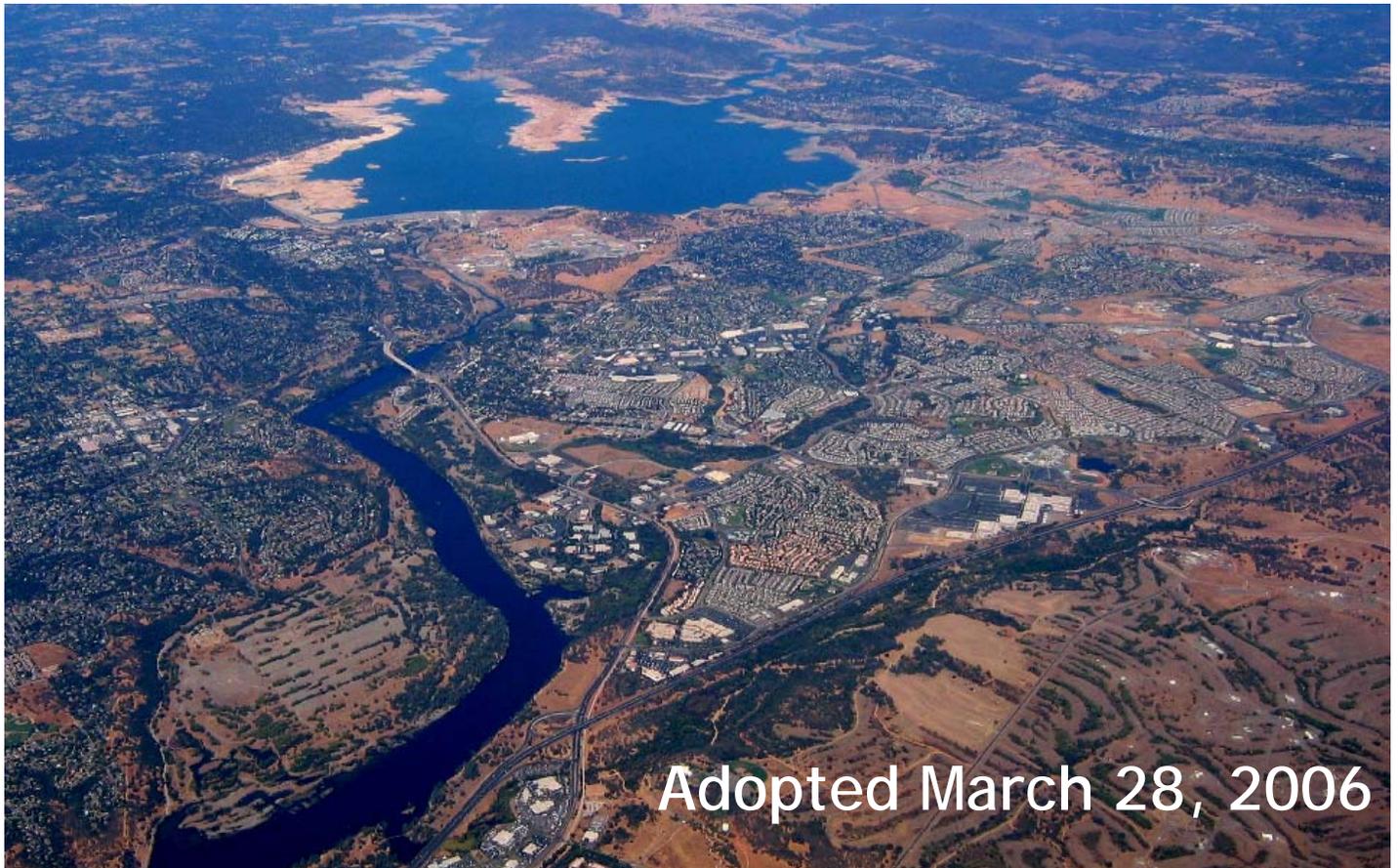




CITY OF FOLSOM 2005 URBAN WATER MANAGEMENT PLAN



Adopted March 28, 2006

City of Folsom 2005 Urban Water Management Plan

PREPARED FOR CITY OF FOLSOM



Prepared under the direction of a licensed professional engineer.

TABLE OF CONTENTS

CHAPTER 1. INTRODUCTION.....	1-1
1.1 Urban Water Management Planning Act.....	1-1
1.2 Public Participation.....	1-1
1.3 City Adoption.....	1-2
1.4 Document Organization.....	1-2
CHAPTER 2. SERVICE AREA INFORMATION.....	2-1
2.1 Description of Service Area.....	2-1
2.2 Diversion Points and Conveyance Systems.....	2-1
2.3 Population Projections.....	2-3
2.4 Climate.....	4
CHAPTER 3. WATER SUPPLY CONDITIONS.....	3-1
3.1 Existing Sources of Surface Supply.....	3-1
3.1.1 Pre-1914 Right for 22,000 Acre-Feet per Year.....	3-2
3.1.2 Pre-1914 Right for 5,000 Acre-Feet per Year.....	3-2
3.1.3 CVP Project Contract Right up to 7,000 Acre-Feet per Year.....	3-3
3.1.4 Contract Right with San Juan for a Minimum of 700 acre-feet per year.....	3-3
3.2 Other Water Service within the City of Folsom.....	3-3
3.3 Groundwater Use.....	3-4
3.4 Supply Reliability.....	3-4
3.4.1 Water Forum Agreement.....	3-4
3.4.2 Central Valley Project Contract Supply.....	3-7
3.4.3 Summary of Supply Reliability.....	3-7
3.5 Transfer and Exchange opportunities.....	3-8
CHAPTER 4. WATER DEMAND CONDITIONS.....	4-1
4.1 Historic Demands.....	4-1
4.1.1 City of Folsom Water Treatment Plant.....	4-1
4.1.2 High Water Using Industries.....	4-3
4.1.3 Natomas Ditch and Willow Hill Reservoir – Raw Water Demand.....	4-3
4.1.4 Sydney N. Peterson Water Treatment Plant.....	4-3
4.2 Current Demands.....	4-6
4.3 Projected Demands.....	4-7
4.3.1 Estimating Baseline Treated and Raw Water Demand.....	4-7
4.4 Conservation Measures and Implementation Opportunities.....	4-15
4.4.1 Summary of Demand Management Measure Assessments.....	4-16

4.4.2	Potential Reduction in Projected Demand from Conservation	4-16
CHAPTER 5.	SUPPLY/DEMAND INTEGRATION	5-1
5.1	Range of Shortfalls.....	5-1
5.2	Drought Scenarios.....	5-2
5.2.1	Single Year Drought	5-2
5.2.2	Multiple Year Drought.....	5-3
CHAPTER 6.	WATER MANAGEMENT STRATEGY.....	6-1
6.1	Internal Water Management Actions	6-1
6.2	Replacement Supplies from Partnering Water Purveyors.....	6-1
6.2.1	Water Forum Agreement Provision	6-1
6.2.2	Transfer based on Demand Modification and Local Recycling	6-2
6.2.3	Transfer based on Replacement Arrangements.....	6-2
6.2.4	Screening Replacement Supply Opportunities.....	6-3
6.3	Temporary Demand Reduction.....	6-3
6.3.1	Temporary Demand Reduction Stages.....	6-4
6.3.2	Tracking Potential Water Savings.....	6-5
6.3.3	Catastrophic Outage.....	6-5
6.4	Recycled Water Opportunities	6-5
CHAPTER 7.	RECYCLED WATER PLAN	7-1
7.1	Approach.....	7-1
7.2	Currently Identified Opportunities.....	7-2
7.2.1	El Dorado Irrigation District	7-2
7.2.2	Sacramento Regional County Sanitation District	7-2
APPENDIX A – PUBLIC OUTREACH INFORMATION.....		A-1
APPENDIX B – CITY COUNCIL ADOPTION INFORMATION		B-1
APPENDIX C – HISTORICAL AND PROJECTED POPULATION		C-1
C.1	U.S. Census Bureau Historical Population Estimates.....	C-2
C.2	Department of Finance Historical Population Estimates	C-5
C.3	SACOG Population Projections.....	C-7
C.4	Land-Use Based Population Projections.....	C-7
C.5	Choosing Population Sources for the City of Folsom Demand Study.....	C-12
C.6	Choosing Historical Data.....	C-13
C.7	Choosing Population Projections.....	C-14
APPENDIX D – DEMAND MANAGEMENT MEASURE ANALYSIS AND DESCRIPTION		D-1

DMM A – Water survey programs for single-family residential
and multi-family residential customers..... D-3

DMM B – Residential Plumbing Retrofits D-5

DMM C – System Water Audits, Leak Detection and Repair..... D-7

DMM D – Metering With Commodity Rates D-8

DMM E – Large landscape conservation programs and
incentives D-10

DMM F – High-efficiency washing machine rebate programs D-12

DMM G – Public Information Programs D-13

DMM H – School Education Programs D-15

DMM I – Conservation programs for commercial, industrial,
and institutional accounts..... D-17

DMM J – Wholesale Agency Programs D-18

DMM K – Conservation Pricing..... D-19

DMM L – Water Conservation Coordinator..... D-20

DMM M – Water Waste Prohibition D-21

DMM N – Residential Ultra-Low-Flush Toilet Replacement
Programs D-21

APPENDIX E – CITY OF FOLSOM WATER SHORTAGE CONTINGENCY
PLAN.....E-1

LIST OF TABLES

1.1 – Document Organization.....	1-3
2.1 – Projected Population Data.....	2-3
2.2 – Average Climate.....	2-4
3.1 – Primary Water Supplies.....	3-2
3.2 – Surface Water Diversions under the Water Forum Agreement.....	3-6
4.1 – Treated Water Deliveries to Folsom Serve Area East and West.....	4-2
4.2 – Historical High Water Using Industry Treated Water Demand.....	4-3
4.3 – San Juan Water District Deliveries to the Ashland Service Are.....	4-4
4.4 – SJWD Annual Deliveries to American River Canyon.....	4-5
4.5 – Current WTP Deliveries to Folsom Service Area East and West.....	4-6
4.6 – Summary of Land-Use Data.....	4-8
4.7 – Baseline Unit Demand Factors.....	4-9
4.8 – Projected High Water Using Industry Treated Water Demand.....	4-10
4.9 – Unaccounted for Water Percentage.....	4-11
4.10 – Aerojet Projected Raw Water Demand.....	4-12
4.11 – Total Projected Demand.....	4-13
4.12 –Projected Demand by Service Area and Demand Segment.....	4-14
5.1 – Current and Future Supply and Demand Scenarios.....	5-2

LIST OF FIGURES

2.1 - City Water Service Areas.....	2-2
3.1 – Representative Frequency of Staged Reductions under the Water Forum Agreement.....	3-8
4.1 – Monthly Folsom Water Treatment Plant Production Estimates.....	4-3
4.2 – Monthly Sydney N. Peterson Wastewater Treatment Plant Deliveries to Ashland Service Area.....	4-5
4.3 – American River Canyon Monthly Delivery Estimates.....	4-6
5.1 – Representative Frequency of Unimpaired Folsom Reservoir Inflow.....	5-3

CHAPTER 1. INTRODUCTION

1.1 Urban Water Management Planning Act

The City of Folsom (City) is submitting its 2005 Urban Water Management Plan (UWMP) to the California Department of Water Resources (DWR) as an update to the 2000 UWMP, adopted on February 21, 2001 pursuant to Resolution No. 6447. This update documents the City's water management plans through the year 2025.

California Water Code Section 10620(a) requires an urban water supplier to prepare and adopt a UWMP consistent with section 10640. All urban water suppliers, either publicly or privately owned, serving municipal water to 3,000 customers or supplying more than 3,000 acre-feet annually are required to prepare an UWMP. The UWMP is required for an urban water supplier to be eligible for DWR state grants and loans as well as drought assistance.

Consistent with the requirements of Water Code Section 10610, the City's UWMP contains an assessment of current and projected supplies, an evaluation of the reliability of these supplies given a range of hydrologic conditions, an assessment of demands by customer type (industrial, governmental, residential), and an explanation of water management strategies designed to integrate supply and demand conditions.

The purpose of this UWMP is to document the City's water supply planning strategies for the existing municipal jurisdiction. This UWMP is not intended to incorporate water planning elements related to the City's sphere of influence (SOI) or other potential areas of expanded water service. As the City completes the development of a comprehensive water management strategy the City will review and adopt changes to this plan, pursuant to sections 10640 through 10645.

1.2 Public Participation

The City has notified potentially interested water suppliers, local governments, and other planning agencies in the Sacramento, El Dorado, and Placer County area that it is preparing an UWMP. Agencies listed in **Appendix A** were identified for notification because information contained in the UWMP may need to be coordinated with the notified agency, or it is important that the agency know the City is undertaking the water management planning activities specified in the UWMP.

Consistent with section 10642, the City made a draft of the 2005 UWMP available to the public for review and comment beginning on November 30, 2005. The UWMP was on the City Council agenda on December 13, 2005 and written comments were received through December 12, 2005. This Plan has been modified where appropriate, to incorporate comments received from the public, interested organizations and other agencies.

1.3 City Adoption

Consistent with the provisions of the California Urban Water Management Planning Act, the City adopted its 2005 UWMP pursuant to Resolution No. 7753, a copy of which is included in **Appendix B**. Following adoption, and consistent with section 10645, the City will make the adopted plan available to the public.

1.4 Document Organization

The City's 2005 UWMP is organized according to the following chapters:

- ◆ Chapter 1: Introduction. This Chapter provides an overview of the UWMP requirements, the City's adoption process, and the document's organization.
- ◆ Chapter 2: Service Area Information. This Chapter provides general information about the City's water service area, including water supplies, population projections, and climatic conditions.
- ◆ Chapter 3: Water Supply Conditions. This Chapter provides detailed information regarding the City's water supplies and the factors affecting the reliability of these supplies.
- ◆ Chapter 4: Water Demand Conditions. This Chapter provides a detailed description of historic, current, and projected water demands by land use classification, as well as a discussion of demand management measures and conservation potential.
- ◆ Chapter 5: Supply/Demand Integration. This Chapter integrates the City's supply and demand projections for purposes of urban water management planning and identifies potential shortfalls.
- ◆ Chapter 6: Water Management Strategy. This Chapter outlines the City's internal demand management strategies, its plans for acquiring and exercising rights to replacement supplies, and its temporary demand reduction plan.
- ◆ Chapter 7: Recycled Water Plan. This Chapter describes the City's recycled water use planning efforts.

Table 1.1 cross-references the contents of each chapter to the specific water code sections and requirements, as articulated by the Department of Water Resources in their 2005 UWMP guidebook.

**Table 1.1
Document Organization**

Plan Chapter	Code Section	Plan Component
Chapter 1.1	10621(a)	Update Plan Every Fifth Year Ending in Five or Zero
Chapter 1.2	10621(b)	City and County Notification and Participation
Chapter 2.2	10631(a)	Current and Projected Population
Appendix C	10631(a)	Population Data Sets, including demographic factors
Chapter 2.3	10631(a)	Climate
Chapter 3.1, 3.2	10631(b)	Existing Water Sources and Current Supply Quantities
Chapter 3.3	10631(b)	Groundwater Management
Chapter 3.4	10631(c)(1-3)	Water Supply Reliability
Chapter 6.2	10631(d)	Transfer or Exchange Opportunities
Chapter 4.1	10631(e)(1)(2)	Past Water Use
Chapter 4.2	10631(e)(1)(2)	Current Water Use
Chapter 4.3	10631(e)(1)(2)	Projected Water Use
Appendix D	10631(f)	Demand Management Measure Analysis and Descriptions
Chapter 6	10631(h)	Planned Supply Projects and Programs
Chapter 4.4	10631(j)	California Urban Water Conservation Council Signatory
Chapter 6.3, Appendix E	10632	Water Shortage Contingency Plan
Chapter 3	10632(b)	Three-Year Minimum Water Supply
Chapter 6.4, Chapter 7	10633	Recycled Water Opportunities
Chapter 5	10635(a)	Supply and Demand Comparison
Chapter 1.2, Appendix A Appendix B	10642	Public Participation and Adoption Copy of Resolution

CHAPTER 2. SERVICE AREA INFORMATION

The purpose of this Chapter is to provide general information about the City's water service area. The chapter includes descriptions of the service area, surface supply diversion points, and conveyance systems, population projections based upon land-use based build-out projections, and general climatic conditions to account for the water demands of irrigated landscapes.

2.1 Description of Service Area

To assist with demand analysis and projections made in this document, four distinct demand areas are defined, taking advantage of service area designations and previously defined boundaries. The following four distinct water service areas are depicted in **Figure 2.1**:

- ◆ Folsom Service Area - West
- ◆ Folsom Service Area - East
- ◆ Ashland Area
- ◆ American River Canyon Area

The first two are located south of the American River and the last two are north of the American River. Each of these four service areas has different supply sources and conveyance mechanisms.

2.2 Diversion Points and Conveyance Systems

The City uses water from two primary diversion points, both of which draw surface water from Folsom Reservoir:

- ◆ For areas south of the American River, the City takes deliveries from the Natoma Pipeline, a 42-inch steel pressure pipe that originates at Folsom Dam. The Natoma Pipeline splits into three separate lines: one line to the Folsom Prison water treatment plant, one line to the Folsom Water Treatment Plant (Folsom WTP), and another line to the Natomas Ditch.

After treatment at the City's plant, water is stored and pumped through a system of reservoirs and pumping stations to seven pressure zones within the City, and a small pressure zone in Southwest Folsom (the Nimbus Zone) that extends slightly beyond the City limits.

The Natomas Ditch carries raw water to Willow Hill Reservoir for releases to Aerojet.

- ♦ For areas north of the American River, water is diverted from the Folsom Reservoir and piped to the Sydney N. Peterson Water Treatment Plant, which is owned and operated by San Juan Water District (SJWD). After treatment, water is stored in Hinkle Reservoir until SJWD releases it and pumps or delivers it by gravity flow to one of two delivery areas – American River Canyon or Ashland (See Figure 2.1). While SJWD provides water supplies to both of these service areas, the City physically serves the SJWD water to customers in the Ashland service area, while SJWD directly serves customers in American River Canyon.

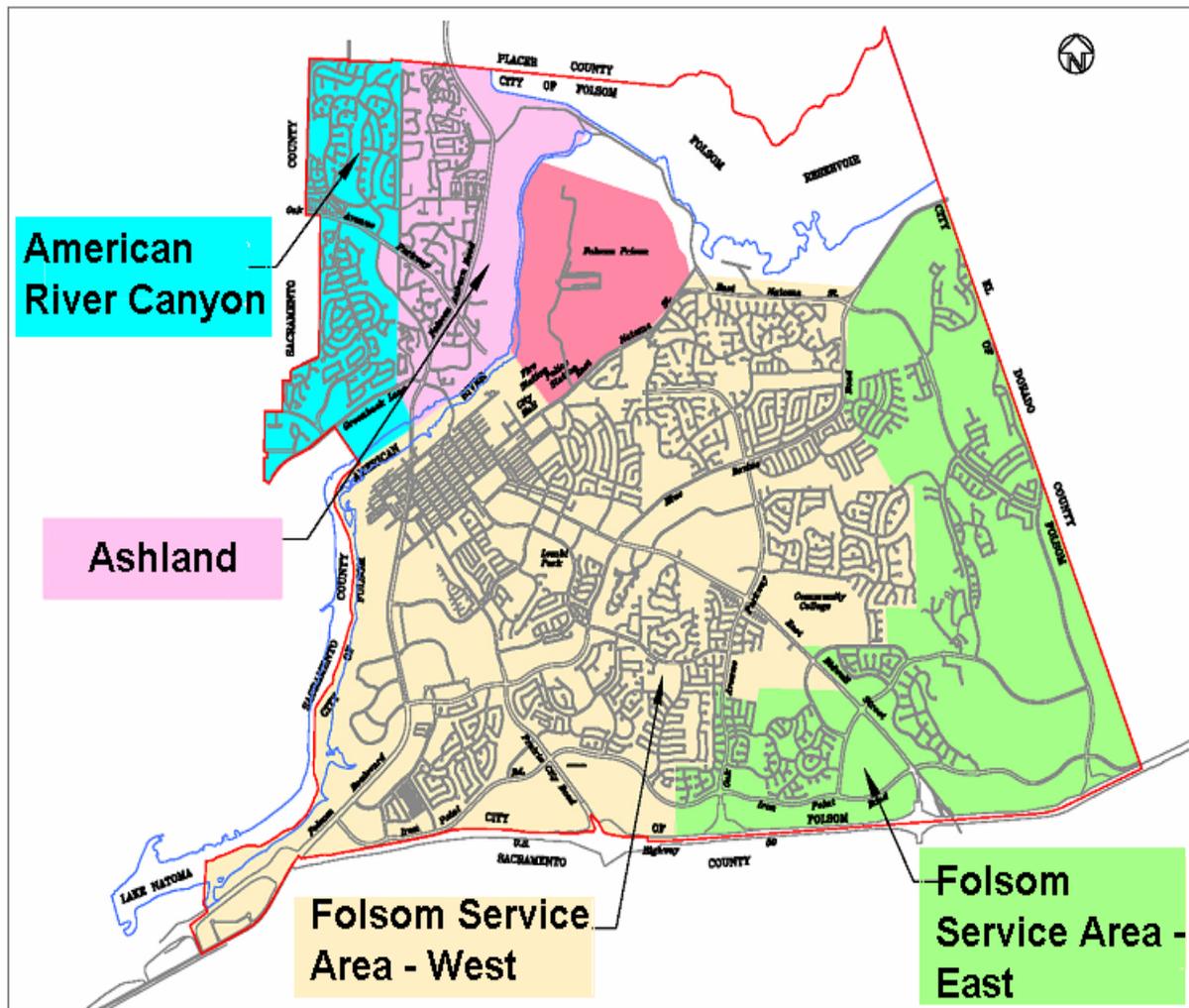


Figure 2.1: City Water Service Areas

2.3 Population Projections

Population estimates were generated using a variety of data from federal, state, and local sources. Detailed information regarding the population analysis is included in **Appendix C**. Both historical data and future projections are provided in this analysis, with linear interpolation for incremental time periods between defined years. (For example, interpolations were made between 2000 U.S. Census data and projections for build-out population assumed to occur in 2010.) Three alternative sources were used to project future populations for the City:

- ◆ The City’s earlier planning reports (City of Folsom 1998, 2003 Water Master Plan) included population projections through build-out for both the North and South Areas.
- ◆ Sacramento Area Council of Governments (SACOG) projections provided City-wide estimates – not service areas estimates.
- ◆ Land-use based projections for build-out conditions based on City land-use data.

