr
10. Percent of Kits Installed (from Line 4 of STEP 2)	45 %/yr	45 %/yr
11. Total customer costs (Line 8 x Line 9 x Line 10)	\$ 15,750 /yr	\$ 9,000 /yr

BMP 02 Residential Plumbing Retrofit - Discounting Information

Instructions: Fill in all green cells.

Discount Rates (required)

- | | |
|-------------------------|--------------|
| 1. Agency Discount Rate | <u>1.5</u> % |
| 2. Social Discount Rate | <u>6.0</u> % |

Annual Escalation Rates (optional)

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

BMP 02 Residential Plumbing Retrofit - Summary of Costs & Benefits

<u>Program Present Value Costs</u>	<u>Agency Perspective</u>	<u>Society Perspective</u>
1. Total devices distributed	11,000	11,000
2. Total water savings	68.1 AF	68.1 AF
3. Agency program costs	\$312,000	\$312,000
4. Customer program costs	NA	\$24,750
5. Cost share	\$0	NA
6. Net Program Cost	<u>\$312,000</u>	<u>\$336,750</u>
<u>Program Present Value Benefits</u>		
7. Agency supply & wastewater benefits	\$23,854	\$22,910
8. Environmental benefits	\$0	\$0
9. Customer program benefits	NA	\$53,637
10. Other utility benefits	NA	\$23,101,513
11. Total benefits	<u>\$23,854</u>	<u>\$23,178,061</u>
12. Net Present Value (Line 11 - Line 6)	(\$288,146)	\$22,841,311
13. Benefit-Cost Ratio (Line 11 ÷ Line 6)	0.08	68.83
14. Simple Unit Supply Cost (Line 6 ÷ Line 2)	\$4,583 /AF	\$4,946 /AF
15. Discounted Unit Supply Cost (Line 6 ÷ discounted water savings)	\$4,651 /AF	\$5,226 /AF

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

This BMP is cost-effective to implement from the Society Perspective

Agency Perspective

Year	Water Savings			Undiscounted Agency Benefits			Discounted Agency Benefits			Discounted Supply AF
	Single Family AF	Multi Family AF	Total AF	Supply & Wastewater \$	Environmental \$	Total \$	Supply & Wastewater	Environmental	Total	
0	21.7	12.4	34.0	12,103	-	12,103	12,103	-	12,103	34.0
1	10.8	6.2	17.0	6,052	-	6,052	5,962	-	5,962	16.8
2	5.4	3.1	8.5	3,026	-	3,026	2,937	-	2,937	8.3
3	2.7	1.5	4.3	1,513	-	1,513	1,447	-	1,447	4.1
4	1.4	0.8	2.1	756	-	756	713	-	713	2.0
5	0.7	0.4	1.1	378	-	378	351	-	351	1.0
6	0.3	0.2	0.5	189	-	189	173	-	173	0.5
7	0.2	0.1	0.3	95	-	95	85	-	85	0.2
8	0.1	0.0	0.1	47	-	47	42	-	42	0.1
9	0.0	0.0	0.1	24	-	24	21	-	21	0.1
10	0.0	0.0	0.0	12	-	12	10	-	10	0.0
11	0.0	0.0	0.0	6	-	6	5	-	5	0.0
12	0.0	0.0	0.0	3	-	3	2	-	2	0.0
13	0.0	0.0	0.0	1	-	1	1	-	1	0.0
14	0.0	0.0	0.0	1	-	1	1	-	1	0.0
15	0.0	0.0	0.0	0	-	0	0	-	0	0.0
16	0.0	0.0	0.0	0	-	0	0	-	0	0.0
17	0.0	0.0	0.0	0	-	0	0	-	0	0.0
18	0.0	0.0	0.0	0	-	0	0	-	0	0.0
19	0.0	0.0	0.0	0	-	0	0	-	0	0.0
20	0.0	0.0	0.0	0	-	0	0	-	0	0.0
21	0.0	0.0	0.0	0	-	0	0	-	0	0.0
22	0.0	0.0	0.0	0	-	0	0	-	0	0.0
23	0.0	0.0	0.0	0	-	0	0	-	0	0.0
24	0.0	0.0	0.0	0	-	0	0	-	0	0.0
Total:	43.3	24.8	68.1	24,207	-	24,207	23,854	-	23,854	67.1

Society Perspective

Year	Water Savings			Undiscounted Program Benefits				Undiscounted Program Benefits				Discounted Supply AF
	Single Family AF	Multi Family AF	Total AF	Supply & Wastewater \$	Environmental \$	Customer Energy Benefits \$	Wastewater Utility Benefits \$	Supply & Wastewater	Environmental	Customer Energy Benefits	Wastewater Utility Benefits	
0	21.7	12.4	34.0	12,103	-	28,337	12,204,573	12,103	-	28,337	12,204,573	34.0
1	10.8	6.2	17.0	6,052	-	14,168	6,102,287	5,709	-	13,366	5,756,874	16.1
2	5.4	3.1	8.5	3,026	-	7,084	3,051,143	2,693	-	6,305	2,715,507	7.6
3	2.7	1.5	4.3	1,513	-	3,542	1,525,572	1,270	-	2,974	1,280,899	3.6
4	1.4	0.8	2.1	756	-	1,771	762,786	599	-	1,403	604,198	1.7
5	0.7	0.4	1.1	378	-	886	381,393	283	-	662	284,999	0.8
6	0.3	0.2	0.5	189	-	443	190,696	133	-	312	134,433	0.4
7	0.2	0.1	0.3	95	-	221	95,348	63	-	147	63,412	0.2
8	0.1	0.0	0.1	47	-	111	47,674	30	-	69	29,911	0.1
9	0.0	0.0	0.1	24	-	55	23,837	14	-	33	14,109	0.0
10	0.0	0.0	0.0	12	-	28	11,919	7	-	15	6,655	0.0
11	0.0	0.0	0.0	6	-	14	5,959	3	-	7	3,139	0.0
12	0.0	0.0	0.0	3	-	7	2,980	1	-	3	1,481	0.0
13	0.0	0.0	0.0	1	-	3	1,490	1	-	2	698	0.0
14	0.0	0.0	0.0	1	-	2	745	0	-	1	329	0.0
15	0.0	0.0	0.0	0	-	1	372	0	-	0	155	0.0
16	0.0	0.0	0.0	0	-	0	186	0	-	0	73	0.0
17	0.0	0.0	0.0	0	-	0	93	0	-	0	35	0.0
18	0.0	0.0	0.0	0	-	0	47	0	-	0	16	0.0
19	0.0	0.0	0.0	0	-	0	23	0	-	0	8	0.0
20	0.0	0.0	0.0	0	-	0	12	0	-	0	4	0.0
21	0.0	0.0	0.0	0	-	0	6	0	-	0	2	0.0
22	0.0	0.0	0.0	0	-	0	3	0	-	0	1	0.0
23	0.0	0.0	0.0	0	-	0	1	0	-	0	0	0.0
24	0.0	0.0	0.0	0	-	0	1	0	-	0	0	0.0
Total:	43.3	24.8	68.1	24,207	-	56,673	24,409,146	22,910	-	53,637	23,101,513	64.4

BMP 14 Simple Cost-Effectiveness Tool

Version 3, Beta

User Warning: This spreadsheet model is still under development. It is currently being tested by members of the R&E committee. This model has not been officially adopted by the CUWCC for benefit-cost analysis of BMP 14.

This spreadsheet tool provides a simple model for evaluating the cost-effectiveness of BMP 14. The model is organized into five data entry steps and one analysis review step, as follows:

Step 1 - Annual Costs: in this step you enter information to calculate the expected annual costs to implement BMP 14.

Step 2 - Customer Water Savings: in this step you enter information to calculate the expected water savings over time from implementation of BMP 14.

Step 3 - Agency Benefits: in this step you enter information to calculate the benefits to your agency from the water savings estimated in Step 2.