Because of the large differences between U.S. Census data and the previous planning reports for the North Area (i.e., 7,933 versus 4,709 in 1990, and 8,874 versus 11,000 in 2000, respectively), and since the SACOG projections were not on a service area level, the land-use based build-out projections were used as the primary source for projecting the City’s population in all four service areas.

To complete the dataset for the annual population projections, linear interpolation was used for the North Area between developed (2003) and build-out (2006) years. For the South Area, where build-out is anticipated in 2010, linear interpolation was used for the years between 2004 and 2010. The resulting projections are shown in Table 2.1.

Date¹	American River Canyon	Ashland	South Area	All Folsom (without Prison)
2005	5,269	4,208	51,398	60,876
2006	5,285	4,269	53,448	63,002
2007	5,285	4,269	55,497	65,051
2008	5,285	4,269	57,547	67,101
2009	5,285	4,269	58,574	68,123
2010	5,285	4,269	59,602	69,156

All future populations through 2025 are assumed to remain at 2010 levels.

¹ All population estimates are for January 1 of the given year.

2.4 Climate

The City service area has cool and humid winters, as well as hot and dry summers. The City lies approximately 20 miles east of the City of Sacramento. The City’s average daily temperature ranges from 38 to 95 degrees Fahrenheit (**See Table 2.2**), but the extreme low and high temperatures have been 16 and 115 degrees Fahrenheit respectively (Western Regional Climate Center, 2005). As shown in **Table 2.2**, the historical annual average precipitation is approximately 24 inches. The rainy season begins in November and ends in March. Average monthly precipitation during the winter months is about 3 to 4 inches, but records show that the monthly precipitation has been as high as 13.5 inches and as low as 0 inches. Relative humidity in the region ranges from 29 percent to 90 percent. Low humidity usually occurs in the summer months, from May through September. The combination of hot and dry weather during the summer results in high water demands during the summer.

Also shown in **Table 2.2** is the average ETo, or reference evapotranspiration, which is an indicator, among other things, of the water demands for irrigated landscapes.

Table 2.2:							
Average climate data for areas around the City of Folsom²							
	Jan	Feb	Mar	Apr	May	Jun	
Ave. Max Temp (F)	54	60	64	71	79	88	
Ave. Min Temp (F)	38	42	44	47	51	57	
Ave. Precip (in.)	4	4	4	2	1	0	
Ave. ETo (in.)	2	2	4	5	7	8	
	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Ave. Max Temp (F)	95	93	88	78	64	55	74
Ave. Min Temp (F)	60	60	57	53	45	39	49
Ave. Precip (in.)	0	0	0	1	3	3	24
Ave. ETo (in.)	9	8	6	4	2	2	57

² Western Regional Climate Center and CIMIS, October 2005

CHAPTER 3. WATER SUPPLY CONDITIONS

Chapter 3 describes the City’s water supplies through an analysis of its various water rights. Notably, 99 percent of the City’s water is from surface supplies, and groundwater is only used on a limited basis for golf course irrigation. As discussed in Chapter 7, the City does not currently utilize recycled water, but is evaluating potential re-use opportunities.

Chapter 3 also provides a detailed description of the potential reduction scenarios for the City’s water rights, including associated risks as a signatory to the Water Forum Agreement, and to its Central Valley Project contract supplies. Transfer and exchange opportunities are more fully described in Chapter 6.2.3.

3.1 Existing Sources of Surface Supply

The City’s water supply is derived from four different water rights:

- ◆ A pre-1914 water right for 22,000 acre-feet per year
- ◆ A pre-1914 water right for 5,000 acre-feet per year
- ◆ A Central Valley Project (CVP) contract entitlement for 7,000 acre-feet per year
- ◆ A contract entitlement with the San Juan Water District for a minimum of 700 acre-feet per year

All of these supplies were developed through different circumstances and, as such, are subject to unique conditions and limitations.³ These attributes and issues combine to provide each right with a certain risk of reduction. The four supplies are summarized in **Table 3.1**:

³ The water supply analysis is based on water rights documentation provided by the City of Folsom.

Table 3.1 City of Folsom Primary Water Supplies			
Water Right	Supply Volume	Point of Delivery	Area Served
Pre-1914	22,000	Folsom Reservoir and Folsom South Canal	City of Folsom and Surrounding Regions
Pre-1914	5,000	Folsom Reservoir and Folsom South Canal	City of Folsom and Surrounding Regions
CVP Project Supply	7,000	Folsom Reservoir	Folsom East Area
San Juan Water District Contract Water	all of the treated water required or a minimum of 700 acre-feet	From San Juan Water District facilities	Ashland Area
San Juan Service Area Water	As necessary to meet the needs of the citizenry	San Juan Water District facilities	American River Canyon Area

3.1.1 Pre-1914 Right for 22,000 Acre-Feet per Year

The City’s 22,000 acre-foot entitlement is based on a pre-1914 appropriative right from the South Fork of the American River established by the Natoma Water Company (Natoma) in 1851. Natoma’s original pre-1914 water right established a maximum diversion rate “to fill a Canal Eight feet wide and Four feet deep with a current running Ten miles per hour.”⁴ This translates into a diversion rate of 60 cfs and a maximum allocation of 32,000 acre-feet per year. The place of use under the pre-1914 right included a wide area that encompasses the City and additional surrounding areas. The 1851 filing is the earliest in priority of perfected appropriative rights and this right is senior to all water right applications to appropriate water filed with the State Water Resources Control Board (SWRCB).

3.1.2 Pre-1914 Right for 5,000 Acre-Feet per Year

The City’s 5,000 acre-foot entitlement is also based on Natoma’s pre-1914 appropriative right from the South Fork of the American River. In November 1994, Southern California Water Company-Folsom Division (SCWC) signed a contract with the City to lease 5,000 acre-feet of water per year (of SCWC’s remaining 10,000 acre-feet under the original Natoma purchase) for an indefinite period. SCWC has no right to terminate the lease.

⁴ Mining Claim Recorded on December 27, 1851 in El Dorado County, Book “A” of Mining Locations at Page 144.

3.1.3 CVP Project Contract Right up to 7,000 Acre-Feet per Year

On April 8, 1999, the Bureau of Reclamation (Reclamation) entered into Contract No. 6-07-20-W1372 with the Sacramento County Water Agency (SCWA) under Section 206 of Public Law 101-514. The contract dedicated 22,000 acre-feet of water to SCWA, commonly called “Fazio Water.” The Fazio water supply is a standard “project supply” water right – derived entirely from the new supplies created by the development of the Central Valley Project (CVP) system. These supplies are junior to water rights that existed prior to the development of the CVP and are more likely than some other forms of water rights to be burdened with reduction.

The City was specifically named in the SCWA-Reclamation contract as a subcontractor to gain benefit of a portion of the Fazio supply. On April 25, 2000, SCWA entered into a separate contract with the City to provide 7,000 acre-feet of the 22,000 acre-feet of Fazio water.

3.1.4 Contract Right with San Juan for a Minimum of 700 acre-feet per year

The City has a contract with the San Juan Water District (SJWD) for use in the “Ashland Area” – a geographical sub-area of the City’s “North Area” (See **Figure 2.1**). In the Ashland Area, the City controls the water conveyance facilities but the water provided to those facilities is delivered by SJWD.

In a 1983 contract and its amendments, SJWD agreed to sell, and the City agreed to purchase, “all of the treated water required by the City for retail service within the area of the City North and West of the American River [or] a minimum of 700 acre-feet” of water each year. The water furnished by SJWD shall “meet the State requirements for drinking water.” SJWD has honored its commitment under contract by providing all of the treated water required by the City for service in the Ashland Area.

3.2 Other Water Service within the City of Folsom

SJWD serves water to another geographical sub-area of the City’s North area – the American River Canyon Area (See **Figure 2.1**). This area is wholly contained within the City’s boundaries and is described as the area North and West of Folsom-Auburn Boulevard. SJWD is charged with providing water to all of the users within its District boundaries and coping with supply shortages.

In the American River Canyon Area, the City owns none of the water conveyance facilities and provides no water supplies.

3.3 Groundwater Use

Groundwater use within the City's service area is limited to private use by the Empire Ranch Golf Course and as an emergency supply for Intel Corporation. The golf course uses groundwater in the spring and early summer months as a primary source of irrigation water. As the irrigation season progresses, groundwater levels typically decline and the golf course purchases supplemental potable surface supplies from the City.

To better understand the groundwater conditions and supply potential that may underlie the golf course and other areas within the City limits, the City has initiated a Groundwater Resources Investigation through an AB 303 grant (See Sidebar).

In addition to groundwater use by the golf course, Intel has established two emergency backup wells capable of delivering 100 and 15 gpm, respectively.

3.4 Supply Reliability

The following section examines two key agreements that reduce the City's water supply under certain described conditions. The first section will describe the City's obligations under the Water Forum Agreement and the second section will describe the City's obligations under the Sacramento Groundwater Authority Agreement. Both of these agreements affect supplies to Folsom West and East service areas.

3.4.1 Water Forum Agreement

By signing the Water Forum Agreement in 1999, the City accepted a negotiated baseline water supply and agreed to reduce its surface water diversions from Folsom Reservoir in certain year types. The City's baseline surface water supply from the American River in

Folsom's AB 303 Groundwater Resources Investigation

Phase 1 of the investigation is both a "desktop" study based on existing data and information previously developed by others, and a field investigation that includes exploratory drilling and well testing and one year of water level and quality monitoring. The goals of Phase 1 are to develop a conceptual hydrogeologic model of the study area that will be tested with field investigations to allow an assessment of the City's groundwater resources potential.

The Phase 1 scope of work includes the following general work tasks:

- Project management, oversight, reporting, and public outreach
- Review of previous water resources data and development of a Geographical Information System (GIS) and conceptual hydrogeologic model for the study area;
- Conducting test well drilling, construction, sampling and testing
- Performing two events of water level and quality monitoring

The work is expected to be completed by May 1, 2006.

average and wet years will increase from the 1999 estimated delivery of 20,000 acre-feet per year to 34,000 acre-feet per year by 2030⁵ to reflect expected growth in demand.

An average or wet year is defined under the Agreement as unimpaired inflow into Folsom Reservoir from March through November that exceeds 950,000 acre-feet per year. The probability of an average or wet year inflow of this volume is 82 percent, meaning that this inflow has occurred approximately 8 out of every 10 years.⁶ Accordingly, the City has a good chance of receiving its full annual surface water allocations from Folsom Reservoir in any given year.

In drier years – defined by the Water Forum Agreement as Stages 1, 2, and 3 – the City has agreed to reduce its diversions from Folsom Reservoir. These reductions are relatively proportional to reductions in March through November unimpaired inflow into Folsom Reservoir of less than 950,000 but equal to or more than 400,000. The decreased inflows would require the City’s allowable surface diversions to drop from 34,000 acre-feet to 22,000 acre-feet, separated into a three-stage stepped and ramped reduction in proportion to the decreased inflows. These reductions are known as “the Water Forum Wedge.”

- ◆ Under Stage 1 reductions where the unimpaired inflow to Folsom Reservoir is greater than 870,000 acre-feet but less than 950,000 acre-feet, the City will divert a decreasing amount from 34,000 acre-feet to 30,000 acre-feet in proportion to the reduced flow into Folsom Reservoir.
- ◆ Under Stage 2 reductions where the unimpaired inflow to Folsom Reservoir in March through November is greater than 650,000 acre-feet but less than or equal to 870,000 acre-feet, the City will divert a maximum of 27,000 acre-feet.
- ◆ Under Stage 3 when the unimpaired inflow to Folsom Reservoir in March through November is equal to or greater than 400,000 acre-feet but less than or equal to 650,000 acre-feet, the City will divert a maximum of 22,000 acre-feet.

The differences in these staged reductions are important. Stage 1 reductions are different than Stage 2 and Stage 3 reductions because the reduced Stage 1 surface supply diversion is directly proportional to the decreased inflow. Under Stages 2 and 3, maximum

⁵ 2030 was the projection date used by the Water Forum, but Folsom expects that demand to be reached by 2025.

⁶ The State of California Department of Water Resources (DWR) conducts annual snowpack surveys and provides a forecast of runoff for the American River watershed along with other watersheds in the State beginning in February and ending in May of each year. Results of these four surveys are published annually in a series of State DWR Bulletins (Bulletin 120-1 through 120-4) and are the basis for determining the unimpaired inflow into Folsom Reservoir; Water Forum Proposal Final EIR, October 1999 at Appendix I.

diversion rates are set based on the stated range of inflow into Folsom Reservoir. Accordingly, diversion reductions under Stage 1 may require different types of supply augmentation mechanisms than those required under the other two stages.

In the driest years – also called the conference years – when the March through November unimpaired inflow to Folsom Reservoir is less than 400,000 acre-feet, the City will reduce diversions to a maximum of 20,000 acre-feet. The City is committed to further reduce diversions in the driest years to 18,000 acre-feet by imposing extraordinary conservation measures throughout its service area. Although the City is committed to this significant surface diversion reduction in the driest years, the Water Forum Agreement has the following caveat:

[I]t is recognized that in years when the projected unimpaired inflow to Folsom Reservoir is less than 400,000 acre-feet there may not be sufficient water available to provide the purveyors with the driest years quantities specified in their agreements and provide the expected driest years flows to the mouth of the American River. In those years the City will participate in a conference with other stakeholders on how the available water should be managed.

Table 3.2 represents various City surface water diversion scenarios under the Agreement:

Table 3.2			
Surface Water Diversion Scenarios under the Water Forum Agreement			
Water Forum Year Type	City of Folsom Unimpaired Inflow	City of Folsom Surface Water Diversion	Probability of year type or above⁷
Average or Wet Year	Greater than 950,000 AF	34,000 AF	82%
Stage 1	950,000 to 871,000 AF	34,000 to 30,000 AF	90%
Stage 2	870,000 to 651,000 AF	27,000 AF	95%
Stage 3	650,000 to 400,000 AF	22,000 AF	97%
Driest Years (conference years)	<400,000 AF	20,000 to 18,000 AF	99%

The Agreement also provides that the City will enter into agreements with other suppliers that have access to both surface water and groundwater for an equivalent exchange of the amount of reduction needed by the City, as outlined above in the three stages of reduction. Under these arrangements, those suppliers will use other surface or groundwater supplies in lieu of surface water taken from the American River that is

⁷ DWR Bulletins (Bulletin 120-1 through 120-4) and are the basis for determining the unimpaired inflow into Folsom Reservoir; Water Forum Proposal Final EIR, October 1999 at Appendix I; telephone call with Jim McCormack, Consultant to the Water Forum on September 20, 2004; telephone call with Walter Bourez, MBK Engineers on September 27, 2004.

equivalent to the amount that the City will continue to divert.⁸ Accordingly, the Water Forum stakeholders have authorized the City to enter into agreements to augment supplies in dry years.

In summary, the Agreement restrains the City's ability to utilize its entire surface water allocation from the American River. The Agreement, however, gives the City a 95% chance of being *entitled* to divert at least 27,000 acre-feet of its surface diversion rights from Folsom Reservoir.

3.4.2 Central Valley Project Contract Supply

For the water supply discussed in Chapter 3.1.3, the primary SCWA-Reclamation contract addresses supply reductions. The contract states that if Project Water supply is reduced because of “physical operations of the Project, drought, or other physical causes beyond the control of [the Bureau]” the Contracting Officer “shall apportion the available Project Water supply... among existing contracts and future contracts...” Accordingly, when supply reductions are required, water will be allocated by the contracting officer.

The supply forecasts coupled with the contracting officer's discretion often result in deliveries that do not match the contract supply. During the projection period, Reclamation may declare a “reduced supply” based on hydrologic conditions. Based on that declaration, Reclamation has, as a matter of policy, reduced municipal and industrial deliveries to a maximum of 75% of the contract entitlement, but retains the discretion to impart greater reductions.

Reclamation also uses another accounting technique that further diminishes the supply allocations. Reclamation delivers only 75% of the contracting entities historical use based on the last three years of full deliveries. For example, if the City had only used an average of 4,000 acre-feet of water over the last three years of full deliveries from Reclamation, when Reclamation declares a water short year, the City would only be entitled to use 3,000 acre-feet (75% of 3 year full demand) instead of 5,250 acre-feet (75% of full contract entitlement). Accordingly, the City's use of this Project Supply water is subject to numerous restrictions and should not be relied on as a secure source of supply.

3.4.3 Summary of Supply Reliability

As discussed in the previous sub-chapters, the water supply available to the City is primarily dictated by the Water Forum Agreement. Staged reductions in diversions, as specified under the Agreement, are predicated on determinations of the unimpaired inflow to Folsom Lake. Because there can be various permutations of single and multiple

⁸ In some instances, suppliers may transfer excess surface water supplies to Folsom, but the Water Forum Agreement is silent on this issue.

dry year scenarios as a result of these staged reductions, the City is identifying temporary demand reduction actions as well as securing dry-year water supply agreements to handle multiple dry years. **Figure 3.1** provides a representation of the potential frequency of staged reductions faced by the City. Seventy years of historic unimpaired flow data is representative of potential future conditions. More details regarding expected shortfalls and associated water management strategies are included in Chapters 5 and 6, respectively.

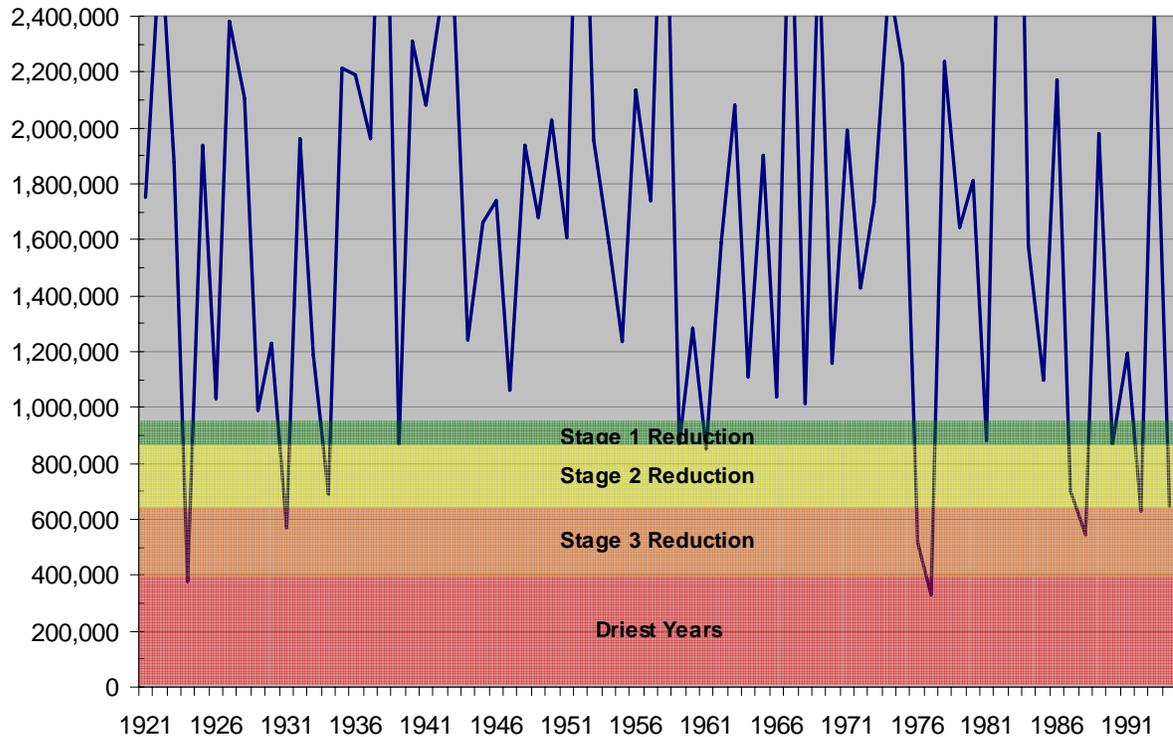


Figure 3.1: Representative Frequency of Staged Reductions under the Water Forum Agreement

3.5 Transfer and Exchange opportunities

As part of efforts to secure reliable dry-year supplies as provided for in the Water Forum Agreement, the City is investigating water transfer and exchange opportunities with a number of water purveyors in the greater Sacramento region. These investigations are in their infancy, and, as such, there are no details available for inclusion in this UWMP Update at this time. Further discussion of the general approach to water transfer and exchange opportunities is included in Chapter 6.

CHAPTER 4. WATER DEMAND CONDITIONS

Sub-chapters 4.1-4.2 outline water treatment plant service zone distribution figures to establish a historic demand factor for the portion of the City south of the American River, and the water deliveries to service zones north of the American River, including the Ashland area and American River Canyon. Chapter 4 also highlights the current and future demands of high water using industries (HWUI), as well as raw water demands sent to Willow Hill Reservoir and ultimately delivered to Aerojet.

Sub-chapter 4.3 provides baseline projections of future demand using land-use based projections of the number of residential dwelling units or acres of other land classifications, multiplied by unit demand factors. These baselines are adjusted by an “unaccounted for water” factor that assumes a degree of distribution losses, fire hydrant flushing, and construction water and therefore more accurately reflects use throughout the system.

Finally, sub-chapters 4.3.2-4.3.4 summarizes the City’s Demand Management Measures and project demand reductions through continued implementation of these measures.

4.1 Historic Demands

Obtaining historical delivery data is a critical component of a demand analysis. For this analysis, historical data was used to ground the results of projected future water demands. The City provided data and information for historical deliveries from the Folsom Water Treatment Plant and Willow Hill Reservoir, and San Juan Water District provided data for the area north of the American River.

4.1.1 City of Folsom Water Treatment Plant

For the portion of the City south of the American River (defined as Folsom Service Areas – West and East), treated water is supplied through the Folsom Water Treatment Plant (Folsom WTP). The plant has a nominal capacity of 40 mgd, and has been retrofitted to accommodate recycling of plant operations water. Historical monthly production quantities from the treatment plant were obtained from production tables provided by the City (City, 2004), and from earlier planning documents (City of Folsom, 1998, 2003).

The production data from January 1996 to March 2004 (City of Folsom, 2004) included monthly volumes both at the inlet to the plant as well as the individual quantities delivered to each water service zone. Conversations with the City resulted in a determination that the sum of deliveries to individual zones was a closer approximation of actual water production than the flow measurements taken at the inlet to the plant. This is likely due to the fact that flow rates at the plant’s inlet often exceed the flow meter’s maximum rating (25 cfs). The meters used for the individual zones, in contrast, are operated within their ratings. The summation of the individual zone flows may slightly underestimate the treatment plant’s water production, since it neglects losses that may occur between the outlet of the treatment

plant and the zone’s flow meters. Comparison with historical production data presented in the earlier planning documents (City of Folsom, 1998, 2003) indicates that this difference is probably negligible.

Table 4.1 includes annual delivery data for 1986-1989 (City of Folsom, 1998), 1990-2002 (City of Folsom, 2003), and 1996-2003 (City of Folsom, 2004) from the Folsom WTP to Folsom Service Areas East and West. **Figure 4.1** shows the monthly Folsom WTP production data from each of the three sources, through March 2004. **Figure 4.1** demonstrates two findings: 1) the Folsom WTP linear increase in production through about 1995, and the more recent acceleration in production to meet ongoing growth – especially within Folsom Service Area – East⁹.

Table 4.1	
WTP Delivery Data to Folsom Service Area East and West	
Year	Deliveries (acre-feet)
1986	3,846
1987	4,569
1988	4,707
1989	5,445
1990	7,033
1991	6,941
1992	8,398
1993	8,933
1994	10,423
1995	10,828
1996	10,940
1997	13,741
1998	12,656
1999	16,394
2000	16,403
2001	21,355
2002	21,230
2003	21,702

⁹ An overlap between the 2003 and 2004 sources is included to ensure consistency of data.

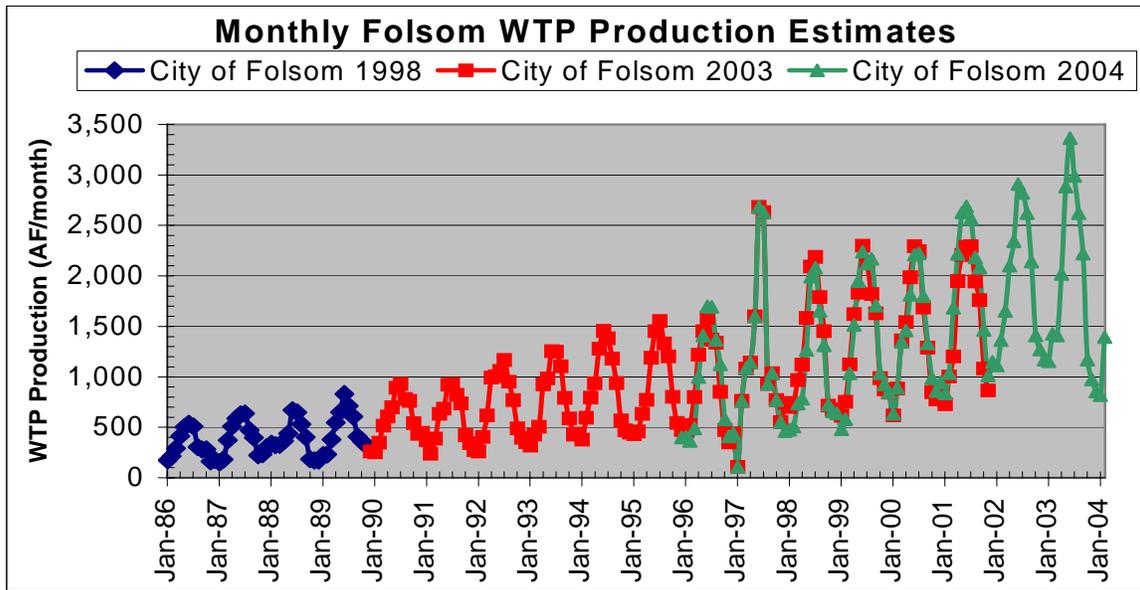


Figure 4.1: Monthly Folsom WTP Production Estimates

4.1.2 High Water Using Industries

Four industries in the City have historically purchased large quantities of treated water from the City’s facilities: Aerojet, Intel, Kikkoman, and Gekkeikan. Historical deliveries for these High Water Using Industries (HWUIs) were only available for 1996, 2000, and 2004, and are shown in **Table 4.2**.

Year	Aerojet	Intel	Kikkoman	Gekkeikan	Total
1996	199	253	0	37	489
2000	265	297	134	67	763
2004	339	273	130	47	789

4.1.3 Natomas Ditch and Willow Hill Reservoir – Raw Water Demand

In addition to treated water supplies, raw water is also delivered by the City. This water is conveyed by pipeline and above ground through a conduit called the Natomas Ditch, which eventually empties into Willow Hill Reservoir. Aerojet diverts raw water from the reservoir to meet part of its needs. Historical records from the raw water meters at Aerojet indicate an average annual use of about 2,700 acre-feet.

4.1.4 Sydney N. Peterson Water Treatment Plant

For the area north of the American River, water is diverted through the Sydney N. Peterson Water Treatment Plant (SNPWTP), where it is then pumped or conveyed by gravity to the

Ashland and American River Canyon areas. Data for historical deliveries were obtained from the San Juan Water District (SJWD), which supplies water to both areas. For Ashland, annual delivery data was provided for 1985 through 2003, along with monthly deliveries from January 1990 through March 2004 (SJWD, 2004). This information is shown in **Table 4.3** and **Figure 4.2**. Unlike the increase in deliveries seen in the Folsom Service Areas, these data show a fairly stable delivery history – indicating fairly stable demand.

Year	Production (acre-feet)
1985	1,091
1986	1,594
1987	1,787
1988	1,716
1989	1,626
1990	1,624
1991	1,520
1992	1,164
1993	1,115
1994	1,292
1995	1,063
1996	1,076
1997	1,102
1998	1,059
1999	1,141
2000	1,324
2001	1,138
2002	1,149
2003	1,107

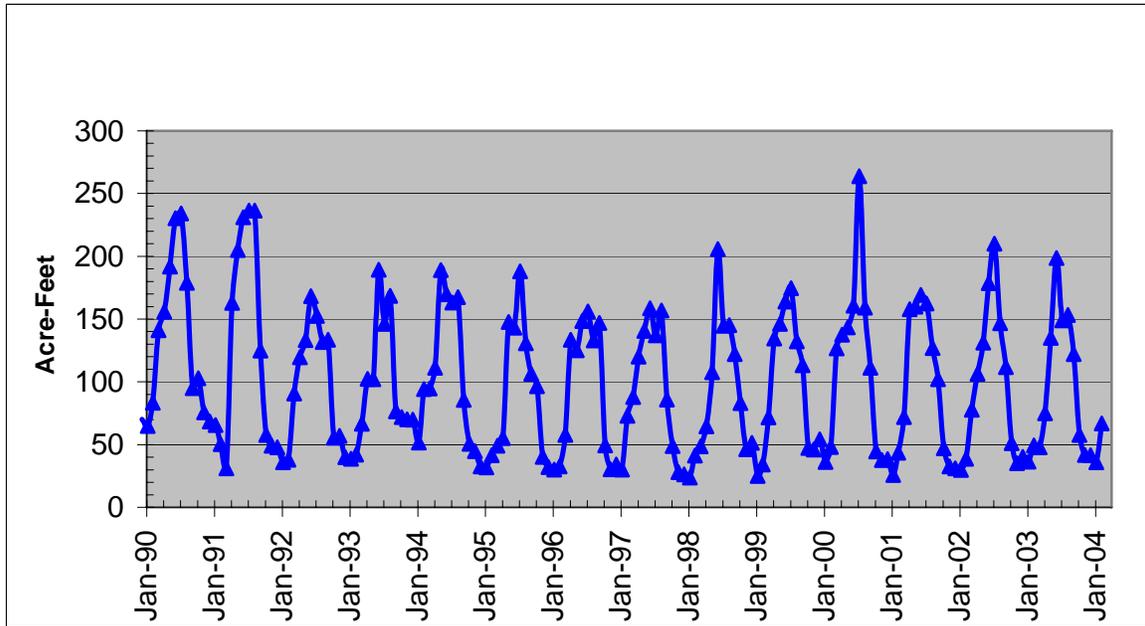


Figure 4.2: Monthly Sydney N. Peterson Water Treatment Plant Deliveries to Ashland Service Area

For American River Canyon, monthly deliveries for January 1999 to May 2004 were obtained from SJWD (SJWD, 2004). Annual delivery quantities for 1999 to 2003 are shown in **Table 4.4**, and monthly delivery quantities are shown in **Figure 4.3**. Deliveries for the Northern and Southern portions of American River Canyon are measured monthly. The deliveries to each American River Canyon sub-area are also included in **Figure 4.3**, along with the total deliveries. Deliveries for the Southern portion sometimes appear to approach zero since the Southern area is occasionally supplied with water routed through the northern sub-area rather than through the flow meters installed in the south area. Though this service area appears to have experienced an increase in deliveries since 1999, the past few years appear to be stable – likely indicating little additional growth.

Year	Deliveries (acre-feet)
1999	1,089
2000	1,178
2001	1,544
2002	1,660
2003	1,759

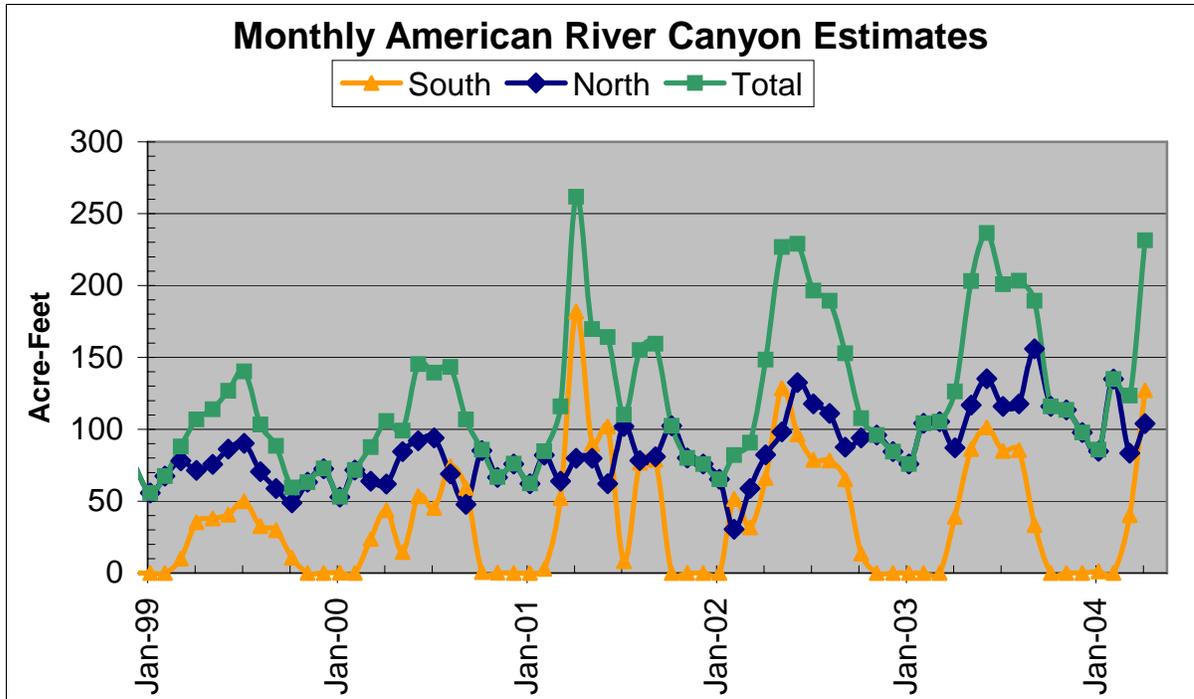


Figure 4.3: American River Canyon Monthly Delivery Estimates

4.2 Current Demands

The City’s demand for potable water continues to rise as foundations are constructed in areas slated for development – especially in the Folsom Service Area - East (see **Figure 2.1**). **Table 4.5** shows the most recent water treatment plant delivery data for Folsom Service Areas East and West. These values also include a significant, but unquantified, use by construction companies as they continue to build designated projects. This construction water increases the water treatment plant deliveries to levels greater than would be required if potable supplies were only being used for standard municipal uses – skewing the value higher when compared to projected demands (see **Table 4.11**). Thus, when the construction ends, this water need also ends.

Year	Deliveries (acre-feet)
2004	22,438
2005	21,952

In addition to the demand for treated municipal supplies, Aerojet continues to receive raw water from Willow Hill Reservoir. In 2004, Aerojet received 2,731 acre-feet. Losses in the delivery to and from Willow Hill Reservoir to Aerojet account for roughly another 400 acre-feet. In total, The City diverted approximately 25,500 acre-feet of its available supplies to meet demands in 2004.

4.3 Projected Demands

This section presents the City's estimation of projected water demands. The analysis is based on first assessing baseline future demand – using projected land-use information multiplied by unit water demand factors representing existing use characteristics – and then adding additional demands for specific known uses not considered in the land-use analysis. After projecting baseline demands, the City can assess the potential benefit of its conservation efforts including the benefit of best management practices required as a signatory to the Water Forum Agreement.

4.3.1 Estimating Baseline Treated and Raw Water Demand

Baseline projections of future demand for the existing service area¹⁰ were estimated using land-use based projections of the number of residential dwelling units or acres of other land classifications, multiplied by unit demand factors that vary with each classification. The City anticipates full build-out within its existing City limits by 2010. Therefore, baseline demand projections remain constant after 2010¹¹. The vast majority of additional construction will occur in the Folsom West and East service areas. Only minor infill projects are anticipated in the Ashland service area and the American River Canyon service area is fully built-out (and is not served by Folsom).

Projected Land Use: The primary source for the land-use based water demand projections was data obtained from the City, including land-use classification data for the entire City for “developed” and “build-out” conditions. The data consisted of tables of acreage levels and housing unit numbers for individual developments within the City, indexed by service area. **Table 4.6** shows an aggregated summary of the information provided by the City, organized by service area.

In deriving the entries in **Table 4.6** for the FSA-West area, acreage occupied by Kikkoman, Intel, and Gekkeikan was subtracted in order to avoid double-counting water demands, since these demands are estimated separately (as high-water using industries) later in this subsection.

¹⁰ The American River Canyon Area is not served by the City. The Ashland service area is served with water obtained from San Juan Water District under a contract with specific reliability provisions. Both service areas are at, or nearly at, build-out.

¹¹ Projected demand may decrease over time as a result of conservation measures. This is analyzed in later in this chapter.

Table 4.6				
SUMMARY OF LAND-USE DATA (in dwelling units (du) or acres)				
	FSA - West	FSA - East	FSA - West	FSA - East
	Existing (2005)		Buildout (2010)	
Rural Residential (du)	111	0	116	0
Very Low Density (du)	6533	2512	6845	3395
Low Density Residential (du)	4318	1703	4535	2302
Medium Density (du)	892	322	1080	759
Medium-High Density (du)	2172	368	2734	923
High Density (du)	351	96	442	240
Moderate Intensity Office	241	45	328	117
Community/Neighborhood Retail	338	68	459	147
Regional Retail	145	68	197	152
Light-Industrial Office	48	2	66	6
Light Industrial	48	5	66	12
Heavy Industrial	10	2	13	6
High Water Using Industries	176	0	211	0
Hospital	0	0	0	50
Public/Quasi-Public	68	20	92	53
Neighborhood Commercial/Office	48	11	66	29
Regional Commercial/Office	19	5	26	12
Park	262	284	267	350
Schools	312	19	312	71
Lighting and Landscape	150	100	150	110

Unit Water Demand Factors: Baseline unit water demand factors – used to establish an acre-foot-per-unit (or per acre) per year demand for a particular type of land-use – were applied to the values in **Table 4.6** to estimate future water demands. **Table 4.7** shows the unit demand factors used for the respective land-use designations.

**Table 4.7
Baseline Unit Demand Factors**

Land-use Category	Use Class	Demand Factor	% of acreage
Residential (acre-feet/du/year)			
Rural Residential	indoor	0.2	
	outdoor	0.39	
	Total	0.59	
Very Low Density Residential	indoor	0.2	
	outdoor	0.39	
	Total	0.59	
Low Density Residential	indoor	0.2	
	outdoor	0.45	
	Total	0.65	
Medium Density Residential	indoor	0.2	
	outdoor	0.36	
	Total	0.56	
Medium-High Density Residential	indoor	0.2	
	outdoor	0.2	
	Total	0.4	
High Density Residential	indoor	0.2	
	outdoor	0.1	
	Total	0.3	
Non-Residential (acre-feet/acre/year)			
Moderate Intensity Office	Indoor	2	40%
	Landscape	4	10%
Community/Neighborhood Retail	Indoor	1	40%
	Landscape	4	5%
Regional Retail	Indoor	1	35%
	Landscape	4	5%
Light-Industrial Office	Indoor	2	60%
	Landscape	4	5%
Light Industrial	Indoor	2	60%
	Landscape	4	5%
Heavy Industrial	Indoor	3	45%
	Landscape	4	10%
Public/Quasi-Public	Indoor	1.5	35%
	Landscape	4	15%
Neighborhood Commercial/Office	Indoor	1.5	60%
	Landscape	4	10%
Regional Commercial/Office	Indoor	2	50%
	Landscape	4	10%
Park	Indoor	0.5	5%
	Landscape	4	75%
Schools	Indoor	3	10%
	Landscape	4	50%
Lighting and Landscape	Landscape	4	n/a

The unit demand factors for residential land-use categories are separated by indoor and outdoor use. This was done to accommodate evaluation of conservation opportunities.

In a similar fashion, the non-residential uses were also separated into indoor and landscape unit demands, rather than a traditional value that attempts to blend indoor and outdoor uses together. This was done to accommodate evaluating conservation opportunities, but also to identify opportunities where demands can be met with recycled water supplies (see chapter 7 for more discussion on recycled water supply opportunities). However, in this instance, indoor uses include domestic uses and process water, such as HVAC systems, cafeterias, equipment, and other non domestic uses.

For the non-residential acreage – provided on a “total acres” basis in **Table 4.6** – there is an additional need to identify the percentage of the total acreage for an individual land-use class by indoor or outdoor. For instance, a large retail shopping center only has a small percentage of the property landscaped and a moderate percentage with domestic and process water uses. Therefore, if a retail site is 10 acres only 0.5 acres may be landscaped and only 3 acres may have indoor uses. The remaining 6.5 acres are “hardscapes” such as driveways, parking lots, and delivery alleys. The assumed percentages for the indicated acreage are shown in **Table 4.7** along side the non-residential unit demand factors

High Water Using Industries: As mentioned previously, acreage occupied by Kikkoman, Intel, and Gekkeikan – referred to as high water using industries (HWUI) – was subtracted from the original land use values in order to avoid double-counting water demands, since these demands are estimated separately. **Table 4.8** provides projected demands for these four industrial water users. Values were derived from analysis of historic use, as well as meetings and correspondence with representatives from each company.

Table 4.8					
Projected HWUI Treated Water Demand (acre-feet/year)					
Year	Aerojet	Intel	Kikkoman	Gekkeikan	Total
2005	339	273	130	55	810
2010	373	328	143	67	911
2015	410	383	140	67	1,000
2020	451	383	158	67	1,059
2025	451	383	158	67	1,059

Empire Ranch Golf Course: One golf course – Empire Ranch – exists within the existing service area. As noted previously, the golf course uses some groundwater early in the year, but is otherwise dependant on water supplied by the City. Because records are not kept to separate groundwater supplies from surface supplies, and based on conversations with course

staff and evaluation of their water use, the demand for City water for the course is estimated at 440 acre-feet annually. This accounts for irrigation demands, incidental uses, and domestic needs.

Kaiser Hospital: The City is currently working through the approval process for a new hospital to be located in the Folsom East Service area. Documents provided to the City for this review indicate a potential ultimate demand of as much as 560 acre-feet annually for all hospital process, domestic, and landscape needs. This ultimate demand would not be realized until 2025.

Distribution Loss and Unaccounted for Water: The unit demand factors and the HWUI projected demands do not account for losses that occur in the distribution to these customers, or unaccounted for water supplies, such as fire hydrant flushing, and construction water. To account for these factors in the overall demand requirements, the estimated demands are multiplied by an “unaccounted for water” percentage, which is then added to the projected end-user demand to generate an overall estimate for demand for treated water supplies. The following percentages have been estimated by the City to represent conditions within the various service areas. These values are consistent with the experience of other local purveyors with systems running high pressures¹². Unaccounted for water percentages vary for residential versus non-residential as a result of smaller pipe sizes and material type as well as multitude of fittings at high pressures. Estimated percentages are shown in **Table 4.9**. Percentages between the Folsom West and East service areas also have been found to vary as a result of older developments in the Folsom West Service Area. With anticipated buildout, which will reduce construction water demand, plans for metered billing, and other BMP activities planned by the City, the percentages are expected to decrease over the next 20 years.

Table 4.9	
Unaccounted for Water Percentage	
(as a % of total demand, including unaccounted for water)	
	Folsom Service Area - West
Existing	25%
2025	18%
	Folsom Service Area - East
Existing	24%
2025	17%

Aerojet Raw Water Supplies: As discussed previously, in addition to treated water supplies, Aerojet receives raw water directly from Willow Hill Reservoir. Aerojet envisions

¹² The City has average operating pressures of up to 100 psi in some service areas as a result of the topography of the region.

continued business expansion over time and thus expects to see an increase in the demand for raw water supplies. **Table 4.10** provides the projected raw water demands for Aerojet. In addition to the demand, losses in the transmission of raw water to Aerojet also occur, primarily at Willow Hill Reservoir and in the open, un-lined canal that conveys the water to Aerojet’s facilities. These losses are assumed at 20 percent of the current demand, dropping to 15 percent in the future (as a result of contemplated system improvements).

	2005	2010	2015	2020	2025
Demand	2,731	3,004	3,304	3,634	3,634
Loss	546	451	496	545	545
Total	3,141	3,455	3,800	4,179	4,179

Contractual Obligations: In addition to the total projected raw water demands shown in Table 4.10, the City has a contractual obligation to provide Aerojet up to 5,600 acre-feet of raw water annually, delivered to Aerojet¹³. For purposes of demand projections, this value is labeled *Contractual Obligations*. Subtracting the 2025 projected raw from the obligation (4,179 acre-feet per year), the Contractual Obligation is set at 1,421 acre-feet (raw) in 2025. Since Aerojet demands are projected to increase from today, the reserves are more in the near future, decreasing as Aerojet industrial growth continues into the distant future. This is shown in more detail in **Table 4.12**.