Step 4 - Other Benefits and Costs: in this step you enter information to calculate benefits and costs that may accrue to parties other than your agency from implementation of BMP 14.

Step 5 - Discounting Information: in this step you provide discount and cost escalation rates needed for the present value analysis.

Step 6 - Review Results: in this step you review the model results. These results are based on the information you provided in the first five steps.

Cell Color Key

Green Cells are cells that require data from the user.

White Cells are cells that contain formulas used by the model. If you overwrite the formulas in White Cells the model will cease to work properly. Only enter data in Green Cells.

Knowledge Requirements

This model calculates the present value benefits and costs associated with BMP 14. To use this model you should be familiar with the requirements of BMP 14 and basic methods of benefit-cost analysis and present value analysis. BMP 14 is fully described in Exhibit 1 of the MOU. Methods of benefit-cost analysis used by this model are described in the Council's "Guidelines for Preparing Cost-Effectiveness Analyses of Urban Water Conservation Best Management Practices." Both of these documents are available from the Council (www.cuwcc.org). Additionally, Appendix A of the Council's "BMP Costs & Savings Study" provides further review and examples of benefit-cost calculations.

The structure and organization of this model is based on similar worksheets provided in "Water Conservation Guidebook for Small and Medium-Sized Utilities," AWWA Pacific Northwest Section, 1993. This guidebook is available through the CUWCC lending library or may be purchased directly from AWWA.

Data Requirements

This model requires a variety of data, including:

- * Implementation costs, including staffing, materials, outside consultants, and marketing costs.
- * Estimates of water savings from residential toilet replacements including initial savings and rates of decay.
- * Agency water production costs, including source of supply costs, capacity expansion costs, energy costs, and chemical costs.
- * Environmental benefits of water saved. In many instances users will not have this information. In these cases the model can be used to conduct "what-if" analysis to determine the effect of environmental benefits on BMP 14 cost-effectiveness.
- * Discount rates, both for your agency and for the society.

Much of the data required to implement this model is available in the Council's "BMP Costs & Savings Study." This document provides best available estimates of water savings and program costs for most of the BMPs for which water savings have been quantified.

Variable Units

Model variables represent specific quantities denoted in particular units. These units must be used or the model will provide incorrect results. The called for unit is always indicated for each variable for which you are providing a value. In most cases this will be obvious. Water volumes are mostly denoted in acre-feet (af). In some cases they are denoted in gallons-per-day (gpd). At the bottom of several worksheets a unit conversion calculator for converting water volume into acre-feet is provided.

Scenarios

You can save model scenarios. A scenario consists of all the values you entered for the model variables plus the benefit-cost results for those values. Scenarios are saved on the worksheet "Saved Scenarios." These scenarios can also be loaded back into the model at a later time using the "Load a saved scenario" button located on the

BMP 14 ULFT Replacement Programs - Annual Program Cost Worksheet*Instructions: Fill in all green cells.***Administration Costs**

- | | |
|---|----------------------|
| 1. Staff hours to administer the rebate program | <u>200</u> hrs/yr |
| 2. Staff hourly rate, including overhead | \$ <u>75.00</u> /hr |
| 3. Administration costs
(Line 1 x Line 2) | \$ <u>15,000</u> /yr |

ULFT Costs

- | | Single-Family | Multi-Family |
|---|---------------------|---------------------|
| 4. ULFT Cost (or incentive cost) | \$ <u>100</u> /ULFT | \$ <u>100</u> /ULFT |
| 5. Number of ULFTs (or incentives) distributed | <u>50</u> /yr | <u>20</u> /yr |
| 6. Total ULFT replacement cost
(Line 4 x Line 5) | \$ <u>5,000</u> /yr | \$ <u>2,000</u> /yr |

Incentive Processing Costs

- | | |
|---|----------------------|
| 7. Average rebate processing cost (if not included in Admin. Costs) | \$ <u>250</u> /ULFT |
| 8. Total rebate processing cost
(Line 5 x Line 7) | \$ <u>17,500</u> /yr |

Publicity Costs

- | | |
|---|---------------------|
| 9. Marketing collateral cost
(e.g., brochure design, printing, web services) | \$ <u>1,500</u> /yr |
| 10. Advertising cost
(i.e. newspaper, radio, TV, web) | \$ <u>4,000</u> /yr |
| 11. Total publicity costs
(Line 9 + Line 10) | \$ <u>5,500</u> /yr |

Evaluation and Followup Costs

- | | |
|--|-----------------------------|
| 12. Labor & Consultant costs | \$ <u>5,000</u> /yr |
| 13. Total Costs
(Line 3 + Line 6 + Line 8 + Line 11 + Line 12) | \$ <u><u>50,000</u></u> /yr |

Program Cost Sharing

- | | |
|--|-----------------------------|
| 14. Cost Share from Others
(e.g., other agencies, grants, in-kind contrib.) | \$ <u>-</u> /yr |
| 15. Net Agency Cost
(Line 13 - Line 14) | \$ <u><u>50,000</u></u> /yr |

BMP 14 ULFT Replacement Programs - Water Savings Worksheet

Instructions: Fill in all green cells.

	Single-Family	Multi-Family	
1. Avg. Persons Per Household	<u>2.6</u>	<u>2.4</u>	note: Source: 2000 Census <input checked="" type="radio"/> Use CUWCC Reliable Savings Estimate <input type="radio"/> Use Own Estimate
2. Avg. Savings per ULFT (gallons per day per ULFT)	<u>21.7</u> gpd	<u>42.7</u> gpd	
3. Toilet Natural Replacement Rate	<u>4.0</u> %/yr	<u>4.0</u> %/yr	
4. Number of ULFTs Distributed (from STEP 1 Line 5)	<u>50</u>	<u>50</u>	
5. Percent Free-riders	<u>90</u> %	<u>90</u> %	note: Historic evidence exhibits very high free-ridership with less a lower rabte response rate than natural toilet
6. 25-Year Savings	<u>1.9</u> AF	<u>1.5</u> AF	

BMP 14 ULFT Replacement Programs - Agency Benefits Worksheet

Instructions: Fill in all green cells that apply.

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

1. Marginal Source of Supply (List name)	<u>Groundwater</u>
2. Avoidable Supply Acquisition Cost	\$ <u>350</u> /AF

note:
b/c gw only source in next 10 years

Avoided Treatment & Distribution Capacity Costs

3. Avoided capacity expansion costs (dollars per AF of water saved by conservation)	\$ <u>0</u> /AF
--	-----------------

note:
Expansion policy states that new development is responsible for their own incremental capacity

Avoided Wastewater Capacity Costs (if service provided by agency)

4. Avoided capacity expansion costs (dollars per AF of water saved by conservation)	\$ <u>0</u> /AF
--	-----------------

note:
Expansion policy states that new development is responsible for their own incremental capacity

Avoided Treatment & Distribution Variable Costs (include wastewater services if provided by agency)*Avoided chemical costs*

5. Total annual chemical costs	\$ <u>23,000.00</u> /yr
6. Annual fixed costs for chemicals	\$ <u>-</u> /yr
7. Annual chemical costs not related to water production	\$ <u>2,944.00</u> /yr
8. Avoidable chemical costs (Line 5 - Line 6 - Line 7)	\$ <u>20,056.00</u> /yr
9. Average annual treated water use	<u>15,500</u> AF
10. Unit Cost of Chemicals (Line 8 ÷ Line 9)	\$ <u>1.29</u> /AF

note:
N/A the City of Davis purchases chlorine on volume

N/A

note:
Source: 2005 UWMP

Avoided energy costs

11. Annual energy costs	\$ <u>1,007,000.00</u> /yr
12. Annual fixed costs	\$ <u>100,700.00</u> /yr
13. Annual energy costs not related to water production (e.g., lighting, heating/cooling)	\$ <u>30,000.00</u> /yr
14. Avoidable energy costs (Line 11 - Line 12 - Line 13)	\$ <u>876,300.00</u> /yr
15. Average annual water use (from Line 9 above)	<u>15,500.00</u> AF
16. Unit Cost of Energy (Line 14 ÷ Line 15)	\$ <u>56.54</u> /AF
17. Avoided Treatment & Distribution Variable (Line 10 + Line 16)	\$ <u>57.83</u> /AF
18. Total Supply & Wastewater Benefits (Line 2 + Line 3 + Line 4 + Line 17)	\$ <u>407.83</u> /AF

Environmental Benefits

19. Environmental benefit per AF saved (e.g. value of instream flow, improved water quality, avoided environmental mitigation for supply development or wastewater disposal)	\$ <u>0</u> /AF
--	-----------------

note:
Assume zero balance between minimized influent and increased wetland effluent concentration

BMP 14 ULFT Replacement Programs - Other Benefits and Costs Worksheet

Instructions: Fill in all green cells.

OTHER BENEFITS

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

1. Avoided energy & chemical costs	\$ <u>358,542.40</u> /AF of conserved water
2. Avoided wastewater capacity expansion	\$ <u>0</u> /AF of conserved water
3. Total avoided wastewater utility costs (Line 6 + Line 7)	\$ <u>358,542.40</u> /AF of conserved water

OTHER COSTS

Customer Participation Costs

	Single Family ULFTs	Multi Family ULFTs
4. Average customer expenditures per ULFT (e.g., installation, disposal of old toilet)	\$ <u>125</u> /ULFT	\$ <u>110</u> /ULFT
5. Number of ULFTs distributed (from Line 5 of STEP 1)	<u>50</u>	<u>20</u>
6. Percent of Freeriders (from Line 5 of STEP 2)	<u>90</u> %	<u>90</u> %
7. Total customer costs (Line 4 x Line 5 x (1 - Line 6))	\$ <u>625.00</u>	\$ <u>220.00</u>

BMP 14 ULFT Replacement Programs - Discounting Information

Instructions: Fill in all green cells.

Discount Rates (required)

- | | |
|-------------------------|--------------|
| 1. Agency Discount Rate | <u>1.5</u> % |
| 2. Social Discount Rate | <u>6.0</u> % |

Annual Escalation Rates (optional)

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

BMP 14 ULFT Replacement Programs - Summary of Costs & Benefits

<u>Program Present Value Costs</u>	<u>Agency Perspective</u>	<u>Society Perspective</u>
1. Total ULFTs distributed	70	70
2. Total water savings	3.5 AF	3.5 AF
3. Agency program costs	\$50,000	\$50,000
4. Customer program costs	NA	\$845
5. Cost share	\$0	NA
6. Net Program Cost	<u>\$50,000</u>	<u>\$50,845</u>
<u>Program Present Value Benefits</u>		
7. Agency supply & wastewater benefits	\$1,209	\$810
8. Environmental benefits	\$0	\$0
9. Other utility benefits	NA	\$712,252
10. Total benefits	<u>\$1,209</u>	<u>\$713,062</u>
11. Net Present Value (Line 10 - Line 6)	(\$48,791)	\$662,217
12. Benefit-Cost Ratio (Line 10 ÷ Line 6)	0.02	14.02
13. Simple Unit Supply Cost (Line 6 ÷ Line 2)	\$14,419 /AF	\$14,663 /AF
14. Discounted Unit Supply Cost (Line 6 ÷ discounted water savings)	\$16,872 /AF	\$25,595 /AF
<p><i>This BMP is not cost-effective to implement from the Agency Perspective</i> <i>This BMP is cost-effective to implement from the Society Perspective</i></p>		

Present Value Benefits - Agency Perspective

Year	Water Savings			Undiscounted Agency Benefits			Discounted Agency Benefits			Discounted Supply AF
	Single Family AF	Multi Family AF	Total Water Savings AF	Supply & Wastewater \$	Environmental \$	Total \$	Supply & Wastewater \$	Environmental \$	Total \$	
0										
1	0.1	0.1	0.2	88	-	88	87	-	87	0.2
2	0.1	0.1	0.2	85	-	85	82	-	82	0.2
3	0.1	0.1	0.2	82	-	82	78	-	78	0.2
4	0.1	0.1	0.2	78	-	78	74	-	74	0.2
5	0.1	0.1	0.2	75	-	75	70	-	70	0.2
6	0.1	0.1	0.2	72	-	72	66	-	66	0.2
7	0.1	0.1	0.2	69	-	69	62	-	62	0.2
8	0.1	0.1	0.2	66	-	66	59	-	59	0.1
9	0.1	0.1	0.2	64	-	64	56	-	56	0.1
10	0.1	0.1	0.2	61	-	61	53	-	53	0.1
11	0.1	0.1	0.1	59	-	59	50	-	50	0.1
12	0.1	0.1	0.1	56	-	56	47	-	47	0.1
13	0.1	0.1	0.1	54	-	54	45	-	45	0.1
14	0.1	0.1	0.1	52	-	52	42	-	42	0.1
15	0.1	0.1	0.1	50	-	50	40	-	40	0.1
16	0.1	0.1	0.1	48	-	48	38	-	38	0.1
17	0.1	0.0	0.1	46	-	46	36	-	36	0.1
18	0.1	0.0	0.1	44	-	44	34	-	34	0.1
19	0.1	0.0	0.1	42	-	42	32	-	32	0.1
20	0.1	0.0	0.1	41	-	41	30	-	30	0.1
21	0.1	0.0	0.1	39	-	39	29	-	29	0.1
22	0.1	0.0	0.1	38	-	38	27	-	27	0.1
23	0.0	0.0	0.1	36	-	36	26	-	26	0.1
24	0.0	0.0	0.1	35	-	35	24	-	24	0.1
25	0.0	0.0	0.1	33	-	33	23	-	23	0.1
Total:	1.9	1.5	3.5	1,414	-	1,414	1,209	-	1,209	3.0

Present Value Benefits - Society Perspective

Year	Water Savings			Undiscounted Program Benefits				Discounted Program Benefits				Discounted Supply AF
	Single Family AF	Multi Family AF	Total Water Savings AF	Supply & Wastewater \$	Environmental \$	Wastewater Utility Benefits \$	Total \$	Supply & Wastewater \$	Environmental \$	Wastewater Utility Benefits \$	Total \$	
0												
1	0.1	0.1	0.2	88	-	77,754	77,843	83	-	73,353	73,437	0.2
2	0.1	0.1	0.2	85	-	74,644	74,729	76	-	66,433	66,509	0.2
3	0.1	0.1	0.2	82	-	71,658	71,740	68	-	60,166	60,234	0.2
4	0.1	0.1	0.2	78	-	68,792	68,870	62	-	54,490	54,552	0.2
5	0.1	0.1	0.2	75	-	66,040	66,116	56	-	49,349	49,405	0.1
6	0.1	0.1	0.2	72	-	63,399	63,471	51	-	44,694	44,744	0.1
7	0.1	0.1	0.2	69	-	60,863	60,932	46	-	40,477	40,523	0.1
8	0.1	0.1	0.2	66	-	58,428	58,495	42	-	36,659	36,700	0.1
9	0.1	0.1	0.2	64	-	56,091	56,155	38	-	33,200	33,238	0.1
10	0.1	0.1	0.2	61	-	53,848	53,909	34	-	30,068	30,102	0.1
11	0.1	0.1	0.1	59	-	51,694	51,752	31	-	27,232	27,263	0.1
12	0.1	0.1	0.1	56	-	49,626	49,682	28	-	24,663	24,691	0.1
13	0.1	0.1	0.1	54	-	47,641	47,695	25	-	22,336	22,361	0.1
14	0.1	0.1	0.1	52	-	45,735	45,787	23	-	20,229	20,252	0.1
15	0.1	0.1	0.1	50	-	43,906	43,956	21	-	18,320	18,341	0.1
16	0.1	0.1	0.1	48	-	42,150	42,198	19	-	16,592	16,611	0.0
17	0.1	0.0	0.1	46	-	40,464	40,510	17	-	15,027	15,044	0.0
18	0.1	0.0	0.1	44	-	38,845	38,889	15	-	13,609	13,625	0.0
19	0.1	0.0	0.1	42	-	37,291	37,334	14	-	12,325	12,339	0.0
20	0.1	0.0	0.1	41	-	35,800	35,840	13	-	11,162	11,175	0.0
21	0.1	0.0	0.1	39	-	34,368	34,407	11	-	10,109	10,121	0.0
22	0.1	0.0	0.1	38	-	32,993	33,030	10	-	9,156	9,166	0.0
23	0.0	0.0	0.1	36	-	31,673	31,709	9	-	8,292	8,301	0.0
24	0.0	0.0	0.1	35	-	30,406	30,441	9	-	7,510	7,518	0.0
25	0.0	0.0	0.1	33	-	29,190	29,223	8	-	6,801	6,809	0.0
Total:	1.9	1.5	3.5	1,414	-	1,243,299	1,244,713	810	-	712,252	713,062	2.0