Utility Obligations: In addition to the projected treated water demands for Aerojet as shown in Table 4.8, the City has an obligation to continue to permit owners of lands within the former Southern California Water Company’s Folsom Division to connect to the potable system, if the City can accommodate their requests. For purposes of demand projections, this value is labeled *Utility Obligations*. These obligations are limited by capacity of infrastructure, per the assessment district provisions that provided for their construction. The two assessment district provisions provide for up to 1 million gallons per day (mgd) for the Nimbus Assessment District and 2 mgd for the Folsom South Assessment District. Combined, these represent an obligation of up to 3 mgd, or 3,360 acre-feet per year. In 2025, Aerojet has indicated a potential use of only 450 acre-feet per year of potable demand (for industrial needs). Thus, the City has a remaining potential obligation of up to 2,910 acre-feet per year in 2025. However, the City is only obligated to provide this service up to their availability of supply. Thus, total demands served by the City cannot exceed the 34,000 acre-feet of supply currently available to the City in normal years and Utility Obligations are shown with this constraint in **Table 4.12**.

¹³ The City has entered into agreements with Aerojet for raw water supplies with an expiration date of December 31, 2036.

Total Project Baseline Demands: Final demand projections for the City are presented in **Table 4.11**. Values shown are the summation of the total demand projections presented for Folsom West and East service areas, as depicted in detail in **Table 4.12**. Treated demands include the (1) land-use values in **Table 4.6** multiplied by the associated unit demand factors and indoor/landscape percentages in **Table 4.7**, (2) the HWUI treated water demands, (3) the golf course demand, (4) the hospital demand, (5) the unaccounted for water for the treated distribution system, (6) the Aerojet raw water, (7) the unaccounted for water for the raw water distribution, (8) the Contractual Obligations, (9) the Utility Obligations, and (10) the unaccounted for water to meet the obligations.

Table 4.11				
Total Projected Baseline Demand				
2005	2010	2015	2020	2025
24,994	33,999	33,938	34,000	34,000

**Table 4.12
Total Projected Baseline Demand by Service Area and Demand Segment**

	FSA - West	FSA - East	FSA - West	FSA - East	FSA - West	FSA - East	FSA - West	FSA - East	FSA - West	FSA - East
	Existing (2005)		2010		2015		2020		2025	
Rural Residential (du)	65		68		68		68		68	
Very Low Density (du)	3,854	1,482	4,039	2,003	4,039	2,003	4,039	2,003	4,039	2,003
Low Density Residential (du)	2,807	1,107	2,948	1,496	2,948	1,496	2,948	1,496	2,948	1,496
Medium Density (du)	500	180	605	425	605	425	605	425	605	425
Medium-High Density (du)	652	147	820	369	820	369	820	369	820	369
High Density (du)	105	29	133	72	133	72	133	72	133	72
Total Residential	7,983	2,945	8,612	4,366	8,612	4,366	8,612	4,366	8,612	4,366
Moderate Intensity Office	290	54	394	141	394	141	394	141	394	141
Community/Neighborhood Retail	203	41	276	88	276	88	276	88	276	88
Regional Retail	80	37	108	84	108	84	108	84	108	84
Light-Industrial Office	68	3	92	8	92	8	92	8	92	8
Light Industrial	68	6	92	16	92	16	92	16	92	16
Heavy Industrial	17	4	23	10	23	10	23	10	23	10
Hospital	0	0	0	186	0	560	0	560	0	560
Public/Quasi-Public	76	23	103	59	103	59	103	59	103	59
Neighborhood Commercial/Office	63	15	85	38	85	38	85	38	85	38
Regional Commercial/Office	27	6	37	16	37	16	37	16	37	16
Park	792	860	809	1,059	809	1,059	809	1,059	809	1,059
Schools	717	44	717	162	717	162	717	162	717	162
Lighting and Landscape	600	400	600	440	600	440	600	440	600	440
Total non-residential	3,001	1,493	3,336	2,307	3,336	2,681	3,336	2,681	3,336	2,681
Golf Course		440		440		440		440		440
HWUI Treated Demand	797		911		1,000		1,059		1,059	
Unaccounted (residential)	3,034	1,031	2,584	1,528	2,153	1,091	2,153	1,091	2,153	1,091
Unaccounted (non-residential)	949	484	849	550	650	469	659	469	659	469
Total Treated Water Demand	15,764	6,393	16,292	9,191	15,751	9,047	15,819	9,047	15,819	9,047
Aerojet Raw Water	2,731	--	3,004	--	3,304	--	3,634	--	3,634	--
Unaccounted (raw)	546	--	451	--	496	--	545	--	545	--
Contractual Obligations	--	--	2,145	--	1,800	--	1,421	--	1,421	--
Utility Obligations	--	--	2,430	--	2,950	--	2,945	--	2,945	--
Unaccounted (obligations)	--	--	486	--	590	--	589	--	589	--
Total Demand (by service area)	19,041	6,393	24,808	9,191	24,891	9,047	24,953	9,047	24,953	9,047

4.4 Conservation Measures and Implementation Opportunities

The City is party to many agreements and contracts that require investigation and implementation of water conservation measures, often referred to as best management practices (BMPs). These include:

- ♦ Central Valley Project contract – as a CVP contractor, the City is required to submit a Water Management Plan to the Bureau of Reclamation every five years. The last report was submitted in August 2004 and describes the extent to which the City had implemented a series of Best Management Practices (BMP) intended to conserve water.
- ♦ California Urban Water Conservation Council (CUWCC) – In December 2003, the City signed the CUWCC MOU committing it to implementation and reporting for various BMPs. Since the last round of reporting, the City has yet to complete CUWCC reporting on success and schedule of its BMP implementation program. These BMPs are very similar to those included in Reclamation reports.
- ♦ Water Forum Agreement (WFA) – by signing the WFA, the City agreed to implement cost-effective BMPs that were included in the original WFA. The City, as well as other water purveyor signatories to the WFA, have been implementing these measures and reporting them annually to the Water Forum. Recently, the water purveyors have embarked on phase 1 of a regional Water Conservation Master Plan to provide an opportunity to re-evaluate and, potentially, re-negotiate the BMP requirements in the WFA.

A key component of this phase is to identify and blend BMPs required by the WFA and those required as a CVP contractor or signatory to the CUWCC MOU. Phase 1 is expected to address potential water conservation opportunities, and will be the platform from which new negotiations are entered. Phase 1 is not expected to be complete until early 2006. Also, the actual water savings may change if the city renegotiates their Water Forum water conservation agreement. Phase 2 of the Water Conservation Master Plan will use the results of negotiations to create and implement a City of Folsom specific water conservation master plan.

As a requirement of Water Code Section 10631, the City is required to report on its water conservation programs. Since it has yet to submit a report to the CUWCC, the City is required to address the fourteen (14) demand management measures (DMMs) outlined in the Act. These are very similar to BMPs included under the contracts and agreements mentioned previously. However, since, as mentioned previously, the City is a participant in a regional water conservation master plan, the City may be modifying its water conservation programs based on the results and subsequent WFA negotiations.

4.4.1 Summary of Demand Management Measure Assessments

Water Code Section 10631 requires that an UWMP include a description of the urban water supplier's water demand management measures (DMMs). As discussed throughout this UWMP, demand management is an integral part of the City of Folsom's long term water management strategy. Potential demand management programs are evaluated at the same level of detail as other supply options. In some instances, it may be more cost-effective to implement demand management programs than it would be to secure additional supplies and production/treatment facilities to meet existing and growing demands.

Appendix D summarizes the City of Folsom's following demand management measures as required by Water Code Section 10631:

- ◆ DMM (a) - Water survey programs for single-family and multi-family residential customers
- ◆ DMM (b) - Residential plumbing retrofit
- ◆ DMM (c) - System water audits, leak detection and repair
- ◆ DMM (d) - Commodity rate metering for new connections and retrofit of existing connections
- ◆ DMM (e) - Large landscape conservation programs and incentives
- ◆ DMM (f) - High-efficiency washing machine rebate programs
- ◆ DMM (g) - Public information programs
- ◆ DMM (h) - School education programs
- ◆ DMM (i) - Conservation programs for commercial, industrial, and institutional accounts
- ◆ DMM (j) - Wholesale agency programs
- ◆ DMM (k) - Conservation pricing
- ◆ DMM (l) - Water conservation coordinator
- ◆ DMM (m) - Water waste prohibition
- ◆ DMM (n) - Residential ultra-low-flush toilet replacement

4.4.2 Potential Reduction in Projected Demand from Conservation

Because the City is in the midst of a regional water conservation master plan – intended to identify conservation potential – reasonable assumptions cannot be made as the potential reduction to the demands projected in **Table 4.11**. With installation of water meters, commodity, and conservation-based pricing, and a host of other BMPs, the City could expect to see some reduction in demand from one to ten percent.

However, initial results of the regional master plan are indicating that conservation potential is limited – especially for newer communities, which already have more efficient appliances and fixtures. A recent study from the Bay Area, the Bay Area Water Quality and Reliability Study, is also indicating that per-capita water use remains relatively constant: between 2000 and 2020.

Because of these factors, and because the City wants to plan for worst-case conditions, the assessment of shortages (see chapter 5) use the projected baseline demands shown in **Table 4.11**. Any conservation that may be realized will simply limit the frequency or depth of temporary demand reduction measures, and/or the amount of dry-year water supplies to be transferred or exchanged from other local purveyors. The City’s water management strategy is addressed in more detail in chapter 6.

CHAPTER 5. SUPPLY/DEMAND INTEGRATION

The purpose of this chapter is to integrate the City’s supply and demand projections for purposes of urban water management planning. As noted in Chapter 3, the City has a total water supply of 34,000 acre-feet in normal years. This supply is reduced based on CVP M&I shortage policies and in stages pursuant to the Water Forum Agreement as inflow into Folsom Reservoir drops below 950,000 acre-feet per year.

5.1 Range of Shortfalls

The Water Forum Agreement requires the City to reduce its total diversions from Folsom Reservoir proportionately from 34,000 acre-feet to 30,000 acre-feet under a Stage 1 cutback. The City supply is reduced to only 27,000 acre-feet during a Stage 2 cutback. Under a Stage 3 cutback, the supply is reduced to only 22,000 acre-feet. In the driest years (i.e. conference years), the City has agreed to reduce its supply to 20,000 acre-feet with a potential to reduce supplies as low as 18,000 acre-feet.

In addition to the Water Forum Agreement supply reductions, a portion of the City’s water supply – specifically CVP Fazio supply – is subject to reduction because of Reclamation’s M&I shortage policy. This shortage policy states that in certain undefined year types, Reclamation will cut CVP M&I supplies by 25 percent. Reclamation calculates this supply reduction after assessing a unique baseline: the previous three years average CVP Project Supply use. As such, if the City were to use, on average over a three year period, only 50 percent of its CVP supply, then the CVP reduction would be 25 percent of 50 percent of the Fazio supply. Accordingly, the CVP M&I shortage policy imparts risk to the City’s ability to use all of its Fazio water supply.

Concurrently, the City’s demand is not static, and in fact, will continue to escalate through 2025. As specified in chapter 4, the existing total demand is approximately 22,324 acre-feet. In 2010 – the year residential build-out is expected – demand is projected to be 33,391 acre-feet (including accommodations for contractual and utility obligations, as discussed in chapter 4). As a result of anticipated business expansion by Intel, Aerojet, Kikkoman, and Gekkeikan, the addition of a hospital, and reserves to meet contractual and utility obligations, demand is expected to continue increasing modestly to a 2025 demand of 34,000 acre-feet.

Though 2025 demand in the existing service area is projected to be 34,000 acre-feet annually, the City is evaluating various water supply arrangements within its service area. These arrangements may result in changes to the projected supply deficits, and thus the projected surplus/shortfall. The City is concurrently initiating investigations into additional water supplies to ensure shortfalls to existing areas are not exacerbated (see chapter 6 for details).

Table 5.1 summarizes current and future supply and demand scenarios based on the staged cutbacks in the Water Forum Agreement. The table assumes that when a Water Forum

Agreement Stage 2 event occurs, supply conditions in Folsom Lake will also trigger severe CVP cutbacks such that the combination of pre-1914 water rights and available CVP supplies will not exceed the diversion allocation as directed under the Water Forum Agreement.

Accordingly, based on existing supply scenarios, the City will be forced to reduce demand through temporary demand reduction measures in certain year types unless a replacement supply can be found. The Water Forum Agreement allows the City to seek replacement supplies from neighboring water purveyors. The City’s strategy to manage water supplies and demands to minimize the impact of dry conditions are explained further in Chapter 6.

Year Type	WFA¹⁴ Water Supply	CVP M&I Shortage Supply	Current Demand	2010 Demand	2025 Demand	Potential 2025 Surplus/Shortfall in Existing Service Areas
Normal	34,000	32,250 ¹⁵	22,324	33,391	34,000	0 to (1,750)
Stage 1	30,000	30,000	22,324	33,391	34,000	(4,000)
Stage 2	27,000	27,000 ¹⁶	22,324	33,391	34,000	(7,000)
Stage 3	22,000	22,000	22,324	33,391	34,000	(12,000)
Driest Year	20,000	20,000	22,324	33,391	34,000	(14,000)
Conference	18,000	18,000	22,324	33,391	34,000	(16,000)

Note: The potential surplus/shortfall is relative to projected demands and supplies associated with existing service areas.

5.2 Drought Scenarios

The Water Forum Agreement provides the hydrological framework for determining drought conditions for the City of Folsom. As described above, the dry year conditions are based upon total measured inflow into Folsom Reservoir. When inflows into Folsom Reservoir drop below 950,000 acre-feet the staged surface diversion cutbacks are triggered and the City is obligated to reduce surface water diversions. The probability of inflows into Folsom Reservoir dropping below 950,000 acre-feet is depicted in **Figure 5.1**.

5.2.1 Single Year Drought

The City is developing single year drought contingency plans. Based on the Water Forum Agreement, the City’s total surface water diversions could be reduced from 34,000 acre-feet to 18,000 acre-feet in any single year. As such, the City is developing plans to preclude crisis conditions should inflow into Folsom Reservoir drop below 400,000 acre-feet, limiting surface water diversions to 18,000 acre-feet.

¹⁴ Water Forum Agreement

¹⁵ For purposes of this calculation, we assume that the City is diverting and using its entire CVP Project Supply allotment whenever possible.

¹⁶ This calculation assumes that the City decides not to use any portion of its CVP Fazio water supply to meet demand when subjected to the staged Water Forum diversion cutbacks.

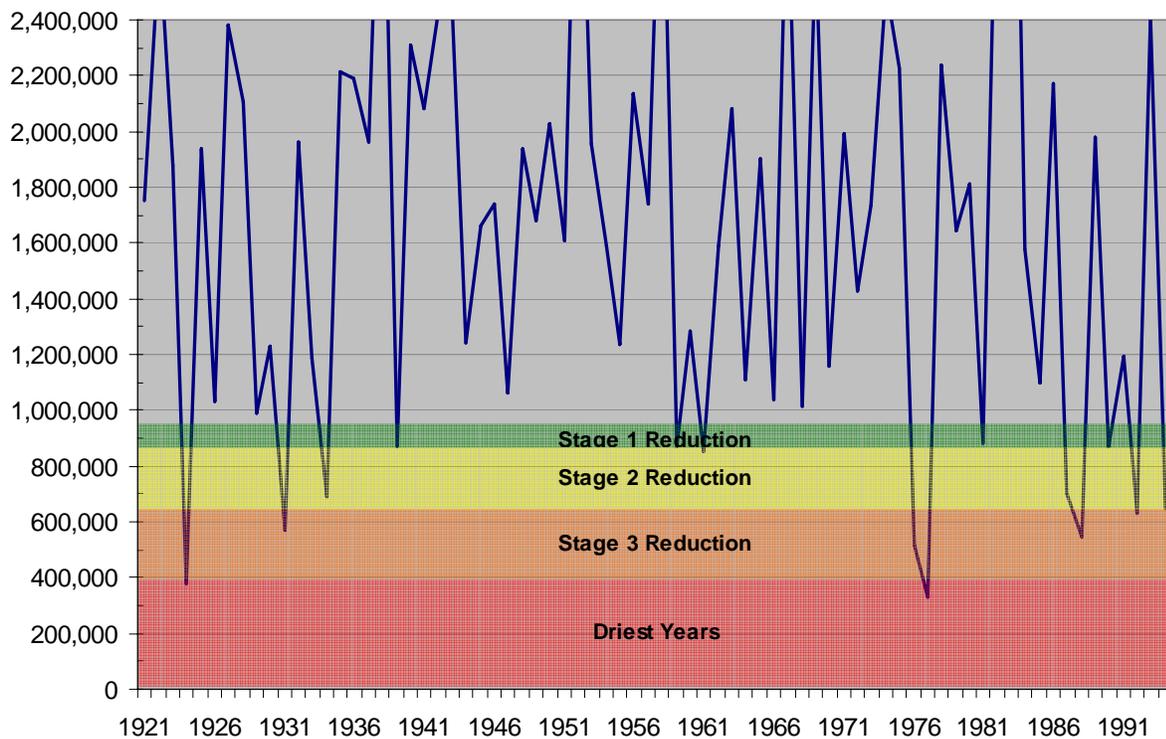


Figure 5.1: Representative Frequency of Unimpaired Folsom Reservoir Inflow

The City’s plans include utilizing demand management measures as described in section 6.3.1 below coupled with supply augmentation measures. The City is working on supply augmentations measures that will parallel its expected growth patterns. These augmentation measures are more fully described in Chapter 6.

5.2.2 Multiple Year Drought

Similarly, the City is planning for multiple critically dry years where the inflow into Folsom Reservoir repeatedly drops below 400,000 acre-feet and the City has multiple years of 18,000 acre-feet of surface water diversions. In either of these two scenarios, the City will rely on a combination of voluntary demand management measures, the City’s Water Conservation regulations, regional coordination coupled with drought emergency planning efforts, and planned supply augmentation.

CHAPTER 6. WATER MANAGEMENT STRATEGY

A comprehensive strategy to flexibly manage water supplies and demands is the City's near-term goal. The City is currently in the midst of several activities to bring this goal to fruition, including continuing to (1) assess and implement internal water management actions, and (2) pursue arrangements with other regional purveyors, as allowed for in the Water Forum Agreement. The following provides an overview of critical elements of the City's strategy.

6.1 Internal Water Management Actions

As stated in the Water Forum Agreement, Folsom is moving forward with "imposing additional conservation levels" in its existing service area (WFA at 178). Specifically, Folsom is implementing the following:

- ◆ Meter installation and associated rates based on volume of use;
- ◆ BMPs, collectively including those identified in the WFA or as will be defined in the Water Forum Successor Effort, those identified by the Reclamation Reform Act for CVP contractors, those identified by the CUWCC for signatories, and those identified by DWR as part of UWMP reporting;
- ◆ Revisions to the water shortage contingency provisions that trigger short-term demand reduction measures; and
- ◆ Development-specific requirements such as those for landscape design and installation, or for industrial applications.

In addition, as detailed in chapter 7, Folsom is investigating opportunities for importing recycled water from El Dorado Irrigation District and/or Sacramento Regional County Sanitation District, where the City's wastewater currently flows.

6.2 Replacement Supplies from Partnering Water Purveyors

Although local demand management and importation of recycled water are a critical elements of a water management strategy, these measures alone will not provide dry year supply reliability when the Water Forum Agreement triggers diversion restrictions. Managing dry-year reliability objectives will include implementing a combination of supply augmentation and demand management measures.

6.2.1 Water Forum Agreement Provision

The Water Forum Agreement signed by the City included a key provision that, in consideration for its reduction in diversion and use of its surface water entitlements from Folsom Reservoir and the American River, "Folsom will enter into agreements with other purveyors that have access to both surface water and groundwater for an equivalent

exchange of the amount of reduction needed by Folsom as outlined above in the 3 stages of reduction.” (WFA at 178).

The City seeks to develop these arrangements with regional water purveyors as it fulfills its obligation to reduce diversions in certain year types under the Water Forum Agreement. All signatories to the Water Forum Agreement have, among other things, agreed to assist each other in meeting supply reliability objectives.

The City is in the midst of developing a comprehensive water management strategy that, among other elements, includes identifying and evaluating opportunities with other local purveyors. This strategy is based on the negotiated terms of the Water Forum Agreement and is consistent with the two co-equal objectives of the Water Forum Agreement. Two primary opportunities have been identified to date:

- Transfer based on Demand Modification and Local Recycling
- Transfer based on Replacement Agreements

6.2.2 Transfer based on Demand Modification and Local Recycling

Under this concept, the City would work with regional water purveyors to identify American River surface water supplies that may be available for transfer. This purchase would include developing all necessary conveyance improvements to divert these supplies and implementing all necessary demand management measures. These supplies could be derived from:

- Assessing the availability of water supplies that may exceed a purveyor’s long-term projected demands;
- Evaluating the timing and extent of regional water demand realization; and
- Identifying possible water conservation and local recycling opportunities that exceed those planned by the participating agency to satisfy its reliability goals.

6.2.3 Transfer based on Replacement Arrangements

Under this concept, the City would purchase American River surface water supplies from participating agencies and pay for replacement surface water or groundwater supplies for participating agencies. This purchase would include developing all necessary conveyance improvements to divert these supplies, as well as paying for all necessary conveyance, pumping, and replacement water supplies. Replacement supplies could be derived from any individual or combination of:

- Groundwater – this replacement supply could be developed through passive or active groundwater management projects.

- Surface Water Supply Pooling – this replacement supply could be developed as part of a regional collaboration.
- Import Supplies – this replacement supply depends upon the ability to secure the water supply and deliver this supply to participating agencies.
- Sacramento Regional County Sanitation District Imported Recycled Supplies – this replacement supply requires integrating proposed regional facilities with framework participants.

6.2.4 Screening Replacement Supply Opportunities

Folsom will undertake a two-step screening process to work through the viability of the various alternatives. The first step in this screening is to assess the willingness of participating agencies to move ahead with investigations of the alternatives that are presented and to assess the conceptual viability of each. The second step will involve in-depth analyses of the technical, legal, political, and economic feasibility of some of the alternatives based on their rating of participating agency willingness and relative potential viability. As this process progresses, the alternatives will be screened against several specific criteria. This effort will result in a preferred alternative.

6.3 Temporary Demand Reduction

In 1992, the City passed a resolution adopting a Water Shortage Contingency Plan (Plan). The Plan was designed to help the City implement Municipal Code Chapter 13.26, which was adopted in 1991. The municipal code provides the City Manager discretion to impose mandatory water conservation provisions upon “all customers using water both in and outside the city, regardless of whether any customer using water shall have a contract for water service with the city.” The regulations outline five successively more stringent conservation stages, any one of which may be imposed given supply conditions at a given point in time. The regulations also include penalty provisions, including verbal and written notification, fines, and mandatory water meter installations.

The Plan includes an assessment of penalties, fiscal impacts, and monitoring mechanisms. The entire Plan, including the staged reductions, is included in **Appendix E**. The City is comparing the Plan demand reduction stages with the supply reduction stages contained in the Water Forum Agreement to determine the extent to which the City can rely upon the various demand reduction stages under given Agreement cutbacks.

Implementation and enforcement of Stages 1-5 are likely to have a progressively greater direct and indirect financial impact on the City. To the extent that existing water conservation staff focus a greater share of their time on compliance and enforcement tasks and other city staff are recruited to help with similar tasks, there are direct costs. The City also faces a direct financial impact if it is necessary to install a meter as a result of a violation as specified in Chapter 13.26.06 of the Municipal Code. As the scope of

the effort increases and staff are diverted from their primary duties, there will be indirect impacts on other city services.

6.3.1 Temporary Demand Reduction Stages

The City Municipal Code Chapter 13.26 includes the following five temporary demand reduction stages:

- ◆ Stage 1: *Normal Water Supply* – Stage 1 requires water to be put to beneficial use and prohibits wasteful uses of water; requires water to be confined to the customer’s property; prohibits free-flowing hoses or filling apparatus; requires leaking infrastructure to be repaired in at least five days; requires recirculation devices on pools, ponds and artificial lakes.
- ◆ Stage 2: *Water Alert* – Stage 2 incorporates all of the provisions of Stage 1, and: limits landscape and pasture irrigation to 3 days per week according to an odd/even address schedule, allows automatic sprinkling only during off-peak hours; prohibits street and driveway washing; requires restaurants to only serve water upon request; requires manual watering on an odd/even schedule; requires medians to be watered only on odd/even schedule.
- ◆ Stage 3: *Water Warning* – Stage 3 incorporates all of the provisions of Stage 2, and further limits landscape and pasture irrigation to only 2 days per week according to an odd/even address schedule. The 2 day, odd/even schedule also applies to manual and median watering.
- ◆ Stage 4: *Water Crisis* – Stage 4 incorporates all of the provisions of Stage 3, and further limits landscape and pasture irrigation to only 1 day per week according to an odd/even address schedule. The 1 day, odd/even schedule also applies to manual and median watering. Stage 4 also prohibits filling or refilling pools and ponds; prohibits water use for ornamental ponds and fountains; requires car and equipment washing to be done on the lawn or at a commercial establishment that uses recycled or reclaimed water; prohibits water use for construction purposes, including dust control and compaction.
- ◆ Stage 5: *Water Emergency* – Stage 5 incorporates all of the provisions of Stage 4, and prohibits all landscape and pasture irrigation; prohibits sewer and fire hydrant flushing except for emergencies; requires car and equipment washing to be done only at a commercial establishment that uses recycled or reclaimed water.

Municipal Code Section 13.26.06 has specific penalty provisions for violations under Stages 1-5.

The City has a Water Shortage Contingency Plan that couples these cutbacks provisions with water supply conditions. In short, a Stage 1 in the Municipal Code equates to 100% supply; Stage 2 equates to 85% supply; Stage 3 equates to 75% supply; Stage 4 equates to 65% supply; and Stage 5 equates to 50% supply. The City is in the process of updating this plan to meet future supply and demand conditions.

6.3.2 Tracking Potential Water Savings

The City will use Folsom WTP production figures as well as delivery figures to track reduction quantities associated with implementation of the various temporary demand reduction stages described in sub-chapter 6.3.1.

6.3.3 Catastrophic Outage

As described in chapter 2, the City relies on water diverted from Folsom Lake through a facility jointly used by the City of Folsom, the City of Roseville, San Juan Water District, and the California Department of Corrections. This sole point of delivery leaves the City vulnerable to a catastrophic outage that could interrupt the delivery of supplies to the City's water treatment plant. The City is actively working on measures to improve the redundancy of this point and other points of delivery, including:

- ◆ Joint negotiations with Reclamation regarding needed redundancy improvements at the Folsom Dam outlet facility
- ◆ Investigations of potential interconnections with El Dorado Irrigation District
- ◆ A new pipeline across the American River to accommodate interconnection with San Juan Water District (in association with the new bridge proposed to mitigate for the closure of the Folsom Dam road).

6.4 Recycled Water Opportunities

Chapter 7 outlines the potential recycled water opportunities that the City is evaluating, and to the extent the information is available, provides estimates of potential recycled water supplies. The City is committed to evaluating the use of recycled water as a critical element of its long-term water management strategy.

CHAPTER 7. RECYCLED WATER PLAN

Water Code Section 10633 requires an UWMP “to provide, to the extent available, information on recycled water and its potential for use as a water source in the service area of the urban water supplier.”

7.1 Approach

The City is exploring the option of using recycled water in the Folsom Service Area – East service zone, because the relatively more recent construction lends itself to cost-effective engineering solutions, as well as the proximity of this area to the El Dorado Irrigation District Service area and major wastewater conveyance systems operated by the Sacramento Regional County Sanitation District.

A recent evaluation of recycled water use potential in Folsom Service Area – East resulted in a range of alternatives based upon the scope of recycled water use applications and the extent of the infrastructure required. The evaluation yielded the following three scenarios: 1) minimum, 2) moderate, and 3) maximum landscape use.

- ♦ *Minimal landscape use.* This alternative is limited to irrigating the landscaping at schools, parks, and roadway medians with recycled water. Targeting these uses allows large irrigation demands to be removed from the potable water. Depending on the locations of these uses, infrastructure to serve them may be limited to main roadways with turnouts to each major irrigation meter. Demand is seasonal, peaking in the summer and early fall, with almost no demand in winter and early spring months.
- ♦ *Moderate landscape use.* This alternative starts with the Minimal Landscape Use scenario and adds landscaping at commercial and industrial properties. The economic feasibility of serving the existing commercial and industrial landscapes depends partly on how existing irrigation systems are plumbed in relation to other potable demands at each property.
- ♦ *Maximum landscape use.* This scenario assumes use of recycled water for all potential landscape demands described in Minimum and Moderate scenarios above, and adds commercial/industrial property process water. (Process water may be used for car washes, laundry facilities, cooling at large facilities (i.e. regional mall, medical buildings), nurseries, and hospital use (i.e. new Kaiser campus).
- ♦ *Empire Ranch Golf Course.* Recycled water use at the Empire Ranch Golf Course is being evaluated as a potential addition to each of these scenarios. The golf course is already plumbed to use recycled water. The

golf course is located at the potential Northern end of the recycled water service area, thus would require extensive piping. However, the pipeline could be routed to concurrently serve schools, parks and medians (or other potential customers).

Approximate dry-year demand under the Minimum Landscape Use scenario is 1,000-1,500 acre-feet (including the Empire Ranch Golf Course). Demand estimates for the Moderate and Maximum Use scenarios in dry years range from approximately 2,000-5,000 acre-feet. While the Moderate Use scenario may be financially feasible, the Maximum Use scenario is almost certainly cost-prohibitive because it assumes a certain degree of single-family home retrofitting for distribution of recycled water.

7.2 Currently Identified Opportunities

The City of Folsom is currently identifying potential sources of recycled water supplies. Specifically, the City is working with regional agencies to determine how to best utilize potential recycled supplies for regional benefit. These opportunities may include the El Dorado Irrigation District (EID) and/or Sacramento Regional County Sanitation District (SRCSD).

7.2.1 El Dorado Irrigation District

The El Dorado Irrigation District (EID) distributes recycled water to golf courses, landscaping, highway medians, and over 1600 dual-plumbed homes. Previous studies have determined that EID has almost 1,900 acre-feet per year of excess recycled water available, with this excess increasing to over 5,300 acre-feet per year by 2017. EID is evaluating the potential benefit of expanding its current recycling program, and is considering providing recycled water to adjacent water suppliers, such as the City, that may have an interest in cost-sharing for new infrastructure, including a reservoir for seasonal storage of excess recycled water generated by EID. These discussions are just beginning and, therefore, no details are available to report in this UWMP Update.

The City will need to further analyze the availability of this supply and the feasibility of storage and delivery.

7.2.2 Sacramento Regional County Sanitation District

The Sacramento Regional County Sanitation District (SRCSD) provides wastewater treatment and large pipeline conveyance from three contributing agencies, including the City. SRCSD currently recycles 3 million-gallons of wastewater per-day (mgd) at its regional treatment plant in Elk Grove, and serves proximate large volume irrigation customers. SRCSD is looking to expand its current water recycling program, including expansion of the recycling volume at the current facility, developing water recycling opportunities within SRCSD's service area, investigating uses of recycled water for traditional landscape uses, and determining the most logical place to treat and supply

communities with recycled water. SRCSD anticipates releasing a draft water recycling master plan in early 2006.

Since the cost of conveying recycled water from the SRCSD recycling plant in Elk Grove to the City service area is cost prohibitive, SRCSD is evaluating the potential benefits of a wastewater “scalping plants” throughout its service area. A “scalping” plant is a small wastewater treatment facility located within a sewer collection system that treats a portion of the available wastewater flow to water reuse standards then distributes the wastewater to a local reuse customer (e.g. a golf course). The SRCSD is developing a Regional Water Recycling Master Plan to evaluate this and other regional recycling opportunities. This Plan is in its early stages, and, therefore, no details are available to report in this UWMP Update.

The water recycled from a scalping plant located near the City could be applied according to one of the three scenarios under chapter 7.1.

APPENDICES

APPENDIX A – PUBLIC OUTREACH INFORMATION

CITY OF FOLSOM
Utilities Department
50 Natoma Street
Folsom, California 95630



Kenneth V. Payne, P.E.
Director

Walter E. Sadler, P.E.
Assistant Director

2005-09-30 5:05 PM 1:06

FOR THE
SACRAMENTO COUNTY
WATER RESOURCES
AGENCY

September 30, 2005

Mr. Herb Neiderberger
Sacramento County Water Agency
827 7th St. Room 301
Sacramento, CA 95814

RE: CITY OF FOLSOM 2005 URBAN WATER MANAGEMENT PLAN UPDATE

Dear Mr. Neiderberger:

This letter is to inform you that the City of Folsom is currently preparing a 2005 Urban Water Management Plan (UWMP) Update. The Update, required by the Urban Water Management Planning Act (Water Code Section 10610), describes and evaluates sources of water supply, efficient uses of water and demand management measures, as well as describes program implementation strategies and schedules. This effort helps ensure we can provide our customers a reliable, high-quality supply of water, now and into the future.

Developing the 2005 UWMP update is a critical element of the City's on-going water management planning and implementation efforts. You may have received this notification because the City believes (1) information contained in the report will need to be coordinated with your agency, or (2) it is important that you know the City is undertaking these water management planning activities. The City has contracted with Tully & Young to complete the update, which must be adopted by the City and submitted to the California Department of Water Resources by December 31, 2005. If it is important to coordinate with your agency, you may be contacted by City staff or Tully & Young to obtain relevant information or data.

A draft of the 2005 UWMP Update will be available for review prior to adoption by the City in December. Please contact us if you would like to have a draft sent to you. If you have any questions or comments about this effort, please contact Todd Eising at 916-351-3502.

Sincerely,

A handwritten signature in black ink that reads "Kenneth V. Payne".

Kenneth V. Payne, P.E.
Director of Utilities
City of Folsom

Telephone (916) 355-7272 / Fax (916) 351-5603



The following individuals were notified via a letter signed by Public Utilities Director, Ken Payne, regarding the preparation of this Urban Water Management Plan:

- ◆ County of Sacramento – Roberta MacGlashan, District 4 Supervisor
700 H Street, Suite 2450, Sacramento CA 95814
- ◆ Regional Water Authority – Ed Winkler, Executive Director
- ◆ San Juan Water District – Shauna Lorance, General Manager
- ◆ Fair Oaks Water District – Tom Gray, General Manager
- ◆ Sacramento County Water Agency – Herb Niederberger
- ◆ Citrus Heights Water District - Robert Churchill, General Manager
- ◆ El Dorado Irrigation District - Ane Deister, General Manager
- ◆ El Dorado County Water Agency - William Hetland, General Manager
- ◆ Orange Vale Water Company - Sharon Wilcox, General Manager
- ◆ Placer County Water Agency - David Breninger, General Manager
- ◆ Sacramento Suburban Water District - Robert Roscoe, General Manager
- ◆ City of Roseville – Derrick Whitehead, Environmental Utility Director
- ◆ Southern California Water Company - Paul Schubert, District Manager

APPENDIX B – CITY COUNCIL ADOPTION INFORMATION

RESOLUTION NO. 7753

**A RESOLUTION ADOPTING THE 2005 URBAN WATER
MANAGEMENT PLAN AND AUTHORIZING SUBMITTAL
TO THE CALIFORNIA DEPARTMENT OF WATER RESOURCES**

WHEREAS, the City of Folsom is an urban water supplier providing water for municipal purposes to more than 20,000 customers; and,

WHEREAS, the Urban Water Management Planning Act requires every urban water supplier providing water for municipal purposes to more than 3,000 customers to adopt and submit a Urban Water Management Plan to the California Department of Water Resources every five years; and,

WHEREAS, the City of Folsom wishes to comply with California Water Code Section 10610 regarding the preparation of an Urban Water Management Plan; and,

WHEREAS, the City of Folsom has prepared the required plan, published a Notice of Public Hearing pursuant to California Government Code 6065, published March 15, 2006, and March 22, 2006, and held the appropriate Public Hearing;

NOW, THEREFORE, BE IT RESOLVED that the City Council of the City of Folsom adopts the 2005 Urban Water Management Plan and authorizes the Utilities Director to submit the plan to the California Department of Water Resources.

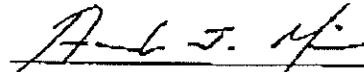
PASSED AND ADOPTED on this 28th day of March 2006, by the following roll-call vote:

AYES: Council Member(s): Miklos, Starsky, Howell, King, Morin

NOES: Council Member(s): None

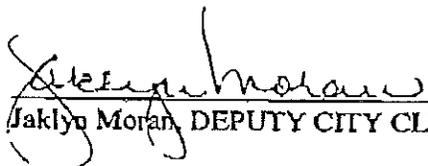
ABSENT: Council Member(s): None

ABSTAIN: Council Member(s): None



Andrew J. Morin, MAYOR

ATTEST:



Jaklyn Moran, DEPUTY CITY CLERK

Resolution No. 7753
Page 1 of 1

The foregoing instrument is a correct copy
of the original on file in this office.

ATTEST: 

Asst. City Clerk of the City of Folsom, California

DATE: April 3, 2006

TO: Mayor and City Council Members

FROM: Utilities Department

SUBJECT: **RESOLUTION NO. 7753 - A RESOLUTION ADOPTING THE 2005 URBAN WATER MANAGEMENT PLAN AND AUTHORIZING SUBMITTAL TO CALIFORNIA DEPARTMENT OF WATER RESOURCES**

BACKGROUND / ISSUE

The California Water Code (CWC) requires all urban water suppliers, public and private, which serve water to more than 3,000 customers or supply more than 3,000 acre-feet of water annually to prepare and adopt an Urban Water Management Plan (UWMP). The CWC also requires water suppliers to adopt the UWMP's every five years and to address only the area within the current jurisdictional boundaries of the water supplier. The California Department of Water Resources (DWR) requires that water suppliers adopt UWMP's to maintain eligibility for state grants, loans and drought assistance programs, which allowed the City to receive the maximum of AB303, Groundwater Study, funding for \$250,000 in 2004/05.

The City previously adopted its 2000 UWMP on February 21, 2001. With the completion of the required public hearing and adoption of the 2005 UWMP by the City Council, the City would remain in compliance with state law.

The adoption of the 2005 UWMP is a regulatory requirement by the California Department of Water Resources. This plan is independent of the City's Water Supply Management efforts. The water supply efforts are currently in progress and include planning for dry-year water supplies and additional water supplies for the Sphere of Influence (SOI) area. This effort will be presented to the City Council as a separate item once a water supply plan is completed.

POLICY / RULE

In accordance with the CWC, the City is required to adopt and submit an Urban Water Management Plan to the California Department of Water Resources every five years.

ANALYSIS

As required by the CWC, the City's UWMP contains an assessment of current and projected supplies, an evolution of the reliability of these supplies given a range of hydrologic conditions, an assessment of demands by customer type, and a generalized explanation of water management strategies designed to integrate supply and demand conditions.

The purpose of this UWMP is to document the City's water supply planning strategies for the existing municipal jurisdiction. This UWMP is not intended to incorporate water planning elements related to the City's sphere of influence (SOI) or other potential areas of expanded

water service. As the City completes the development of a comprehensive water management strategy to address potential expanded service, the City will review and adopt changes to this plan, as required by the CWC.

A copy of the 2005 UWMP is attached, as well as an outline of the document. A copy of the UWMP is available for review by the public by contacting the Utilities Department or City Clerk's office.

FINANCIAL IMPACT

There is no financial impact above the cost to prepare the UWMP.

ENVIRONMENTAL REVIEW

In accordance with the Guidelines for California Environmental Quality Act, Article 19, Section 15306, adoption of the Urban Water Management Plan is Categorically Exempt since it consists of basic data collection, research, and resource evaluation activities that do not result in a serious or major disturbance to an environmental resource.

ATTACHMENT

1. Resolution No. 7753 – A Resolution Adopting the 2005 Urban Water Management Plan and Authorizing Submittal to California Department of Water Resources
2. Outline of 2005 Urban Water Management Plan
3. 2005 Urban Water Management Plan
4. Resolution No. 6447 Adopting the 2000 Urban Water Management Plan and Authorizing Submittal to the California Department of Water Resources.

RECOMMENDATION/ CITY COUNCIL ACTION

The Utilities Department recommends that the City adopt the 2005 Urban Water Management Plan and authorize submittal to the California Department of Water Resources.

Submitted,

Kenneth V. Payne, UTILITIES DIRECTOR

APPENDIX C – HISTORICAL AND PROJECTED POPULATION

Appendix C – Historical and Projected Population

Population estimates were made using a variety of data from federal, state, and local sources. Both historical data and future projections were used for analysis, with linear interpolation for incremental time periods between defined years. For example, interpolations were made between 2000 U.S. Census data and projections for build-out population assumed to occur in 2009.

The various data sources were compared and evaluated for their applicability under the demand analysis, so that the appropriate population projection served as the basis for predicting future water demands. The population information derived below is summarized in Section 2.2 of the 2005 UWMP Update.

C.1 U.S. Census Bureau Historical Population Estimates

The U.S. Census Bureau conducts census surveys every ten years for the entire country, asking questions on household size, ethnicity, housing units, and other demographic statistics. The Census Bureau data provide detailed information for regions as small as Census blocks¹⁷. Historical data from the 1990 and 2000 censuses were used as a basis for the City population estimates. Figure 6 shows how the City was divided into Census blocks for the 2000 Census and how the Census blocks fit within the previously defined service area boundaries.

A GIS-based map of the Census Blocks was used in conjunction with the map delineating the four service areas to estimate population within each region. While most Census blocks for the City fell completely within one of the respective service areas, a few were split between two. For these instances, a rough estimate was made of the percentage of Census block area within each service area, and the total Census block population was split according to this percentage. This method is an approximation, and assumes uniform population density across Census blocks. Because of the small number of Census blocks requiring bisection, any error associated with the approximation should be relatively small.

Because of difficulty in obtaining Census block information from the 1990 Census, only estimates for the North Area combined (Ashland and American River Canyon together) and the South Area combined (both FSA – East and FSA – West) were completed. These

¹⁷ A Census block is the smallest geographic unit for which the Census Bureau tabulates statistical data. Census blocks often correspond to individual city blocks, bounded by streets, but some Census blocks – especially those in rural areas – may encompass many square miles and contain boundaries that are not streets.

estimates were made using the more readily available Census Tract¹⁸ data from the U.S. Census Bureau.

The resulting population estimates are shown in **Table C.1**.

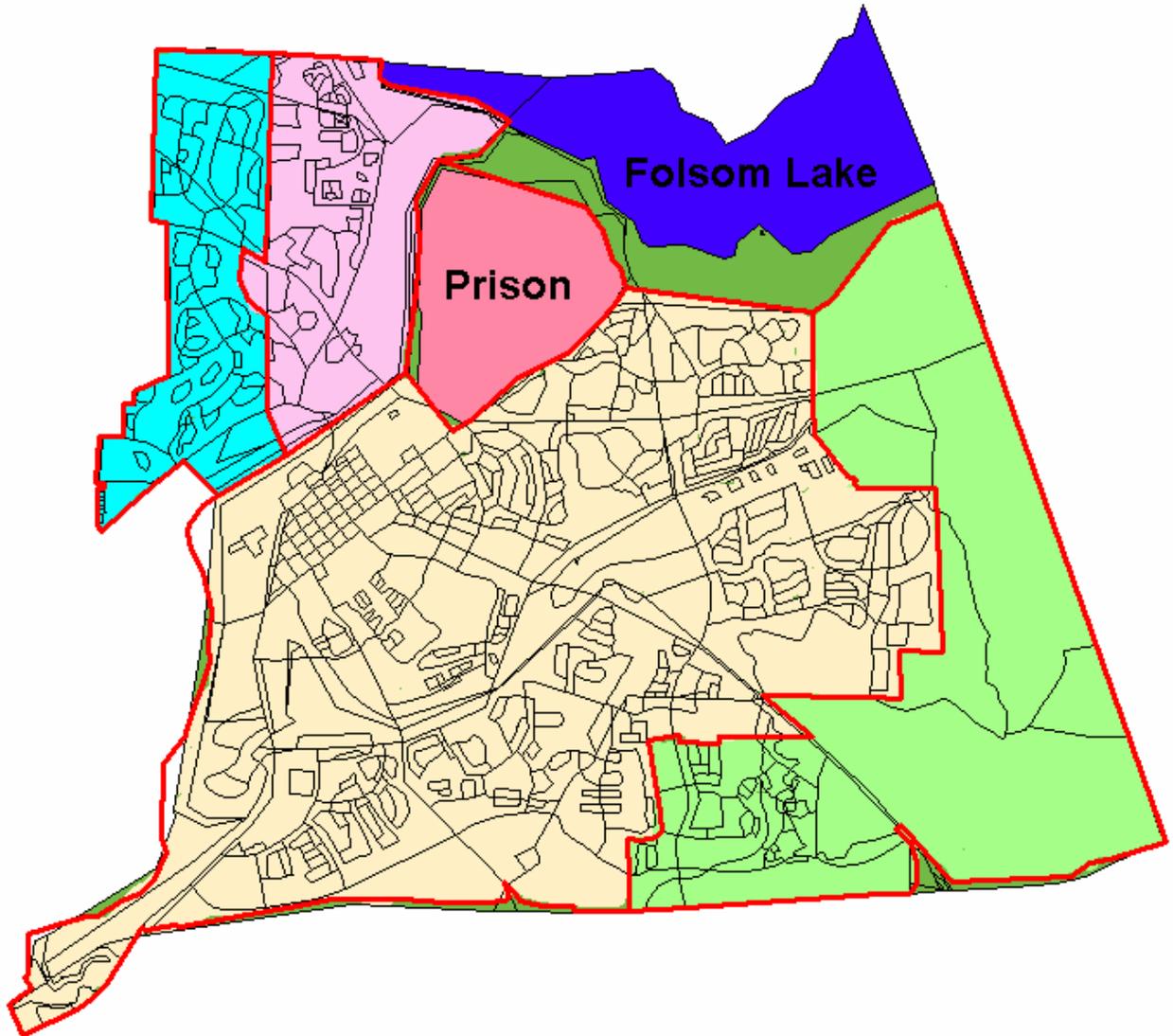


Figure C.1: Folsom 2000 Census Blocks and Water Service Area Boundaries

¹⁸ Census Tract data is a compilation of Census Block data that has already been organized into designated “blocks” by the Census Bureau.