APPENDIX F

Summary of 2006-2010 Water Conservation Efforts

City of Davis
Summary of 2006-2010 Water Conservation Efforts

Regional Clothes Washer Rebate Program

The City will continue participation in this regional program with other water agencies in the Bay Area. The program offers customers rebates for installing water and energy efficient clothes washers during the program period. Rebates are paid for with Prop. 50 DWR Water Use Efficiency Program grant funds. This program is expected to continue the program for two years, during FYs 2006-07 and 2007-08, or until agency rebate funds are expended. The program rebates will be issued through EGIA, the current rebate issuance entity.

Regional ET Controller Pilot Program

The City will participate in this regional program which intends to install and evaluate the merits of installing ET irrigation controllers that can be programmed to reflect local climate factors and result in more efficient outdoor water use patterns. Each participating agency will identify higher water using customers in both the SFR and commercial sectors to participate in the program who tend to have higher than typical irrigation usage patterns. Once the ET controllers are installed, water use will be evaluated to determine the effectiveness of the pilot effort. This program will be implemented during calendar years 2006 and 2007.

California SFR Water Use Efficiency Study

The City will participate in this state-wide study with a total of 10 water agencies. Each participating agency will have at least 60 randomly selected accounts and their indoor and outdoor household water use patterns derived from dataloggers. This will show the household use by end uses and the efficiency levels of the fixtures present in the home. Outdoor use will be characterized by the volume of water applied to the landscape compared to the theoretical requirements determined from the landscape analysis. Potential savings from use of the California Friendly Landscape Program will be estimated. Each agency will receive an individual report for its customers in the study. Statistical models will be prepared and a report generated for the project as a whole as described in the proposal document. This project is funded through both Prop. 50 Water Use Efficiency Program grant funds and participating agency contributions. This study will be conducted and completed in calendar years 2006 and 2007.

Pre-Rinse Spray Valve Program

The City will participate in this program through the CUWCC's regional effort. This will ensure a high participation rate in this successful restaurant conservation measure in the City of Davis service area. The program will be offered until high saturation of the restaurant sector is achieved.

Water System Leak Detection Survey

The City will conduct a water system leak detection survey once every five year period for each update of its UWMP. The survey will be conducted during the 2007-2009 period and will focus on older portions of the water system and/or locations within the water system believed to be a risk for leak losses.

Parks Water Budget Program

A water budget will be developed for the parks and open space areas maintained by the city for recreational benefits to its customers. First, historical water use will be evaluated to develop a water budget. Then efficiency improvements will be identified that could improve water budgets at those sites ailing from poor distribution uniformity and other conditions that may result in higher than normal water use patterns. Finally, a water budget will be identified and actual water use monitored and tracked on a seasonal basis. This program will be developed in the 2007/2008 time frame.

Landscape Water Conservation Ordinance Update

The City will update its Landscape Water Conservation Ordinance per recommendations from the California Urban Conservation Council (CUWCC) AB 2717 Landscape Task Force. This ordinance will be updated in the 2008/2009 time frame.

Drought Plan Update

The City's water shortage policies will be reviewed and updated in the 2008-2010 period.

APPENDIX G

Emergency Contingency Plan Table of Contents

City of Davis
Emergency Response Plan
For
Public Water System Davis/El Macero
PS # 5710001

June 2004



For more information contact:
City of Davis Public Works Department
1717 Fifth Street
Davis, CA 95616

(530) 757-5686
www.cityofdavis.org

City of Davis
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Emergency Response Plan
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APPENDIX H

DWR UWMP Checklist

2005 Urban Water Management Plan Checklist

City of Davis

Coordination with Appropriate Agencies		(Water Code § 10620 (d)(1)(2))	
<input checked="" type="checkbox"/>	Describe the coordination of the plan preparation and anticipated benefits.	1.4	Reference & Section Number
Describe resource maximization / import minimization plan		(Water Code §10620 (f))	
<input checked="" type="checkbox"/>	Describe how water management tools / options maximize resources & minimize need to import water	1.2	Reference & Section Number
Plan Updated in Years Ending in Five and Zero		(Water Code § 10621(a))	
<input checked="" type="checkbox"/>	Date updated and adopted plan received (enter date)	1.3	Reference & Section Number
City and County Notification and Participation		(Water Code § 10621(b))	
<input checked="" type="checkbox"/>	Notify any city or county within service area of UWMP of plan review & revision	1.3	Reference & Section Number
<input checked="" type="checkbox"/>	Consult and obtain comments from cities and counties within service area	1.3	Reference & Section Number
Service Area Information		Water Code § 10631 (a)	
<input checked="" type="checkbox"/>	Include current and projected population	3.1	Reference & Section Number
<input checked="" type="checkbox"/>	Population projections were based on data from state, regional or local agency	3.1	Reference & Section Number
<input checked="" type="checkbox"/>	Describe climate characteristics that affect water management	2.2	Reference & Section Number
<input checked="" type="checkbox"/>	Describe other demographic factors affecting water management	3.2	Reference & Section Number
Water Sources		(Water Code § 10631 (b))	
<input checked="" type="checkbox"/>	Identify existing and planned water supply sources	4.1	Reference & Section Number
<input checked="" type="checkbox"/>	Provide current water supply quantities	4.5	Reference & Section Number
<input checked="" type="checkbox"/>	Provide planned water supply quantities	4.5	Reference & Section Number
If Groundwater identified as existing or planned source		(Water Code §10631 (b)(1-4))	
<input type="checkbox"/>	Has management plan	N/A	Reference & Section Number
<input type="checkbox"/>	Attached management plan (b)(1)	N/A	Reference & Section Number
<input checked="" type="checkbox"/>	Description of basin(s) (b)(2)	4.2.2	Reference & Section Number
<input type="checkbox"/>	Basin is adjudicated	N/A	Reference & Section Number
<input type="checkbox"/>	If adjudicated, attached order or decree (b)(2)	N/A	Reference & Section Number
<input type="checkbox"/>	Quantified amount of legal pumping right (b)(2)	N/A	Reference & Section Number
<input type="checkbox"/>	DWR identified, or projected to be, in overdraft (b)(2)	N/A	Reference & Section Number
<input type="checkbox"/>	Plan to eliminate overdraft (b)(2)	N/A	Reference & Section Number
<input checked="" type="checkbox"/>	Analysis of location, amount & sufficiency, last five years (b)(3)	4.2	Reference & Section Number
<input checked="" type="checkbox"/>	Analysis of location & amount projected, 20 years (b)(4)	4.2	Reference & Section Number
Reliability of Supply		(Water Code §10631 (c) (1-3))	
<input checked="" type="checkbox"/>	Describes the reliability of the water supply and vulnerability to seasonal or climatic shortage	4.7	Reference & Section Number
Water Sources Not Available on a Consistent Basis		(Water Code §10631 (c))	
<input checked="" type="checkbox"/>	Describe the reliability of the water supply due to seasonal or climatic shortages	4.7.1	Reference & Section Number
<input checked="" type="checkbox"/>	Describe the vulnerability of the water supply to seasonal or climatic shortages	4.7.1	Reference & Section Number
<input type="checkbox"/>	No unreliable sources	N/A	Reference & Section Number
<input checked="" type="checkbox"/>	Describe plans to supplement or replace inconsistent sources with alternative sources or DMMs	4.7.1	Reference & Section Number
<input type="checkbox"/>	No inconsistent sources	N/A	Reference & Section Number
Transfer or Exchange Opportunities		(Water Code §10631 (d))	
<input checked="" type="checkbox"/>	Describe short term and long term exchange or transfer opportunities	4.3	Reference & Section Number
<input checked="" type="checkbox"/>	No transfer opportunities	4.3	Reference & Section Number
Water Use Provisions		(Water Code §10631 (e)(1)(2))	
<input checked="" type="checkbox"/>	Quantify past water use by sector	3.2	Reference & Section Number
<input checked="" type="checkbox"/>	Quantify current water use by sector	3.2	Reference & Section Number
<input checked="" type="checkbox"/>	Project future water use by sector	3.2	Reference & Section Number
<input checked="" type="checkbox"/>	Identify and quantify sales to other agencies	N/A	Reference & Section Number
<input checked="" type="checkbox"/>	No sales to other agencies	3.2.2	Reference & Section Number
<input checked="" type="checkbox"/>	Identify and quantify additional water uses	3.2.3	Reference & Section Number
Demand Management measures		(Water Code §10631 (f))	
The Checklist for the Demand Management Measures (Water Code §10631 (f) & (g), is found in last part of checklist.			
Planned Water Supply Projects, Programs and non-implemented DMMs		(Water Code §10631 (g))	
<input type="checkbox"/>	No future water supply projects or programs	N/A	Reference & Section Number
<input type="checkbox"/>	No non-implemented / not scheduled DMMs	N/A	Reference & Section Number
<input checked="" type="checkbox"/>	Cost-Benefit includes economic and non-economic factors	Chapter 6	Reference & Section Number
<input checked="" type="checkbox"/>	Cost-Benefit analysis includes total benefits and total costs	Chapter 6	Reference & Section Number
<input checked="" type="checkbox"/>	Identifies funding available for projects with higher per-unit-cost than DMMs	Chapter 6	Reference & Section Number
<input checked="" type="checkbox"/>	Identifies Suppliers' legal authority to implement DMMs	Chapter 6	Reference & Section Number
<input checked="" type="checkbox"/>	Identifies Suppliers' efforts to implement the measures	Chapter 6	Reference & Section Number