Census Year	All Folsom	Prison¹⁹	FSA - East	FSA – West (w/o Prison)²⁰	Ashland	American River Canyon
1990	29,802	6,563	15,306 (combined)		7,933 (combined)	
2000	51,884	6,883	3,438	32,689	4,030	4,844

Other information taken from the 2000 Census data included the following items:

- ◆ The number of vacant housing units
- ◆ The number of occupied housing units
- ◆ The number of people living in occupied housing units
- ◆ A breakdown of the occupied housing unit number and population data between owner occupied and renter occupied units.

This information, shown in **Table C.2**, was used for the land use-based population projections described later in this document.

Service Area	Vacant Units	Occupied Units	Population in Occupied Units
FSA – West	507	12,047	32,551
Owner Occupied		9,131	25,927
Renter Occupied		2,916	6,624
FSA – East	126	1,239	3,438
Owner Occupied		1,030	2,916
Renter Occupied		209	522
Ashland	69	2,002	4,030
Owner Occupied		1,518	3,168
Renter Occupied		484	862
American River Canyon	68	1,872	4,844
Owner Occupied		1,444	4,051
Renter Occupied		428	793

¹⁹ Population of Folsom State Prison and California State Prison-Sacramento are from the California Department of Finance (CDOF).

²⁰ U.S. Census prison populations differ slightly from CDOF estimates. Since the CDOF estimates are considered more reliable and more representative of the population served by the Prison’s water treatment plant, they were used instead of the Census data.

As with the other population estimates, housing and population counts for Census blocks split between two service areas were divided according to the proportion of Census block area within either service area.

For the vacant unit numbers, additional information was available from the U.S. Census Bureau. Vacant units were subdivided into the following six classifications:

1. For rent
2. For sale only
3. Rented or sold, not occupied
4. For seasonal, recreational, or occasional use
5. For migrant workers
6. Other vacant

Because the vacancy numbers are important for deriving population estimates based on single-family and multi-family units, as described later, data for several of these classifications were recorded. This information, along with a new classification counting the remaining vacant units (the sum of categories 3 and 6 listed above), is shown in **Table C.3**.

Table C.3				
2000 Census Vacant Unit Data				
Unit Type	FSA - West	FSA - East	American River Canyon	Ashland
Total Vacant Units	507	126	68	69
For Rent	216	24	32	39
For Sale Only	117	68	13	16
For Seasonal, Recreational or Occasional Use	49	5	10	5
For Migrant Workers	0	0	0	0
Remaining Vacant	125	29	13	9

C.2 Department of Finance Historical Population Estimates

The California Department of Finance (CDOF) prepares annual estimates of population for cities and counties across the state. These estimates are compiled in a variety of reports that are regularly updated, and are used to establish appropriation limitations, distribute funds, and for planning purposes. Since the data are only on a county- or city-wide level, estimates for the individual service areas cannot be directly obtained from the Department of Finance estimates.

The annual city population estimates are derived by CDOF using the Housing Unit (HU) Method, which estimates total and occupied housing units, the average size of households, household population, and population within group quarters. U.S. Census Bureau data and county demographic statistics are also used to develop the city estimates.

CDOF also compiles data on many types of group quarters facilities, including the prison grounds at the City. Population estimates for three facilities in particular were recorded for the City: Folsom State Prison, California State Prison – Sacramento, and the Return to Custody facility (Community Correctional facility). Through conversations with the City, it was determined that the Return to Custody facility obtained water supplies from the Folsom WTP, while the other two facilities used the prison’s water treatment plant. As a result, for purposes of the demand study, only the Return to Custody facility population was included in the component City population served by the Folsom WTP. The Return to Custody facility was recently closed, making the population derivation more straightforward. **Figure C.2** shows the historical populations for the three correctional facilities in the City for the 1990 to 2004 period. A smoothed line interpolation was used between data points. As shown in the graph, the population for the two correctional facilities served by the prison’s own water treatment plant has remained close to 7,000 over the 1990 to 2004 period of record.

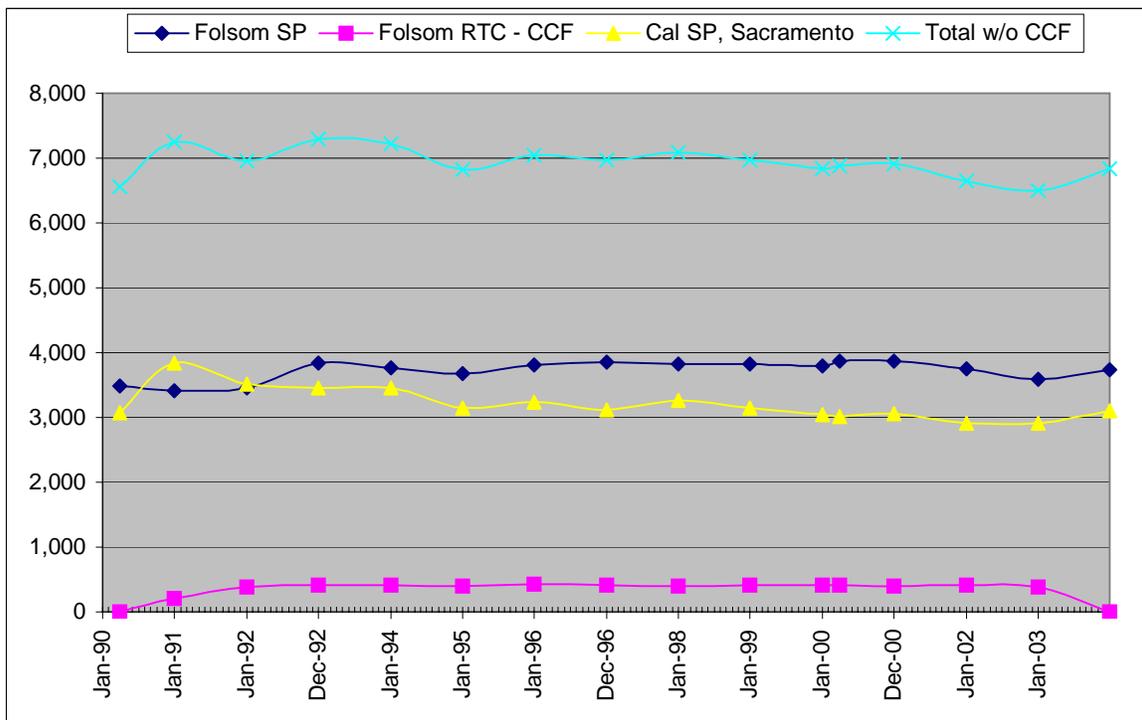


Figure C.2: Population of City of Folsom Correctional Facilities

CDOF also produces future population projections for all counties in the state, which are less useful for the City projections since the City portion cannot be easily derived. Because of this limitation, the county projections were not used.

C.3 SACOG Population Projections

The Sacramento Area Council of Governments (SACOG) produces past and future estimates of population for census tracts, minor zones, regional analysis districts (RADs), and local jurisdictions in the Sacramento area. SACOG uses Census Bureau information along with CDOF reports and data provided by local governments to derive its estimates. **Table C.4** shows SACOG estimates and predictions for City population, along with estimates of housing units for certain years in the 1990 to 2025 period. The 1990 to 2001 data are from a 2002 report (SACOG, 2002), while the future projections are from a 2001 SACOG document (SACOG, 2001).

Year	Total Folsom Population	Group Quarters Population	Household Population	Housing Units
1990	29,600	6,720	22,880	6,147
1995	39,800	7,179	32,621	9,716
2000	51,300	7,141	44,159	13,414
2001	57,200	7,141	50,059	14,401
2005	62,900	7,169	55,731	22,033
2010	74,185	7,169	67,016	27,015
2015	76,333	7,169	69,164	29,000
2020	76,333	7,169	69,164	29,000
2022	76,333	7,169	69,164	29,000
2025	76,333	7,169	69,164	29,000

C.4 Land-Use Based Population Projections

The City provided updated land-use information for the four service areas for two time periods: “developed” and “build-out.” For the purposes of this study, developed conditions were assumed to be representative of the conditions in 2003 across all service areas, while build-out conditions were projected to be reached by 2006 in the North Area and by 2009 in the South Area. 2006 was used as a build-out date for the North Area in an earlier report (City of Folsom, 2003), and the South Area is expected to reach build-out conditions in 2009 according to City staff (Payne, 2004).

The land-use data provided by the City included estimates for the number of multi-family and single-family housing units in each of the service areas. For projected build-out

conditions, there were also a limited number of acres for which no projected housing unit numbers have yet been compiled. For the land-use based population projections, these acres were converted to housing units using unit-per-acre data used by the City (3.3 single-family units per acre and 13.595 multi-family units per acre).

A summary of the land-use data provided directly by the City and that which was derived from the City data are included as **Table C.5**.

Table C.5: Summary of Land-Use Data (City of Folsom, 2004)				
Unit Type	FSA - West	FSA - East	American River Canyon	Ashland
Developed Conditions (2003)				
Single-Family Units	10,842	3,982	1,816	978
Multi-Family Units	2,802	600	128	1,281
Build-Out Conditions (2009)				
Single-Family Units	11,493	6,087	1,833	991
Multi-Family Units	3,827	1,085	128	1,281
Other Single-Family Acres	3	0	0	0
Other Multi-Family Acres	0	11	0	7
Derived Total Single-Family Units ²¹	11,503	6,087	1,833	991
Derived Total Multi-Family Units	3,827	1,236	128	1,378

With a total number of single- and multi-family housing units for each service area available for both the developed and build-out conditions, 2000 Census data were used to convert the housing units to population figures.

First, vacancy rates for each service area were derived using the data in **Tables C.2 and C.3**. While vacancy rates for all housing units in a service area were easily calculated (the ratio of vacant units to the sum of vacant and occupied units), it was also necessary to estimate a further breakdown of vacancy rates between single- and multi-family units. This was accomplished by assuming that the “for rent”, “for seasonal, recreational or occasional use,” and “for migrant workers” entries in **Table C.3** consisted of multi-family housing units, and the “for sale only” entries were single-family housing units.

²¹ The “derived total” value is obtained by adding the number of housing units included in the City data to the number of housing units derived by multiplying the acres of housing type by the City-provided number of units per acre.

The “remaining vacant” entries were split evenly between the single- and multi-family categories, with the results shown in **Table C.6**.

Table C.6	
Vacant Unit Estimate	
Service Area	Vacant Units
FSA – West	507
Single-family	179
Multi-family	328
FSA – East	126
Single-family	83
Multi-family	43
Ashland	69
Single-family	20
Multi-family	49
American River Canyon	68
Single-family	20
Multi-family	48

The numbers of vacant single- and multi-family units were then divided by the sum of the respective vacant unit numbers and the number of owner-occupied and renter-occupied units, respectively. This method assumes that rental units are multi-family units and owner-occupied units are single-family units, which indicates that the derived vacancy rates should only be considered as rough approximations. The resulting vacancy rate derivations are shown in **Table C.7**.

This table also shows estimates for the number of people residing in owner- or renter-occupied housing within each service area. These derivations were made using the data from **Table C.6**, dividing the populations within owner- and renter-occupied units by the associated number of owner- and renter-occupied housing units in each service area.

Table C.7:				
Vacancy Rate and People/Housing Unit Derivation				
	FSA - West	FSA - East	Amer R. Canyon	Ashland
Vacancy Rate (All Units)	4.04%	9.22%	3.51%	3.33%
Vacancy Rate (Single-Family)	1.92%	7.46%	1.37%	1.30%
Vacancy Rate (Multi-Family)	10.11%	17.06%	10.08%	9.19%
People/Owner-Occupied Unit	2.84	2.83	2.81	2.09
People/Renter-Occupied Unit	2.27	2.50	1.85	1.78

With the data from the 2000 Census, and the information derived using those data, the projected land use figures provided by the City were then used to estimate “developed” and “build-out” populations. First, the number of occupied single- and multi-family units for each time period was calculated by multiplying the total single- and multi-family housing unit numbers in **Table C.5** by the their respective occupancy rate (1 – vacancy rate) for each service area as shown in **Table C.6**.

Next, the number of housing units was multiplied by the people per occupied unit from Table 11 to obtain population estimates. This was done by again assuming that owner- and renter-occupied units roughly corresponded to single- and multi-family units. The resulting population estimates are shown in **Table C.8**.

Table C.8				
Land-Use Population Derivation				
	FSA - West	FSA - East	American River Canyon	Ashland
Land-use Derived Population at Developed Conditions (2003)				
Occupied Single-Family Units	10,634	3,921	1,791	965
Occupied Multi-Family Units	2,519	541	115	1,163
Single-Family Population	30,193	11,101	5,025	2,015
Multi-Family Population	5,721	1,352	213	2,072
Derived Total Population	35,915	12,453	5,238	4,086
Land-use Derived Population at Build-Out Conditions (2009)				
Occupied Single-Family Units ²²	11,282	5,994	1,808	978
Occupied Multi-Family Units	3,440	1,115	115	1,251
Single-Family Population	32,034	16,969	5,072	2,041
Multi-Family Population	7,814	2,784	213	2,228
Derived Total Population	39,848	19,753	5,285	4,269

One adjustment was necessary for the FSA – East area, due to the housing conditions present in 2000. As shown in **Table C.7**, vacancy rates for the service area are much higher than for other locations in the City. Out of the 126 vacant units estimated within the service area, 72 are within two Census blocks, as highlighted in **Figure C.3**. The Northern Census block is within a development known as The Parkway, where only 447 out of a planned 2,149 new homes (within the entire development, including outside of the Census block) had been built as of December 2001 (Sacramento Bee, 2001). Of the total 128 housing units in the Census block, 49 were vacant, and 35 of those vacant units were for sale as of the 2000 Census. These vacant units may have been recently built homes that were only just being listed for sale. Similarly, the Southern-more Census block of interest is within the Broadstone development, where as of December 2001, 2,150 out of a planned 2,800 homes were built (Sacramento Bee, 2001). For the 196 housing units in the census block, 23 were vacant, and 20 of the vacant units were for rent.

²² FSA – East occupied unit estimates used vacancy rates for single- and multi-family units that were equal to the average vacancy rates for the remaining three service areas.

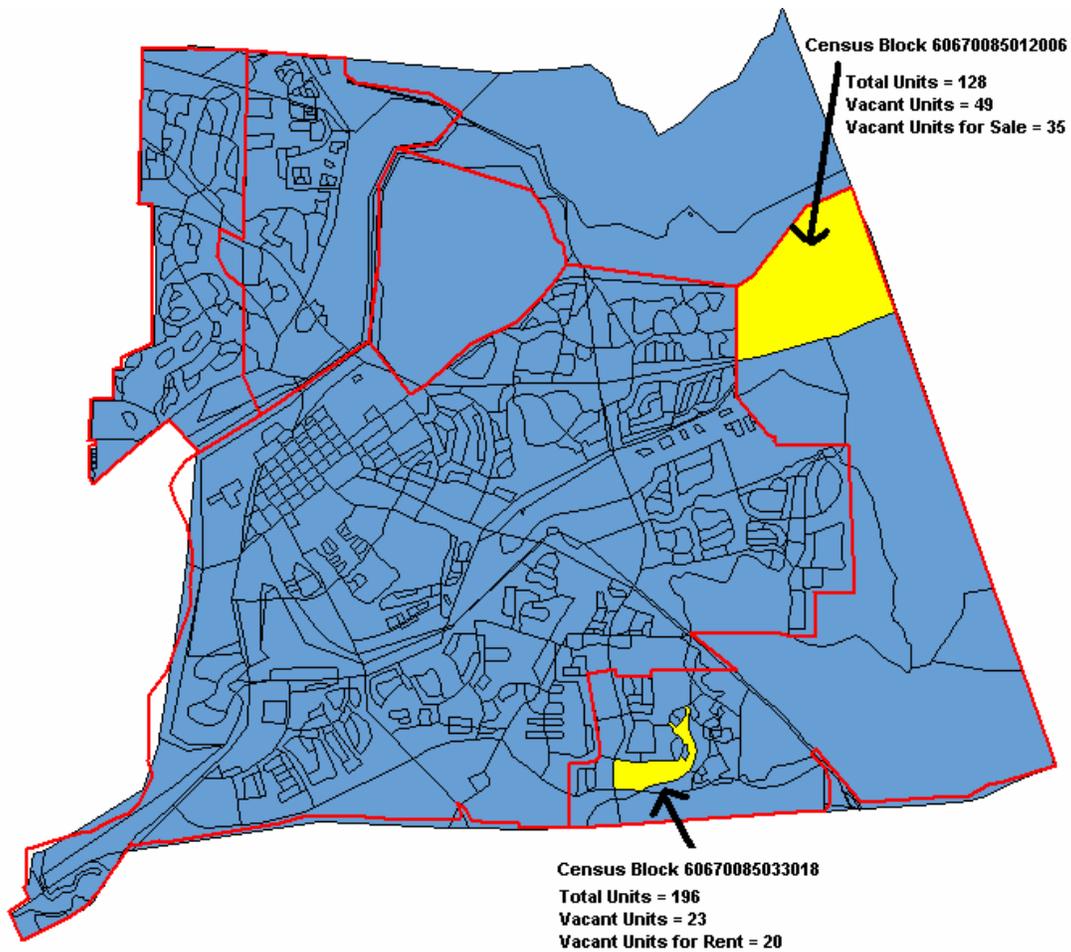


Figure C.3: Selected Census Blocks in FSA – East

For the purposes of the land-use based population exercise, the FSA-East service area vacancy rates for both single- and multi-family housing units were set equal to the average rates across the remaining three service areas. This was done to reflect the fact that a large amount of construction was underway in the FSA-East service area as of the 2000 Census, and many newly built units may have only just become available for sale or rent. The averaged vacancy rates, which were derived from values that were fairly consistent across the other areas, should more accurately represent vacancy rates for future conditions in the FSA-East region.

C.5 Choosing Population Sources for the City of Folsom Demand Study

Because per-capita water demand calculations are dependent on accurate population estimates, it is important to carefully construct the historic and projected population estimates for the four service areas. Multiple sources and techniques are available to complete these data sets, and this section describes which sets were chosen and why they were selected.

C.6 Choosing Historical Data

As discussed earlier, the U.S. Census data is widely used to establish historical population estimates. The level of detail acquired and the ability to geographically reference data to areas as small as Census blocks provides a powerful tool for population analysis. Census data was, as a result, chosen as the basis for historical population estimation in the City water demand studies.

Census data is, however, only acquired at ten-year intervals, whereas population – particularly in areas growing at rates as high as The City – can change considerably even over a single year. California Department of Finance estimates help resolve this issue by providing annual population figures for the entire City and for the individual group quarters facilities. Because the CDOF data is on a city-wide basis, however, this still left the problem of apportioning population across the four service areas.

Several steps were taken to address these limitations and establish a useful historical population data set for The City . First, historical population apportionment between the two South Area regions (FSA-West and FSA-East) was deferred, since treated water delivery data in the South Area is only available for the pressure zones that do not correspond to the FSA-West and FSA-East boundaries. As water production values are only available for the entire South Area, and since the per capita based water demands require both population and water demand/production quantities, population estimates for the entire South Area were used primarily, instead of using data from both component service areas.

Another simplification used to address data limitations was that population data focused on the time period from 1990 to present. U.S. Census Bureau and California Department of Finance data is available for the City several decades into the past, but annual population estimates for the City water demand studies primarily used data from 1990 on. This helped limit the amount of data analysis required to apportion population numbers across service areas using Census block data, which can be time-intensive.

Another technique that was used to fill in historical data gaps was the use of land-use based population estimates. The “developed” (2003) land use based populations for American River Canyon and Ashland shown in **Table C.8** were used to provide an estimate for the North Area population in that year. The South Area population for 2003 was then calculated as the difference between the total City population (without the Prison facilities) and the North Area population.

For the 1990 Census, population figures for larger Census tract areas were readily available, which allowed for easy calculation of North Area and South Area populations. However, Census block data – a subcomponent of census tracts – were not immediately available and would have required GIS analysis in order to estimate service area

populations. As a result, the 1990 Census population figure for the North Area was apportioned between American River Canyon and Ashland based on their respective percentages of the total North Area 2000 Census population.

With the 1990 and 2000 Census data and the land-use based 2003 population estimate, linear interpolation was then used to estimate populations for the North Area service areas between 1990 and 2000, and between 2000 and 2003. A January 1, 2004 estimate was obtained using linear interpolation between the 2003 and 2006 land-use based population estimates for the two North Area regions.

Finally, the South Area population was calculated for all historical years as the difference between the total City population (without the Prison facilities) and the total North Area population. The resulting data set is shown in **Table C.9**.