District is a CUWCC signatory (Water Code § 10631 (j))

Urban suppliers that are CUWCC members 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). The supplier's CUWCC Best Management Practices report should be attached to the UWMP.

- Agency is a CUWCC member
- 2003-04 annual updates are attached to plan
- Both annual updates are considered completed by CUWCC website

If Supplier receives or projects receiving water from a wholesale supplier (Water Code §10631 (k))

- | | | | |
|-------------------------------------|---|------------|----------------------------|
| <input checked="" type="checkbox"/> | Agency receives or projects receiving wholesale water | <u>3.3</u> | Reference & Section Number |
| <input checked="" type="checkbox"/> | Agency provided written demand projections to wholesaler, 20 years | <u>3.3</u> | Reference & Section Number |
| <input checked="" type="checkbox"/> | ALL wholesalers provided written water availability projections, by source, to agency, 20 years | <u>3.3</u> | Reference & Section Number |
| <input checked="" type="checkbox"/> | Reliability of wholesale supply provided in writing by ALL wholesale agencies | <u>N/A</u> | Reference & Section Number |

Water Shortage Contingency Plan Section (Water Code § 10632)**Stages of Action (Water Code § 10632 (a))**

- | | | | |
|-------------------------------------|--|--------------|----------------------------|
| <input checked="" type="checkbox"/> | Provide stages of action | <u>7.3.5</u> | Reference & Section Number |
| <input checked="" type="checkbox"/> | Provide the water supply conditions for each stage | <u>7.3.5</u> | Reference & Section Number |
| <input checked="" type="checkbox"/> | Includes plan for 50 percent supply shortage | <u>7.3.5</u> | Reference & Section Number |

Three-Year Minimum Water Supply (Water Code §10632 (b))

- | | | | |
|-------------------------------------|---|--------------|----------------------------|
| <input checked="" type="checkbox"/> | Identifies driest 3-year period | <u>7.3.6</u> | Reference & Section Number |
| <input checked="" type="checkbox"/> | Minimum water supply available by source for the next three years | <u>7.3.6</u> | Reference & Section Number |

Preparation for catastrophic water supply interruption (Water Code §10632 (c))

- | | | | |
|-------------------------------------|--|--------------|----------------------------|
| <input checked="" type="checkbox"/> | Provided catastrophic supply interruption plan | <u>7.3.7</u> | Reference & Section Number |
|-------------------------------------|--|--------------|----------------------------|

Prohibitions (Water Code § 10632 (d))

- | | | | |
|-------------------------------------|---|--------------|----------------------------|
| <input checked="" type="checkbox"/> | List the mandatory prohibitions against specific water use practices during water shortages | <u>7.3.8</u> | Reference & Section Number |
|-------------------------------------|---|--------------|----------------------------|

Consumption Reduction Methods (Water Code § 10632 (e))

- | | | | |
|-------------------------------------|---|--------------|----------------------------|
| <input checked="" type="checkbox"/> | List consumption reduction methods to reduce water use in the most restrictive stages with up to a 50% reduction. | <u>7.3.8</u> | Reference & Section Number |
|-------------------------------------|---|--------------|----------------------------|

Penalties (Water Code § 10632 (f))

- | | | | |
|-------------------------------------|---|--------------|----------------------------|
| <input checked="" type="checkbox"/> | List excessive use penalties or charges for excessive use | <u>7.3.8</u> | Reference & Section Number |
|-------------------------------------|---|--------------|----------------------------|

Revenue and Expenditure Impacts (Water Code § 10632 (g))

- | | | | |
|-------------------------------------|---|--------------|----------------------------|
| <input checked="" type="checkbox"/> | Describe how actions and conditions impact revenues | <u>7.3.9</u> | Reference & Section Number |
| <input checked="" type="checkbox"/> | Describe how actions and conditions impact expenditures | <u>7.3.9</u> | Reference & Section Number |
| <input checked="" type="checkbox"/> | Describe measures to overcome the revenue and expenditure impacts | <u>7.3.9</u> | Reference & Section Number |

Water Shortage Contingency Ordinance/Resolution (Water Code § 10632 (h))

- | | | | |
|-------------------------------------|--|-------------------|----------------------------|
| <input checked="" type="checkbox"/> | Attach a copy of the draft water shortage contingency resolution or ordinance. | <u>Appendix C</u> | Reference & Section Number |
|-------------------------------------|--|-------------------|----------------------------|

Reduction Measuring Mechanism (Water Code § 10632 (i))

- | | | | |
|-------------------------------------|---|---------------|----------------------------|
| <input checked="" type="checkbox"/> | Provided mechanisms for determining actual reductions | <u>7.3.10</u> | Reference & Section Number |
|-------------------------------------|---|---------------|----------------------------|

Recycling Plan Agency Coordination Water Code § 10633

- | | | | |
|-------------------------------------|---|------------|----------------------------|
| <input checked="" type="checkbox"/> | Describe the coordination of the recycling plan preparation information to the extent available.. | <u>5.1</u> | Reference & Section Number |
|-------------------------------------|---|------------|----------------------------|

Wastewater System Description (Water Code § 10633 (a))

- | | | | |
|-------------------------------------|---|--------------|----------------------------|
| <input checked="" type="checkbox"/> | Describe the wastewater collection and treatment systems in the supplier's service area | <u>5.2.1</u> | Reference & Section Number |
| <input checked="" type="checkbox"/> | Quantify the volume of wastewater collected and treated | <u>5.2.1</u> | Reference & Section Number |