Date²³	Prison	South Area	American River Canyon	Ashland	All Folsom (without Prison)
1990	6,563	15,227	4,318	3,592	23,137
1991	7,254	17,842	4,369	3,635	25,846
1992	6,963	20,739	4,420	3,678	28,837
1993	7,293	21,865	4,472	3,720	30,057
1994	7,219	22,995	4,523	3,763	31,281
1995	6,828	23,592	4,574	3,806	31,972
1996	7,048	24,678	4,626	3,848	33,152
1997	6,967	26,265	4,677	3,891	34,833
1998	7,092	27,545	4,729	3,934	36,208
1999	6,976	30,717	4,780	3,977	39,474
2000	6,837	35,112	4,831	4,019	43,963
2001	6,918	40,692	4,952	4,045	49,689
2002	6,652	44,944	5,095	4,066	54,105
2003	6,499	48,049	5,238	4,086	57,373
2004	6,832	49,343	5,254	4,147	58,744

C.7 Choosing Population Projections

For projecting future populations for the City, three alternative sources were considered.

²³ All population estimates are for January 1 of the given year. Since U.S. Census data is obtained on April 1, the 1990 and 2000 populations listed in this table are slightly different than the Census data.

- ◆ The earlier planning reports prepared for the City (City of Folsom 1998, 2003) included population projections through build-out for both the North and South Areas.
- ◆ SACOG projections were also available, as mentioned earlier, but only provided City-wide estimates – not service areas estimates.
- ◆ Land-use based projections for build-out conditions also existed, as document previously using City-provided land-use data. This data was available for all four service areas, as shown in **Table C.8**.

Because of the large differences between U.S. Census data and the previous planning reports for the North Area (7,933 versus 4,709 in 1990, and 8,874 versus 11,000 in 2000, respectively), and since the SACOG projections were not on a service area level, the land-use based build-out projections, developed as part of this demand analysis, were used as the primary source for projecting the City ’s population in all four service areas.

To complete the dataset for the annual population projections, linear interpolation was used for the North Area between developed (2003) and build-out (2006) years. For the South Area, where build-out is anticipated in 2009, linear interpolation was used for the years between 2004 and 2009. The resulting projections are shown in **Table C.10**.

Date²⁴	Amer R. Canyon	Ashland	South Area	All Folsom (without Prison)
2005	5,269	4,208	51,398	60,876
2006	5,285	4,269	53,448	63,002
2007	5,285	4,269	55,497	65,051
2008	5,285	4,269	57,547	67,101
2009	5,285	4,269	59,602	69,156
All future populations through 2030 are assumed to remain at 2009 levels.				

A comparison of the different population projection sources is shown in **Figure C.4**, which represents total City populations without the Prison. As shown, both the SACOG and previous planning report population projections are lower than the land use based projections for time periods in the immediate future, but longer-term projections for all three sources predict a build-out population just under 70,000. Since the California Department of Finance’s City population estimate for 2004 was 58,744 without the Prison – a value which is higher than both the SACOG projection of 55,731 for 2005 and

²⁴ All population estimates are for January 1 of the given year.

the planning report (City of Folsom 2003) projection of 57,043 for 2007 – the land-use based estimates for the immediate future appear to be the most accurate projections available. This can partly be explained by the fact that the previous planning studies assumed build-out would occur in 2013 – four years later than current assumptions.

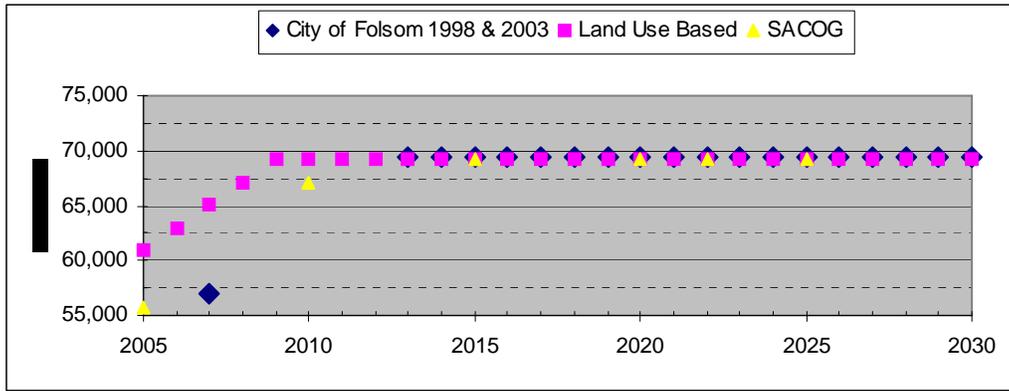


Figure C.4: Population Projections for City of Folsom (w/o Prison)

APPENDIX D – DEMAND MANAGEMENT MEASURE ANALYSIS AND DESCRIPTION

Water Code Section 10631 requires that an UWMP include a description of the urban water supplier's water demand management measures. Demand management is an integral part of the City of Folsom's long term water management strategy. Potential demand management programs are evaluated at the same level of detail as other supply options. In some instances, it may be more cost-effective to implement demand management programs than it would be to secure additional supplies and production/treatment facilities to meet existing and growing demands.

This appendix summarizes the City of Folsom's following demand management measures:

- ◆ DMM (a) - Water survey programs for single-family and multi-family residential customers
- ◆ DMM (b) - Residential plumbing retrofit
- ◆ DMM (c) - System water audits, leak detection and repair
- ◆ DMM (d) - Commodity rate metering for new connections and retrofit of existing connections
- ◆ DMM (e) - Large landscape conservation programs and incentives
- ◆ DMM (f) - High-efficiency washing machine rebate programs
- ◆ DMM (g) - Public information programs
- ◆ DMM (h) - School education programs
- ◆ DMM (i) - Conservation programs for commercial, industrial, and institutional accounts
- ◆ DMM (j) - Wholesale agency programs
- ◆ DMM (k) - Conservation pricing
- ◆ DMM (l) - Water conservation coordinator
- ◆ DMM (m) - Water waste prohibition
- ◆ DMM (n) - Residential ultra-low-flush toilet replacement

DMM A – Water survey programs for single-family residential and multi-family residential customers

The City of Folsom began implementing this program on August 1, 2000 and, because it is successful, anticipates continuing the program indefinitely. These programs generally involve sending a qualified water auditor to customer locations to audit water use, including a survey of both indoor and outdoor components. The indoor component checks for leaks in toilets, faucets, and meters, and checks showerhead, toilet, and aerator flow rates, offering replacements for high-flow devices. The outdoor survey includes checks of the irrigation system and control timers, and a review of, or development of, a customer's landscape irrigation schedule.

The City of Folsom's water survey program currently includes the following:

- Marketing of the program through:
 - City website
 - City newsletter
 - Contact at public events
 - Follow up from water waste complaints
 - Cold calls to resident managers (multifamily only)

- Survey details:
 - Discuss interior fixture conservation measures
 - Explain ULFT replacement and rebate program
 - Check irrigation timer
 - Run all zones of the sprinkler system
 - Note damage to the irrigation system and discuss necessary repairs
 - Note inefficient irrigation elements and discuss improvements
 - Review timer programming with homeowner/manager
 - Develop irrigation schedule
 - Deliver conservation packet

- Conservation packet includes:
 - Literature
 - “Sometimes less is more...water wisely!” (RWA)
 - “Water Management Program” (City of Folsom)
 - “ULFT rebate program” (RWA and SRCSD)
 - “There's a better way to water!” (City of Folsom)
 - “Smart Water and Energy Use in the West” (Sunset Magazine)
 - “How to Water Your Garden” (Sunset Magazine)
 - “Water Efficient Landscapes” (DWR, Office of Water Use Efficiency)
 - “Water Efficient Landscaping” (UC Extension, Master Gardeners)
 - “Landscape Design II” (Water Education Foundation)

- Devices
 - Toilet tank tummy.
 - Toilet tank leak dye
 - Low flow shower head
 - Low flow kitchen sink aerator
 - Low flow bathroom sink aerator
 - Garden hose nozzle

Table DMM A – 1 and **Table DMM A - 2** provide a record of recent program successes, as well as a projection of the City’s anticipated program goals.

Table DMM A - 1					
Actual					
	2001	2002	2003	2004	2005 (proj)
Single family surveys	114	48	145	171	188
Multi family surveys	0	0	0	1	3
Actual expenditures - \$*	\$3,357	\$1,428	\$4,270	\$5,065	\$5,536
Actual water savings-AF/Y* *	33.4	14.1	42.5	50.2	55.1

Table DMM A - 2					
Planned					
	2006	2007	2008	2009	2010
Single family surveys	207	228	251	276	304
Multi family surveys	5	6	7	8	9
Projected expenditures - \$*	\$6,243	\$6,891	\$7,598	\$8,363	\$9,217
Projected water savings-AF/Y**	60.7	66.9	73.6	81	89.2

*Cost for **one** residential survey includes one hour drive time and preparation:

Water Management Specialist	\$18.07
½ Ton Pickup	<u>\$11.38</u>
Hourly total	\$29.45 per hour

**Water savings estimates are based upon a limited sample of 4 homes. Average water savings is 262 gallons per day per residence after a survey.

DMM B – Residential Plumbing Retrofits

The City of Folsom began implementing this program on August 1, 2000, and because it is successful, anticipates continuing the program indefinitely. These programs generally involve sending a qualified water auditor to customer locations to audit water use, including a survey of both indoor and outdoor components. The indoor component checks for leaks in toilets, faucets, and meters and checks showerhead, toilet, and aerator flow rates and offering replacements of high-flow devices. A water conservation packet with retrofit devices is delivered to the customer at the time of the survey.

The City of Folsom’s residential plumbing retrofit program currently includes the following:

- Marketing of the program through:
 - City website
 - City newsletter
 - Contact at public events
 - Follow up from water waste complaints
 - Cold calls to resident managers (multifamily only)
 - Conservation packet includes:
 - Literature Cost for the literature packet \$10.00
 - “Sometimes less is more...water wisely!” (RWA)
 - “Water Management Program” (City of Folsom)
 - “ULFT rebate program” (RWA and SRCSD)
 - “There’s a better way to water!” (City of Folsom)
 - “Smart Water and Energy Use in the West” (Sunset Magazine)
 - “How to Water Your Garden” (Sunset Magazine)
 - “Water Efficient Landscapes” (DWR, Office of Water Use Efficiency)
 - “Water Efficient Landscaping” (UC Extension, Master Gardeners)
 - “Landscape Design II” (Water Education Foundation)
 - Water Wise Gardening Interactive CD 3.50
 - Devices
 - Toilet tank tummy. 1.75
 - Toilet tank leak dye 0.59
 - Low flow shower head 15.99
 - Low flow kitchen sink aerator 7.50
 - Low flow bathroom sink aerator 1.50
 - Garden hose nozzle 5.50
- Cost per packet \$46.33**

Table DMM B – 1 and **Table DMM B - 2** provide a record of plumbing retrofit activities, as well as a projection of anticipated retrofit activities.

Table DMM B - 1					
Historic Plumbing Retrofit Activities					
	1992-2001	2002	2003	2004	2005
Single family devices	0	30	50	171	188
Multi-family devices	0	0	0	1	3
Actual expenditures - \$	0	\$1,390	\$2,317	\$7,969	\$8,849
Table DMM B - 2					
Planned Plumbing Retrofit Activities					
	2006	2007	2008	2009	2010
Single family devices	207	228	251	276	304
Multi-family devices	5	6	7	8	9
Projected expenditures - \$	\$9,822	\$10,841	\$11,953	\$13,158	\$14,501

DMM C – System Water Audits, Leak Detection and Repair

The City plans to fully implement this DMM when meter coverage is sufficient to allow for meaningful results from meter data. As discussed in DMM D, full metering is likely to occur later than the planning horizon of this document.

The City is replacing mains and services for which their useful life has ended. The City is also working to detect leaks by isolating and analyzing older sections of its distribution system.

DMM D – Metering With Commodity Rates

The City of Folsom is in the process of converting from a partially to fully-metered system. The City of Folsom requires meters to be installed for all new connections, and bills on a volumetric basis for commercial, industrial, institutional, and multi-family customers. Volumetric billing is offered to all residential customers that want to convert from a flat rate charge. The City has started a meter retrofit program so that the City's remaining flat-rate residential customers are billed volumetrically by 2013.

The City has divided its geographic boundary into four distinct areas for purposes of water service. Each of these areas has a unique metering situation, based primarily upon the age of the development and the water service provider.

American River Canyon – As noted in Chapter 2 of the UWMP, customers in the American River Canyon area are served water by the San Juan Water District (SJWD). SJWD is responsible for metering and commodity pricing within this area of the City.

Ashland – The City of Folsom is the water retailer for accounts in the Ashland area, using water purchased and delivered by SJWD. Residential accounts will be metered by 2006 as required by Reclamation for use of SJWD water supplies. The City will evaluate metered use for one year, and then consider volumetric pricing for this service area beginning in 2007.

Folsom Service Area – West - This area is fully served by the City. Folsom Service Area – West contains the relatively oldest developments. In this area, the City's retrofitting program will focus on installation of meters where they don't exist and repair or upgrades of previously installed meters that have never been utilized for volumetric pricing.

Folsom Service Area – East – This area was constructed after 1992; therefore metering efforts will concentrate on retrofitting older meters, as needed.

As retrofitting progresses in these two areas, the City may consider volumetric pricing for the metered accounts some time after 2010 but before 2013. Once all accounts are metered, the City will consider conservation pricing.

Table DMM – D.1 provides an overview of scheduled metering implementation and associated costs/benefits for the Ashland service area

Table DMM D – 1					
Metering Implementation in the Ashland Service Area					
	2001	2002	2003	2004	2005
Total Accounts	1,599	1,599	1,599	1,599	1,599
Unmetered Accounts	994	994	994	994	994
Retrofit Meters Installed	<i>Information not available</i>				
Accounts without Commodity Rates	994	994	994	994	994
	2006	2007	2008	2009	2010
Total Accounts	1,599	1,599	1,599	1,599	1,599
Unmetered Accounts	0	0	0	0	0
Retrofit Meters Installed	0	0	0	0	0
Accounts without Commodity Rates	994	0	0	0	0

Table DMM D - 2 provides an overview of scheduled metering implementation and associated costs/benefits for the Folsom Service Area – West and East.

Table DMM D – 2					
Metering Implementation in the Folsom Service Area – West and East					
	2001	2002	2003	2004	2005
Total Accounts	19,753	19,753	19,753	19,753	19,753
Unmetered Accounts	17,946	17,946	17,946	17,946	17,946
Retrofit Meters Installed	<i>Information not available</i>				
Accounts without Commodity Rates	17,946	17,946	17,946	17,946	17,946
	2006	2007	2008	2009	2010
Total Accounts	19,753	19,753	19,753	19,753	19,753
Unmetered Accounts	17,946	17,946	17,946	17,946	17,946
Retrofit Meters Installed	3,500	3,500	3,500	3,500	3,500
Accounts without Commodity Rates	17,946	17,946	17,946	17,946	17,946

DMM E – Large landscape conservation programs and incentives

The City of Folsom began implementing this program in 1998 and because it is successful, anticipates continuing the program indefinitely. These programs generally involve sending a qualified water auditor to large landscape customer locations to audit water use and inspect irrigation components. Incentives are offered through a DWR Proposition 13 grant program administered by the Regional Water Authority (RWA)²⁵.

The City of Folsom's large landscape conservation program currently includes the following:

- Marketing of the program through:
 - City website
 - City newsletter
 - Contact at public events
 - Communication with other city departments responsible for large landscape sites; Parks and Recreation, Lighting and Landscape Districts, and Public Works
 - Communication with homeowner associations and property management companies
- Water audits include
 - Irrigation system inspection.
 - Can test to determine distribution uniformity.
 - Measure landscaped area
 - Establishing a water budget according to IA guidelines
 - Review or develop an irrigation schedule
 - Document damage and necessary repairs
 - Present upgrade opportunities for water efficiency
 - Determine eligibility for grants and incentives
- DWR Proposition 13 grant
 - \$5000 maximum per site
 - Covers equipment costs
 - Requires a water audit and budget
 - Available to public and private customers

²⁵ The Regional Water Authority (RWA) is a joint powers authority formed in 2001 to promote collaboration on water management and water supply reliability programs in the greater Sacramento, Placer, and El Dorado County region.

Table DMM E – 1 highlights the City’s dedicated landscape irrigation accounts, the dedicated irrigation meter accounts, and the dedicated accounts with water budgets.

Table DMM E – 1			
	2004	2005	2006
Dedicated Irrigation Meter Accounts	32	37	42
Accounts with Water Budgets	1	1	1

DMM F _ High-efficiency washing machine rebate programs

The City of Folsom will begin implementing this program in 2006, and, because of the success of other water districts and energy companies, anticipates continuing the program indefinitely. The City of Folsom is currently participating in a joint effort with the RWA, SMUD and PG&E to find the most efficient way to administrate the rebates on a regional level. The City is also monitoring local program administered by the El Dorado Irrigation District (EID) and San Juan Water District. The program is envisioned to be a cooperative effort between the membership of RWA and energy providers.

The City of Folsom's high-efficiency washing machine rebate programs will include the following:

- Marketing of the program through:
 - City website
 - City newsletter
 - Contact at public events
 - Follow up from water waste complaints
 - Cold calls to resident managers (multifamily only)
 - Cold calls to Laundromats.
 - Cold calls to hotel managers.

- Proposed rebate structure:
 - In accordance with the Consortium for Energy Efficiency tier rating
 - Tier 1 - \$75.00
 - Tier 2 - \$100.00
 - Tier 3 - \$125.00

DMM G _ Public Information Programs

The City of Folsom maintains an active public information campaign to promote and educate customers regarding water conservation and efficient irrigation, including:

- Provision of speakers to employee, community and media groups to promote conservation
- Paid Advertising
- Bill inserts/newsletters/brochures
- Highlighting water usage on water bills
- Coordination with other government agencies, industry groups, public interest groups, and media to promote conservation efforts



Between 1/1/05-9/21/05, the City of Folsom staff made eight presentations and manned informational booths at seventeen special events. **Table DMM G – 1** highlights specific 2005 outreach activities.

Table DMM G – 1

WATER MANAGEMENT PROGRAM PUBLIC OUTREACH ACTIVITIES 2005					YTD TOTAL = 3000	
DATE	EVENT	STAFF	TYPE	GROUP	SUBJECT	ATTENDANCE
1/12/2005	Landscape Expo	Don	Informational booth	CLCA	Water Conservation	350
2/5/2005	Ecolandscape Conference	Don,Tim	Informational booth	ELWG	Water Conservation	300
2/10/2005	Folsom Biz-Expo	Don,Tim	Informational booth	Folsom Chamber of Commerce	Water Conservation	275
3/30/2005	Folsom Citizens Academy	Don	Presentation	Folsom PD	Water Conservation	35
4/9/2005	FOHC Workshop	Don	Presentation	Sac. Master Gardeners	Efficient Irrigation	30
4/23/2005	Folsom Trails Day	Don	Informational booth	Folsom Parks and Rec.	Water Conservation	75
5/20/2005	Bike to work rally	Don	Informational booth	Folsom Parks and Rec.	Water Conservation	200
5/21/2005	FOHC Workshop	Don	Presentation	Sac. Master Gardeners	Efficient Irrigation	30
6/5/2005	Get W.E.T	Don	Informational booth	USBR ARWEC	Water Conservation	250
6/9/2005	Thursday Night Market	Don, Matt	Informational booth	City of Folsom	Water Conservation	100
6/16/2005	Thursday Night Market	Don, Matt	Informational booth	City of Folsom	Water Conservation	100
6/23/2005	Thursday Night Market	Don, Matt	Informational booth	City of Folsom	Water Conservation	100
6/30/2005	Thursday Night Market	Don, Matt	Informational booth	City of Folsom	Water Conservation	100
7/7/2005	Thursday Night Market	Don, Matt	Informational booth	City of Folsom	Water Conservation	100
7/14/2005	Thursday Night Market	Don, Matt	Informational booth	City of Folsom	Water Conservation	100
7/21/2005	Thursday Night Market	Matt	Informational booth	City of Folsom	Water Conservation	100
7/22/2005	Sac. Home Garden Show	Don	Presentation	RWA	Efficient Irrigation	30
7/28/2005	Thursday Night Market	Don	Informational booth	City of Folsom	Water Conservation	100
8/4/2005	Thursday Night Market	Don, Matt	Informational booth	City of Folsom	Water Conservation	100
8/6/2005	FOHC Harvest Days	Don, Matt	Informational booth	Sac. Master Gardeners	Water Conservation	250
8/6/2005	FOHC Harvest Days	Don	Presentation	Sac. Master Gardeners	Efficient Irrigation	70
8/11/2005	Thursday Night Market	Don	Informational booth	City of Folsom	Water Conservation	100
9/9/2005	Landscape class	Don	Presentation	San Juan Adult Ed.	Efficient Irrigation	30
9/13/2005	Master Gardener Meeting	Don	Presentation	Sac. Master Gardeners	Efficient Irrigation	50
9/21/2005	Folsom Citizens Academy	Don	Presentation	Folsom PD	Water Conservation	25

DMM H _ School Education Programs

Sacramento Water Works Association

The Sacramento Area Water Works Association (SAWWA) has a strong public information element with measures designed for school students. The City of Folsom provides extensive curriculum materials to its local schools to be incorporated into their classroom activities where appropriate. These materials include videos, workbooks and visual aids to supplement the Sacramento Water Works Association's school program.

In 2005, the City of Folsom facilitated development of water conservation videos for high-school students, adults and children respectively by holding a production contest. The videos were judged by a panel consisting of the Mayor, Utilities Director, Sacramento Bee, and the Sacramento River Watershed Program. The winning videos are used in the City's overall program.\

Time and equipment spent on this task was approximately \$10,000, including \$4,000 in equipment.

Regional Water Authority

The City of Folsom works in conjunction with the Regional Water Authority (RWA) to communicate with grammar and high school students throughout the greater Sacramento area regarding water conservation and efficiency management strategies.

The RWA Water Efficiency Program (WEP) provides products and services to water interests so that they may meet the implementation requirements of the Water Forum Agreement Best Management Practices for Urban Water Conservation.

The City of Folsom is a Category 1 WEP participant, which provides region-wide water efficiency activities such as school education, public outreach and other BMPs utilizing widespread marketing to the benefit of many water suppliers. Focused Category 1 services for 2004 included:

Newspapers in Education/Be Water Wise

Each year, the Regional Water Authority WEP collaborates with *The Sacramento Bee* to sponsor the Newspapers in Education "Be Water Wise" program. The program is designed to teach children about the importance of water efficiency and is targeted at K-8 classrooms throughout the Sacramento region. Educational materials include:

- ◆ Newspaper-style supplement called "Water" for every student
- ◆ "Be Water Wise" teacher's guide with a regional focus and lessons based on California state teaching standards

- ◆ Subscription to *The Bee*, including a class set of newspapers delivered to their classrooms on four consecutive Tuesdays beginning April 29
- ◆ California waterways map provided by the California Department of Water Resources
- ◆ Mr. Leaky water conservation booklet

“Be Water Wise” is promoted through joint outreach by *The Sacramento Bee* and the WEP. Outreach efforts include advertisements in *The Bee*, direct mail and special outreach by Water Efficiency Program member agencies.