Wastewater Disposal and Recycled Water Uses (Water Code § 10633 (a - d))

- | | | | |
|-------------------------------------|---|--------------|----------------------------|
| <input checked="" type="checkbox"/> | Describes methods of wastewater disposal | <u>5.2.4</u> | Reference & Section Number |
| <input checked="" type="checkbox"/> | Describe the current type, place and use of recycled water | <u>5.3</u> | Reference & Section Number |
| <input checked="" type="checkbox"/> | Describe and quantify potential uses of recycled water | <u>5.4.1</u> | Reference & Section Number |
| <input checked="" type="checkbox"/> | Determination of technical and economic feasibility of serving the potential uses | <u>5.4.1</u> | Reference & Section Number |
| <input checked="" type="checkbox"/> | No opportunities for recycled water. | <u>N/A</u> | Reference & Section Number |

Projected Uses of Recycled Water (Water Code § 10633 (e))

- | | | | |
|-------------------------------------|--|--------------|----------------------------|
| <input checked="" type="checkbox"/> | Projected use of recycled water, 20 years | <u>5.4.2</u> | Reference & Section Number |
| <input checked="" type="checkbox"/> | Compare UWMP 2000 projections with UWMP 2005 actual (10633(e)) | <u>5.4.2</u> | Reference & Section Number |

Plan to Optimize Use of Recycled Water (Water Code § 10633 (f))

- | | | | |
|-------------------------------------|---|--------------|----------------------------|
| <input checked="" type="checkbox"/> | Describe actions that might be taken to encourage recycled water uses | <u>5.5</u> | Reference & Section Number |
| <input checked="" type="checkbox"/> | Describe projected results of these actions in terms of acre-feet of recycled water used per year | <u>5.5.1</u> | Reference & Section Number |
| <input checked="" type="checkbox"/> | Provide a recycled water use optimization plan which includes actions to facilitate the use of recycled water | <u>5.5.2</u> | Reference & Section Number |

Water quality impacts on availability of supply (Water Code §10634)

- | | | | |
|-------------------------------------|---|--------------|----------------------------|
| <input checked="" type="checkbox"/> | Discusses water quality impacts (by source) upon water management strategies and supply reliability | <u>4.4</u> | Reference & Section Number |
| <input checked="" type="checkbox"/> | No water quality impacts projected | <u>4.4.1</u> | Reference & Section Number |

Supply and Demand Comparison to 20 Years (Water Code § 10635 (a))

- | | | | |
|-------------------------------------|---|--------------|----------------------------|
| <input checked="" type="checkbox"/> | Compare the projected normal water supply to projected normal water use over the next 20 years, in 5-year increments. | <u>7.1.2</u> | Reference & Section Number |
|-------------------------------------|---|--------------|----------------------------|

Supply and Demand Comparison: Single-dry Year Scenario (Water Code § 10635 (a))

Provision of Water Service Reliability section to cities/counties		(Water Code § 10635(b))	
<input checked="" type="checkbox"/>	Provided Water Service Reliability section of UWMP to cities and counties of UWMP submission to DWR	1.3	Reference & Section Number
Does the Plan Include Public Participation and Plan Adoption		(Water Code § 10642)	
<input checked="" type="checkbox"/>	Attach a copy of adoption resolution	Appendix B	Reference & Section Number
<input checked="" type="checkbox"/>	Encourage involvement of social, cultural & economic community groups	1.3	Reference & Section Number
<input checked="" type="checkbox"/>	Plan available for public inspection	1.3	Reference & Section Number
<input checked="" type="checkbox"/>	Provide proof of public hearing	Appendix A	Reference & Section Number
<input checked="" type="checkbox"/>	Provided meeting notice to local governments	Appendix A	Reference & Section Number
Review of implementation of 2000 UWMP		(Water Code § 10643)	
<input checked="" type="checkbox"/>	Reviewed implementation plan and schedule of 2000 UWMP	1.1	Reference & Section Number
<input checked="" type="checkbox"/>	Implemented in accordance with the schedule set forth in plan	1.1	Reference & Section Number
<input type="checkbox"/>	2000 UWMP not required	N/A	Reference & Section Number
Provision of 2005 UWMP to local governments		(Water Code § 10644 (a))	
<input checked="" type="checkbox"/>	Provide 2005 UWMP to DWR, and cities and counties within 30 days of adoption	1	Reference & Section Number
Proof plan is available for public review		(Water Code § 10645)	
<input checked="" type="checkbox"/>	Does UWMP or correspondence accompanying it show where it is available for public review	1	Reference & Section Number

2005 Urban Water Management Plan Checklist (DMMs)

Because the City is a CUWCC MOU signatory, the following section is not applicable. See Appendices D and E for relevant information.

DMM 1 -Water Survey Programs for Single-Family and Multi-Family Residential Customers (10631 f(1)(A))

Implementation	(Section 10631 (f) & (h))	
<input type="checkbox"/> Describe DMM currently being implemented or scheduled for implementation (10631 (f) (1)(2))	_____	Reference & Section Number
<input type="checkbox"/> Describes steps necessary to implement measure	_____	Reference & Section Number
<input type="checkbox"/> Describe the methods, if any, used to evaluate the effectiveness of this DMM (10631 (f)(3))	_____	Reference & Section Number
<input type="checkbox"/> Provide estimates, if available, of existing conservation savings on water use and the effect of such savings on the supplier's ability to further reduce demand (10631 (f)(4))	_____	Reference & Section Number

Provided an evaluation for this DMM if it is not implemented	(Section 10631 (g))	
<input type="checkbox"/> Evaluate legal authority (10631(g)(4))	_____	Reference & Section Number
<input type="checkbox"/> Evaluate economic and non-economic factors (10631(g)(1))	_____	Reference & Section Number
<input type="checkbox"/> Evaluate environmental, social, health factors (10631(g)(1))	_____	Reference & Section Number
<input type="checkbox"/> Evaluate customer impact & technological factors (10631(g)(1))	_____	Reference & Section Number
<input type="checkbox"/> Describe efforts to work with other relevant agencies to ensure implementation of the measure and to share the cost of implementation (10631 (g)(4))	_____	Reference & Section Number
<input type="checkbox"/> Describe funding available to implement any planned water supply project that would provide water at a higher unit cost (10631 (g)(3) & (h))	_____	Reference & Section Number

If Another Agency Implementing		
<input type="checkbox"/> If another Agency is implementing (10631 (g)(4))	_____	Reference & Section Number

DMM 2 - Residential Plumbing Retrofit (10631 f(1)(B))

Implementation	(Section 10631 (f) & (h))	
<input type="checkbox"/> Describe DMM currently being implemented or scheduled for implementation (10631 (f) (1)(2))	_____	Reference & Section Number
<input type="checkbox"/> Describes steps necessary to implement measure	_____	Reference & Section Number
<input type="checkbox"/> Describe the methods, if any, used to evaluate the effectiveness of this DMM (10631 (f)(3))	_____	Reference & Section Number
<input type="checkbox"/> Provide estimates, if available, of existing conservation savings on water use and the effect of such savings on the supplier's ability to further reduce demand (10631 (f)(4))	_____	Reference & Section Number

Provided an evaluation for this DMM if it is not implemented	(Section 10631 (g))	
<input type="checkbox"/> Evaluate legal authority (10631(g)(4))	_____	Reference & Section Number
<input type="checkbox"/> Evaluate economic and non-economic factors (10631(g)(1))	_____	Reference & Section Number
<input type="checkbox"/> Evaluate environmental, social, health factors (10631(g)(1))	_____	Reference & Section Number
<input type="checkbox"/> Evaluate customer impact & technological factors (10631(g)(1))	_____	Reference & Section Number
<input type="checkbox"/> Describe efforts to work with other relevant agencies to ensure implementation of the measure and to share the cost of implementation (10631 (g)(4))	_____	Reference & Section Number
<input type="checkbox"/> Describe funding available to implement any planned water supply project that would provide water at a higher unit cost (10631 (g)(3) & (h))	_____	Reference & Section Number

If Another Agency Implementing		
<input type="checkbox"/> If another Agency is implementing (10631 (g)(4))	_____	Reference & Section Number

DMM 3 - System Water Audits, Leak Detection and Repair (10631 f(1)(C))

Implementation	(Section 10631 (f) & (h))	
<input type="checkbox"/> Describe DMM currently being implemented or scheduled for implementation (10631 (f) (1)(2))	_____	Reference & Section Number
<input type="checkbox"/> Describes steps necessary to implement measure	_____	Reference & Section Number
<input type="checkbox"/> Describe the methods, if any, used to evaluate the effectiveness of this DMM (10631 (f)(3))	_____	Reference & Section Number
<input type="checkbox"/> Provide estimates, if available, of existing conservation savings on water use and the effect of such savings on the supplier's ability to further reduce demand (10631 (f)(4))	_____	Reference & Section Number

Provided an evaluation for this DMM if it is not implemented	(Section 10631 (g))	
<input type="checkbox"/> Evaluate legal authority (10631(g)(4))	_____	Reference & Section Number
<input type="checkbox"/> Evaluate economic and non-economic factors (10631(g)(1))	_____	Reference & Section Number
<input type="checkbox"/> Evaluate environmental, social, health factors (10631(g)(1))	_____	Reference & Section Number
<input type="checkbox"/> Evaluate customer impact & technological factors (10631(g)(1))	_____	Reference & Section Number
<input type="checkbox"/> Describe efforts to work with other relevant agencies to ensure implementation of the measure and to share the cost of implementation (10631 (g)(4))	_____	Reference & Section Number
<input type="checkbox"/> Describe funding available to implement any planned water supply project that would provide water at a higher unit cost (10631 (g)(3) & (h))	_____	Reference & Section Number

If Another Agency Implementing		
<input type="checkbox"/> If another Agency is implementing (10631 (g)(4))	_____	Reference & Section Number

DMM 4 - Metering with Commodity Rates (10631 (f)(1)(D))

Implementation

(Section 10631 (f) & (h))

- Describe DMM currently being implemented or scheduled for implementation (10631 (f) (1)(2)) _____ Reference & Section Number
- Describes steps necessary to implement measure _____ Reference & Section Number
- Describe the methods, if any, used to evaluate the effectiveness of this DMM (10631 (f)(3)) _____ Reference & Section Number
- Provide estimates, if available, of existing conservation savings on water use and the effect of such savings on the supplier's ability to further reduce demand (10631 (f)(4)) _____ Reference & Section Number

Provided an evaluation for this DMM if it is not implemented

(Section 10631 (g))

- Evaluate legal authority (10631(g)(4)) _____ Reference & Section Number
- Evaluate economic and non-economic factors (10631(g)(1)) _____ Reference & Section Number
- Evaluate environmental, social, health factors (10631(g)(1)) _____ Reference & Section Number
- Evaluate customer impact & technological factors (10631(g)(1)) _____ Reference & Section Number
- Describe efforts to work with other relevant agencies to ensure implementation of the measure and to share the cost of implementation (10631 (g)(4)) _____ Reference & Section Number
- Describe funding available to implement any planned water supply project that would provide water at a higher unit cost (10631 (g)(3) & (h)) _____ Reference & Section Number

If Another Agency Implementing

- If another Agency is implementing (10631 (g)(4)) _____ Reference & Section Number

DMM 5 - Large Landscape Conservation Programs and Incentives (10631 (f)(1)(E))

Implementation

(Section 10631 (f) & (h))

- Describe DMM currently being implemented or scheduled for implementation (10631 (f) (1)(2)) _____ Reference & Section Number
- Describes steps necessary to implement measure _____ Reference & Section Number
- Describe the methods, if any, used to evaluate the effectiveness of this DMM (10631 (f)(3)) _____ Reference & Section Number
- Provide estimates, if available, of existing conservation savings on water use and the effect of such savings on the supplier's ability to further reduce demand (10631 (f)(4)) _____ Reference & Section Number

Provided an evaluation for this DMM if it is not implemented

(Section 10631 (g))

- Evaluate legal authority (10631(g)(4)) _____ Reference & Section Number
- Evaluate economic and non-economic factors (10631(g)(1)) _____ Reference & Section Number
- Evaluate environmental, social, health factors (10631(g)(1)) _____ Reference & Section Number
- Evaluate customer impact & technological factors (10631(g)(1)) _____ Reference & Section Number
- Describe efforts to work with other relevant agencies to ensure implementation of the measure and to share the cost of implementation (10631 (g)(4)) _____ Reference & Section Number
- Describe funding available to implement any planned water supply project that would provide water at a higher unit cost (10631 (g)(3) & (h)) _____ Reference & Section Number

If Another Agency Implementing

- If another Agency is implementing (10631 (g)(4)) _____ Reference & Section Number

DMM 6 - High-Efficiency Washing Machine Rebate Programs (10631 (f)(1)(F))

Implementation

(Section 10631 (f) & (h))

- Describe DMM currently being implemented or scheduled for implementation (10631 (f) (1)(2)) _____ Reference & Section Number
- Describes steps necessary to implement measure _____ Reference & Section Number
- Describe the methods, if any, used to evaluate the effectiveness of this DMM (10631 (f)(3)) _____ Reference & Section Number
- Provide estimates, if available, of existing conservation savings on water use and the effect of such savings on the supplier's ability to further reduce demand (10631 (f)(4)) _____ Reference & Section Number

Provided an evaluation for this DMM if it is not implemented

(Section 10631 (g))

- Evaluate legal authority (10631(g)(4)) _____ Reference & Section Number
- Evaluate economic and non-economic factors (10631(g)(1)) _____ Reference & Section Number
- Evaluate environmental, social, health factors (10631(g)(1)) _____ Reference & Section Number
- Evaluate customer impact & technological factors (10631(g)(1)) _____ Reference & Section Number
- Describe efforts to work with other relevant agencies to ensure implementation of the measure and to share the cost of implementation (10631 (g)(4)) _____ Reference & Section Number
- Describe funding available to implement any planned water supply project that would provide water at a higher unit cost (10631 (g)(3) & (h)) _____ Reference & Section Number

If Another Agency Implementing

- If another Agency is implementing (10631 (g)(4)) _____ Reference & Section Number

DMM 7 - Public Information Programs (10631 (f)(1)(G))

Implementation

(Section 10631 (f) & (h))

- Describe DMM currently being implemented or scheduled for implementation (10631 (f) (1)(2)) _____ Reference & Section Number
- Describes steps necessary to implement measure _____ Reference & Section Number
- Describe the methods, if any, used to evaluate the effectiveness of this DMM (10631 (f)(3)) _____ Reference & Section Number

DMM 8 - School Education Programs (10631 (f)(1)(H))

Implementation

(Section 10631 (f) & (h))

- Describe DMM currently being implemented or scheduled for implementation (10631 (f) (1)(2)) _____ Reference & Section Number
- Describes steps necessary to implement measure _____ Reference & Section Number
- Describe the methods, if any, used to evaluate the effectiveness of this DMM (10631 (f)(3)) _____ Reference & Section Number
- Provide estimates, if available, of existing conservation savings on water use and the effect of such savings on the supplier's ability to further reduce demand (10631 (f)(4)) _____ Reference & Section Number

Provided an evaluation for this DMM if it is not implemented

(Section 10631 (g))

- Evaluate legal authority (10631(g)(4)) _____ Reference & Section Number
- Evaluate economic and non-economic factors (10631(g)(1)) _____ Reference & Section Number
- Evaluate environmental, social, health factors (10631(g)(1)) _____ Reference & Section Number
- Evaluate customer impact & technological factors (10631(g)(1)) _____ Reference & Section Number
- Describe efforts to work with other relevant agencies to ensure implementation of the measure and to share the cost of implementation (10631 (g)(4)) _____ Reference & Section Number
- Describe funding available to implement any planned water supply project that would provide water at a higher unit cost (10631 (g)(3) & (h)) _____ Reference & Section Number

If Another Agency Implementing

- If another Agency is implementing (10631 (g)(4)) _____ Reference & Section Number

DMM 9 - Conservation Programs for Commercial, Industrial and Institutional (10631 (f)(1)(I))

Implementation

(Section 10631 (f) & (h))

- Describe DMM currently being implemented or scheduled for implementation (10631 (f) (1)(2)) _____ Reference & Section Number
- Describes steps necessary to implement measure _____ Reference & Section Number
- Describe the methods, if any, used to evaluate the effectiveness of this DMM (10631 (f)(3)) _____ Reference & Section Number
- Provide estimates, if available, of existing conservation savings on water use and the effect of such savings on the supplier's ability to further reduce demand (10631 (f)(4)) _____ Reference & Section Number

Provided an evaluation for this DMM if it is not implemented

(Section 10631 (g))

- Evaluate legal authority (10631(g)(4)) _____ Reference & Section Number
- Evaluate economic and non-economic factors (10631(g)(1)) _____ Reference & Section Number
- Evaluate environmental, social, health factors (10631(g)(1)) _____ Reference & Section Number
- Evaluate customer impact & technological factors (10631(g)(1)) _____ Reference & Section Number
- Describe efforts to work with other relevant agencies to ensure implementation of the measure and to share the cost of implementation (10631 (g)(4)) _____ Reference & Section Number
- Describe funding available to implement any planned water supply project that would provide water at a higher unit cost (10631 (g)(3) & (h)) _____ Reference & Section Number

If Another Agency Implementing

- If another Agency is implementing (10631 (g)(4)) _____ Reference & Section Number

DMM 10 - Wholesale Agency Programs (10631 (f)(1)(J))

Implementation

(Section 10631 (f) & (h))

- Describe DMM currently being implemented or scheduled for implementation (10631 (f) (1)(2)) _____ Reference & Section Number
- Describes steps necessary to implement measure _____ Reference & Section Number
- Describe the methods, if any, used to evaluate the effectiveness of this DMM (10631 (f)(3)) _____ Reference & Section Number
- Provide estimates, if available, of existing conservation savings on water use and the effect of such savings on the supplier's ability to further reduce demand (10631 (f)(4)) _____ Reference & Section Number

Provided an evaluation for this DMM if it is not implemented

(Section 10631 (g))

- Evaluate legal authority (10631(g)(4)) _____ Reference & Section Number
- Evaluate economic and non-economic factors (10631(g)(1)) _____ Reference & Section Number
- Evaluate environmental, social, health factors (10631(g)(1)) _____ Reference & Section Number
- Evaluate customer impact & technological factors (10631(g)(1)) _____ Reference & Section Number
- Describe efforts to work with other relevant agencies to ensure implementation of the measure and to share the cost of implementation (10631 (g)(4)) _____ Reference & Section Number
- Describe funding available to implement any planned water supply project that would provide water at a higher unit cost (10631 (g)(3) & (h)) _____ Reference & Section Number

If Another Agency Implementing

- If another Agency is implementing (10631 (g)(4)) _____ Reference & Section Number

DMM 11 - Conservation Pricing (10631 (f)(1)(K))

Implementation

(Section 10631 (f) & (h))

- Describe DMM currently being implemented or scheduled for implementation (10631 (f) (1)(2)) _____ Reference & Section Number
- Describes steps necessary to implement measure _____ Reference & Section Number
- Describe the methods, if any, used to evaluate the effectiveness of this DMM (10631 (f)(3)) _____ Reference & Section Number

DMM 12 - Water Conservation Coordinator (10631 (f)(1)(L))

Implementation

(Section 10631 (f) & (h))

- Describe DMM currently being implemented or scheduled for implementation (10631 (f) (1)(2)) _____ Reference & Section Number
- Describes steps necessary to implement measure _____ Reference & Section Number
- Describe the methods, if any, used to evaluate the effectiveness of this DMM (10631 (f)(3)) _____ Reference & Section Number
- Provide estimates, if available, of existing conservation savings on water use and the effect of such savings on the supplier's ability to further reduce demand (10631 (f)(4)) _____ Reference & Section Number

Provided an evaluation for this DMM if it is not implemented

(Section 10631 (g))

- Evaluate legal authority (10631(g)(4)) _____ Reference & Section Number
- Evaluate economic and non-economic factors (10631(g)(1)) _____ Reference & Section Number
- Evaluate environmental, social, health factors (10631(g)(1)) _____ Reference & Section Number
- Evaluate customer impact & technological factors (10631(g)(1)) _____ Reference & Section Number
- Describe efforts to work with other relevant agencies to ensure implementation of the measure and to share the cost of implementation (10631 (g)(4)) _____ Reference & Section Number
- Describe funding available to implement any planned water supply project that would provide water at a higher unit cost (10631 (g)(3) & (h)) _____ Reference & Section Number

If Another Agency Implementing

- If another Agency is implementing (10631 (g)(4)) _____ Reference & Section Number

DMM 13 - Waste Water Prohibition (10631 (f)(1)(M))

Implementation

(Section 10631 (f) & (h))

- Describe DMM currently being implemented or scheduled for implementation (10631 (f) (1)(2)) _____ Reference & Section Number
- Describes steps necessary to implement measure _____ Reference & Section Number
- Describe the methods, if any, used to evaluate the effectiveness of this DMM (10631 (f)(3)) _____ Reference & Section Number
- Provide estimates, if available, of existing conservation savings on water use and the effect of such savings on the supplier's ability to further reduce demand (10631 (f)(4)) _____ Reference & Section Number

Provided an evaluation for this DMM if it is not implemented

(Section 10631 (g))

- Evaluate legal authority (10631(g)(4)) _____ Reference & Section Number
- Evaluate economic and non-economic factors (10631(g)(1)) _____ Reference & Section Number
- Evaluate environmental, social, health factors (10631(g)(1)) _____ Reference & Section Number
- Evaluate customer impact & technological factors (10631(g)(1)) _____ Reference & Section Number
- Describe efforts to work with other relevant agencies to ensure implementation of the measure and to share the cost of implementation (10631 (g)(4)) _____ Reference & Section Number
- Describe funding available to implement any planned water supply project that would provide water at a higher unit cost (10631 (g)(3) & (h)) _____ Reference & Section Number

If Another Agency Implementing

- If another Agency is implementing (10631 (g)(4)) _____ Reference & Section Number

DMM 14 - Residential Ultra-Low-Flush Toilet Replacement Programs (10631 (f)(1)(N))

Implementation

(Section 10631 (f) & (h))

- Describe DMM currently being implemented or scheduled for implementation (10631 (f) (1)(2)) _____ Reference & Section Number
- Describes steps necessary to implement measure _____ Reference & Section Number
- Describe the methods, if any, used to evaluate the effectiveness of this DMM (10631 (f)(3)) _____ Reference & Section Number
- Provide estimates, if available, of existing conservation savings on water use and the effect of such savings on the supplier's ability to further reduce demand (10631 (f)(4)) _____ Reference & Section Number

Provided an evaluation for this DMM if it is not implemented

(Section 10631 (g))

- Evaluate legal authority (10631(g)(4)) _____ Reference & Section Number
- Evaluate economic and non-economic factors (10631(g)(1)) _____ Reference & Section Number
- Evaluate environmental, social, health factors (10631(g)(1)) _____ Reference & Section Number
- Evaluate customer impact & technological factors (10631(g)(1)) _____ Reference & Section Number
- Describe efforts to work with other relevant agencies to ensure implementation of the measure and to share the cost of implementation (10631 (g)(4)) _____ Reference & Section Number
- Describe funding available to implement any planned water supply project that would provide water at a higher unit cost (10631 (g)(3) & (h)) _____ Reference & Section Number

If Another Agency Implementing

- If another Agency is implementing (10631 (g)(4)) _____ Reference & Section Number

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