Final enrollment for the **2004 “Be Water Wise”** program was 260 classrooms and approximately 6,500 students. This is an increase over last year of 43 classrooms and more than 1,000 students. The Sacramento Bee distributed 23,870 copies of the student supplement on April 26, 2004. Typically, this supplement is only delivered to those students participating in the “Be Water Wise” program. In 2004, *the Bee* delivered the supplement to every student participating in Newspapers in Education, so the conversation message was communicated to 17,370 more students than participated in the “Be Water Wise” program.

In 2002, 259 teachers and 6,700 students participated in the “Be Water Wise” program. Compared with 2001 figures, this is more than 100 additional classrooms. Teachers who participate in the program receive educational materials for their students, including:

Great Water Mystery

The Sacramento Stormwater Management Program (SSMP) and Regional Water Authority (RWA) hired the South Yuba River Citizens League (SYRCL) to provide the “Great Water Mystery” educational assembly for 15,000 third through sixth grade students in Sacramento and Placer Counties. The presentation is focused on water scarcity, conservation, and pollution. **Table DMM G – 1** describes the presentations made in the City of Folsom:

Table DMM G – 1			
“Great Water Mystery” Presentations			
Date	School	Grade	Students
9/27/04	Blanche Spretz Elem.	3-5	190
9/27/04	St. John’s Notre Dame	3-5	90
9/29/04	Empire Oaks Elem.	3	100
9/29/04	Oak Chan Elem.	3	100

DMM I – Conservation programs for commercial, industrial, and institutional accounts

The City of Folsom began implementing this program in 2005, and, because of the success of other water districts and energy companies, anticipates continuing the program indefinitely. The City of Folsom is performing water surveys through a cooperative program with the RWA and CUWCC. This program involves a site visit by a contractor who performs a water survey and replaces the pre-rinse hand valves in kitchen facilities with a low-flow model. The City is also coordinating with RWA to implement a rebate program for tank toilets, and is evaluating the opportunity to extend to flush valve systems.

The City of Folsom’s CII program includes the following:

- Marketing of the program through:
 - City website
 - City newsletter
 - Contact at public events
 - Follow up from water waste complaints
 - Cold calls by the contractor

- CII water surveys include:
 - Site visit by the contractor
 - Evaluation of water use
 - Recommendations to improve water efficiency
 - Explanation of rebate programs
 - Replace pre-rinse hand valve with a low flow model

Table DMM I – 1 provides a record of recent program successes, as well as a projection of the City anticipated program goals.

Table DMM I - 1 CII Conservation Program					
	2001	2002	2003	2004	2005
Surveys completed	n/a	n/a	n/a	n/a	47
Incentives provided?					Yes
Follow-up visits					0
Actual expenditures - \$					\$3,420
	2006	2007	2008	2009	2010
Surveys projected	36	40	44	48	53
Projected expenditures - \$	\$3,744	\$4,160	\$4,576	\$4,992	\$5,512

DMM J _ Wholesale Agency Programs

The City of Folsom is solely a retail water supplier, and therefore Demand Management Measure J does not apply.

DMM K _ Conservation Pricing

Water Rate Structure

The City of Folsom is planning to convert from a partially to fully-metered system.

All industrial and commercial connections are currently metered with water use charges following an inclining block rate.

Most residential connections are not currently metered. Once fully metered, the City will consider volumetric rates and conservation pricing. For further information regarding this planning process, please refer to Demand Management Measure D, “Metering with Commodity Rates.”

Sewer Rates Structure

The City of Folsom does not structure sewer rates to promote conservation.

DMM L – Water Conservation Coordinator

The City of Folsom created the Water Management Coordinator position in December of 2000 to oversee water conservation activities. The position is a permanent full time position. The coordinator is required to possess a Water Conservation Practitioner certification from the AWWA and be an Irrigation Association Certified Landscape Irrigation Auditor. The coordinator’s background includes experience in landscape, horticulture, irrigation, plumbing, public speaking, and administrative or business management.



- The City of Folsom’s Water Management Coordinator is Don Smith.
- Hired, Oct 2003 as a Water Management Specialist.
- Replaced Tim Crowley as Coordinator, Sep 2005
- Experience
 - Landscape contractor
 - Irrigation technician
 - Plumbing
 - Public speaking
 - Water Conservation Practitioner
 - Certified Landscape Irrigation Auditor
 - Owned and operated a landscape service

Tables DMM L – 1 provides history of the City’s staffing levels. **Table DMM L – 2** provides a projection of the City’s anticipated staffing levels.

Table DMM L – 1					
Water Conservation Staffing Level					
	2001	2002	2003	2004	2005
Full-time positions	2	2	2	2	2
Full/part-time staff	2	2	1	2	2
Table DMM L - 2					
Water Conservation Staffing Level					
	2006	2007	2008	2009	2010
Full-time positions	2	2	2	2	2
Full/part-time staff	2	2	2	2	2

DMM M – Water Waste Prohibition

The City has passed an ordinance stating that water will be used in a beneficial manner as shown in chapter 13.26 of its municipal code. Water use must be confined to a customer’s property with no run off allowed. The ordinance states that automatic shut-off devices on garden hoses shall be used and free flowing water from hoses or other watering devices is prohibited. Pools, spas, fountains, and ponds shall be leak-free and equipped with re-circulating pumps. The use of water to clean streets, parking lots, driveways, sidewalks, patios, tennis courts, or buildings is only allowed for health reasons.

The City employs seasonal staff to patrol the service area to assist in the enforcement of the water waste prohibition measures. **Tables DMM M – 1 and DMM M – 2** provide an estimate of past, current and future costs related to these activities.

The figures for 2001, 2002, and 2003 are estimates. The numbers for 2006 – 2010 are an average of 2004 and 2005 when the program had two full time staff members. The figures are based on ½ hour per call, \$18.07 for the water management specialist and \$11.38 for a ½ ton pick up. Total cost per call is \$14.73.

Table DMM M - 1					
Water Use Compliance Activities/Expenditures					
Actual	2001	2002	2003	2004	2005
Waste ordinance in effect	yes	yes	yes	yes	Yes
On-site visits	250	260	300	392	258
Water softener ordinance	no	no	no	no	No
Actual expenditures - \$	\$3,682	\$3,829	\$4,419	\$5,774	\$3,800
Table DMM M – 2					
Water Use Compliance Activities/Expenditures					
Planned	2006	2007	2008	2009	2010
Waste ordinance in effect	yes	yes	yes	yes	yes
On-site visits	325	325	325	325	325
Water softener ordinance	no	no	no	no	no
Projected expenditures - \$	\$4,787	\$4,787	\$4,787	\$4,787	\$4,787

DMM N – Residential Ultra-Low-Flush Toilet Replacement Programs

The City of Folsom began implementing this program in 2003 and, because it is successful, anticipates continuing the program indefinitely. This program generally involves sending a qualified water conservation staff person to customer locations to insure that the toilet being replaced is a pre-1994 high water use model. The customer is responsible to purchase and install their own toilets. After the toilet is installed the customer completes an application and sends it in with the original receipts or invoices for processing. The rebate amount is a maximum of \$125.00 per toilet. The program is a cooperative effort with the City of Folsom, the Sacramento Regional County Sanitation District (SRCSD), and the RWA. SRCSD contributes \$50.00 of the \$125.00 rebate per toilet. The City anticipates reaching a saturation rate at some point in the future, at which time it will be inefficient to continue the program.

The City of Folsom’s ULFT replacement program currently includes the following:

- Marketing of the program through:
 - City website
 - City newsletter
 - Contact at public events
 - Follow up from water waste complaints
 - Cold calls to resident managers (multifamily only)

Tables DMM N – 1 and DMM N – 2 provide a record of recent installations as well as a projection of anticipated installations, including associated expenditures.

Table DMM N – 1					
Historic and Planned Ultra Low Flush Toilet Replacements					
	Single-Family				
	2001	2002	2003	2004	2005
ULF rebates	0	0	1	110	212
Actual expenditures - \$			\$125.00	\$13674.51	\$26500
Actual water savings - AFY			0.03	3.4	6.36
Table N2	Single-Family				
	2006	2007	2008	2009	2010
ULF rebates	250	225	200	175	150
Projected expenditures - \$	\$31250	\$28125	\$25000	\$21875	\$18750
Projected water savings - AFY	7.5	6.8	6	5.3	4.5

APPENDIX E – CITY OF FOLSOM WATER SHORTAGE CONTINGENCY
PLAN

CITY OF FOLSOM

WATER SHORTAGE CONTINGENCY PLAN

MAY 26, 1992

TABLE OF CONTENTS

INTRODUCTION	2
Demographics	2
Objectives	3
Present Water Operations	3
Treatment Plant	3
Distribution System	4
WATER USE	5
Past	6
Current and Projected Use	6
Potential Supply Increases	6
COORDINATED PLANNING	7
Existing Coordination	7
Potential Coordination	8
WORST CASE SUPPLY	9
Existing Water Rights	9
STAGES OF ACTION	10
Stage 1. Normal Water Supply	10
Stage 2. Water Alert	11
Stage 3. Water Warning	11
Stage 4. Water Crisis	11
Stage 5. Water Emergency	12
Enforcement	12
Mandatory Prohibitions	12
Consumption Limits and Excessive Use Penalties	12
WATER USE MONITORING	13
Stage 1 Normal Supply Monitoring	13
Stage 2 and Stage 3 Water Crises Monitoring	13
Stage 4 Water Crisis Monitoring	13
Stage 5 Water Emergency Monitoring	14
FISCAL IMPACTS	15
PLAN IMPLEMENTATION	16
PLAN ADOPTION STANDARDS	17
APPENDICES	19

INTRODUCTION

This report presents the Water Shortage Contingency Plan required of all municipal water suppliers under state law AB 11X.

Prior existing state law requires every urban water supplier serving water directly to customers to prepare and adopt an urban water management plan. The City of Folsom prepared an extensive Urban Water Management Plan in 1990. The plan, complying with the requirements of the state Urban Water Management Planning Act, provides a detailed picture of the City's past, current and projected water situation and usage.

In 1991, amendments contained in AB 11 were made to the urban water management act. These amendments specified that the Urban Water Management Plan include an "urban water shortage contingency plan." In essence, the water shortage plan requires urban suppliers to develop contingency plans for shortages of up to 50 percent of current use.

The technical basis for the preparation of the water shortage contingency plan is contained in the City's Urban Water Management Plan and in other documents already compiled by the City, particularly the City's previous water conservation plan.

Demographics

The City of Folsom is primarily a residential community with a growing industrial component. The City adjoins the large Aerojet General Corporation and Folsom State Prison.

According to the state Department of Finance figures of May 1991, the City's population was 33,300. This figure includes approximately 7,000 prisoners at the state prison.

In August 1987, the City provided treated water to 5,176 connections, according to the City's Urban Water Management Plan. The largest user category was single-family residences with 4,691 unmetered flat-rate connections.

The remaining 485 metered connections include 175 multiple-family accounts (apartments and trailer parks), 250 commercial accounts, 22 industrial accounts, plus 38 public agency accounts. Residential water use represented 66 percent of the water produced; municipal and industrial users took up the remaining 34 percent, according to the Management Plan.

Water Shortage Contingency Plan

In 1989, the City's total use was 9,951 acre feet, according to City officials. In 1990, it was 12,597 acre feet. Further breakdown into user categories was not available. For the purposes of this Water Shortage Contingency Plan, such categories have been derived from factors contained in the Urban Water Management Plan.

Objectives

The City of Folsom, in this Water Shortage Contingency Plan seeks to meet the mandates of state law incorporated in AB 11 through the use, to the degree possible, of existing City policies and ordinances.

The Plan also seeks to meet water shortage contingencies while providing the highest level of information to the public regarding the stages of shortage and the contingencies to be implemented to meet the shortage stages.

Present Water Operations

The City of Folsom has been providing treated water to its residents since 1967, when it purchased the Southern California Water Company's Folsom operation. This water system treats and delivers U.S. Bureau of Reclamation (USBR) water taken from Folsom Dam. This USBR water is distributed to Folsom City residents east of the American River plus water customers within the Nimbus Assessment District.

The City's annual entitlement of Folsom Dam water equals 22,000 acre feet with a maximum diversion rate of 60 cubic feet per second or 38.8 million gallons per day (mgd).

In 1987, about 28 percent of USBR water entitlement was treated and distributed to City users. The City of Folsom also delivered untreated water via the Natomas Ditch and an open flume system to the Aerojet General Corporation and irrigation customers from the remaining available 72 percent.

The City also provides treated water to certain residents located to the west of the American River in the Ashland service area. This water is purchased at a wholesale rate from the San Juan Suburban Water District (SJSWD). The September 1983 contractual purchase price of \$64.37 per acre foot (\$0.20 per 1,000 gallons) includes all treatment and pumping distribution costs. The City is additionally responsible for maintenance of the Ashland pipe system.

Treatment Plant

The City's water treatment plant has a total rated capacity of 20 mgd determined by four, five-mgd filters. The plant capacity can be temporarily boosted to 30 mgd during short-term emergencies. Intake flows of untreated water into the plant can exceed outtake flows of treated water because of seven-million-gallons of raw-water storage located at the plant. The maximum recorded intake flow rate has been about 25 mgd.

Water Shortage Contingency Plan

Distribution System

Water from the City's treatment plant is delivered to all City water customers except those within the Ashland service area. The water distribution system is divided into three pressure zones. Zone One is a gravity system serving Old Town Folsom from downtown to the Aerojet facility. Zone Two provides waste to City Hall and the surrounding areas. Zone Three serves the areas around the water treatment plant.

Water in the distribution system is pumped from the seven million gallons of finished water storage capacity to five storage tanks. It then flows back by gravity. Zone Three's system includes a new pumping facility and one of the five storage tanks. This provides sufficient storage and pumping capability for meeting peak demand periods and fire supply.

The City has five reservoirs for the storage of treated water, supplied by two tanks with a total capacity of seven-million-gallons of finished water storage at the water treatment plant, serving all three pressure zones. Zone One is also served by the South and Nimbus reservoirs. Two reservoirs, Tower and East, provide water to Zone Two. Zone Three has one storage reservoir.

Water Shortage Contingency Plan

WATER USE

The citywide normalized water consumption patterns were analyzed from December 1986 through November 1987 in the City's 1990 Urban Water Management Plan. During the 12-month period of analysis, the City treated 4,799 acre feet of Folsom Dam water and purchased another 1,786 acre feet from the San Juan Suburban Water District (SJSWD).

This represented an annual consumption of 6,587 acre feet, a 10-percent increase over the 1986 calendar consumption total of 5,927 acre feet. Such increased water consumption was commensurate with the 8-percent population growth experienced within Folsom for those years.

The following chart represents the City's water use and water use patterns for the year studied in the City's 1990 Urban Water Management Plan.

MONTHLY CONSUMPTION BY USER (MILLION GALLONS)								
MONTH	SINGLE-FAMILY	MULTI-FAMILY	COM-MERCIAL	INDUS-TRIAL	PUBLIC/OTHER	TOTAL BILLED	UAW1	TOTAL
Dec. 1986	47.41	5.01	8.04	15.15	2.38	77.99	8.60	86.59
Jan. 1987	37.79	5.60	7.72	17.37	2.04	70.52	7.80	78.32
Feb.	33.28	4.53	7.36	13.98	2.02	61.17	6.80	67.97
Mar.	50.01	4.48	7.56	11.83	1.78	75.66	8.40	84.06
April	115.16	5.99	9.82	17.90	3.88	152.75	16.97	169.72
May	154.68	7.85	13.07	29.44	8.63	213.67	23.70	237.37
June	178.64	8.01	14.47	30.38	9.63	241.13	26.79	267.92
July	188.10	10.04	18.94	32.90	11.78	261.76	29.09	290.85
Aug.	195.30	8.91	14.03	34.78	13.51	266.53	29.60	296.13
Sept.	148.81	9.10	21.11	28.52	11.43	218.97	24.30	243.27
Oct.	133.60	6.56	18.49	26.28	6.99	191.92	21.30	213.22
Nov.	58.58	5.56	16.60	19.04	3.14	102.92	11.40	114.32
Average, mg	107	6	12	22	6	153	17	170
Aver., ac. ft.	328	19	36	66	19	468	52	520
Total, mg	1341	82	157	278	77	1935	215	2150
Total, ac. ft.	4115	250	482	851	237	5936	659	6595
Percent	62	4	7	13	4	90	10	100

Water Shortage Contingency Plan

Past

The above table shows the 1986 to 1987 monthly treated water consumption for different user types within the City. This table demonstrates a typical California water use pattern. Highest water consumption occurs in the summer due to landscape irrigation needs. Winter water consumption is the lowest of the year because exterior landscape irrigation needs are negligible.

The figures in the table are based upon necessary assumptions about residential population density, the number of multiple-family dwellings per metered connection and the percentage of unaccounted water use.

It was assumed that the single-family household size was three. Multiple family dwellings were assumed to have an average of two inhabitants each. Because the City's billing office had no record of the total number of multiple-family dwellings, it was assumed that an average of seven apartments or trailers shared one meter connection.

Current and Projected Use

Based upon the demographic breakdown assumed in the City's Urban Water Management Plan, projections of water use based on the City of Folsom's current and future populations can be made. The increased water consumption for nonresidential categories (commercial, industrial and public agency) is assumed to be proportional to residential population between 1987 and 2010, while unaccounted water use is assumed to remain at 10 percent of total production.

CURRENT AND PROJECTED ANNUAL CONSUMPTION BY USER (MILLION GALLONS)								
YEAR	SINGLE-FAMILY	MULTI-FAMILY	COM-MERCIAL	INDUS-TRIAL	PUBLIC/OTHER	TOTAL BILLED	UAW1	TOTAL
1987	1,341	82	157	278	77	1,935	215	2,150
1990	1,519	220	268	476	132	2,615	290	2,906
1995	2,205	319	390	691	191	3,736	422	4,218
2005	3,796	548	672	1,190	330	6,536	726	7,262
2010	4,237	617	756	1,339	371	7,356	817	8,174

Potential Supply Increases

The City has received a commitment of 7,000 acre feet per year in long term contracting with the U.S. Bureau of Reclamation. The process of environmental documentation necessary to enter into the contracts was begun in 1992 and water is expected to be available sometime in 1995.

COORDINATED PLANNING

Coordinated efforts to meet emergency water supply conditions in the City of Folsom are limited. Neighboring water suppliers and purveyors include the following:

- San Juan Suburban Water District, which provides service to 6,700 retail customers and wholesale operators to five purchasers, including the City of Folsom.
- The U.S. Bureau of Reclamation, which manages water wheeled through Folsom Dam.
- The Citrus Heights Irrigation District.
- The Orangevale Water Company.
- Fair Oaks Water District.
- The County of Sacramento Water Agency.
- The Placer County Water Agency.
- Northridge Water District.
- The City of Roseville.

Existing Coordination

The only existing coordination is the agreement between the City and San Juan Suburban Water District (SJSWD). The District provides treated water to certain residents located to the west of the American River in the Ashland service area.

The water to serve this area is purchased at a wholesale rate from the SJSWD. The September 1983 contractual purchase price of \$64.37 per acre foot includes all treatment and pumping distribution costs. The City is responsible for maintenance of the Ashland pipe system.

The entire annual needs of the Ashland service area, approximately 1,700 acre feet, are being met with SJSWD supply. However the minimum contractual guarantee is 700 acre feet per year. Currently there is a hookup under the American River bridge between the City and SJSWD

Water Shortage Contingency Plan

which would allow mutually exchanged supplies. In order for this option to be available, however, minor adjustments to the hookup will be required. For any long-term supply, greater improvements and pumping station control repairs may be necessary.

Potential Coordination

There are several areas of possible coordination in operation and supply available to the City. The City will begin to pursue or continue to pursue formalization of such coordination as a feature of this Water Shortage Contingency Plan. Options include:

- Negotiation with the Aerojet Corporation and other large contractual commitments for voluntary use cutbacks and emergency options on contracted supplies to these users in periods of water emergency, as defined in the stages of water shortage in this document.
- Hookup under the American River bridge with existing pipelines of the City and SJSWD. This would allow the two agencies to share supplies in either direction. Such an arrangement may be most important during periods of water shortage, particularly in the event that SJSWD is unable or unwilling to supply water above the 700 acre feet per year currently obligated under its agreement with the City.

WORST CASE SUPPLY

Existing Water Rights

The City of Folsom has water rights for 22,000 acre-feet per year (ac-ft/yr) from the U.S. Bureau of Reclamation Folsom Lake supplies. This "firm" supply was obtained with the City of Folsom's purchase of rights and operations from the Southern California Water Company in 1967.

A contract delineating ownership and responsibilities between USBR and the City of Folsom designates two points of diversion which the USBR owns and operates: one from Folsom Reservoir from which the City may divert up to 22,000 acre feet per year; the second on the Folsom South Canal which is limited to 10,000 acre feet per year at a rate up to 20 cubic feet per second.

In addition the San Juan Suburban Water District, under an agreement with the City, provides a minimum of 700 acre feet per year to lands within the City north of the American River.

The following table assumes a worst case scenario where USBR was unable to fulfill its contractual supply obligations due to water shortage. Supplies are assumed to be reduced according to the stages represented by 85 percent, 75 percent, 65 percent and 50 percent of contracted supply.

In addition it is assumed that San Juan Suburban Water District would be able to supply volumes commensurate with the reductions applied by the City, based upon the logic that because the District receives its supplies from the same source, similar reductions would be faced and passed on to the City.

WORST CASE SUPPLY PROJECTIONS (ACRE FEET)						
SOURCE	CONTRACTED	ACTUAL 1990	WORST 85%	WORST 75%	WORST 65%	WORST 50%
Folsom Dam USBR	22,000	11,000	18,700	16,500	14,300	11,000
SJSWD	700	1,700	1,445	1,275	1,105	850
TOTAL	22,700	12,700	20,145	17,775	15,405	11,850

STAGES OF ACTION

The City has adopted a water conservation ordinance which features mandatory participation in the event of prescribed stages of water shortage. The ordinance features five stages of action. The response to these stages will be triggered at prescribed levels. The stages will be monitored, reported and acted upon according to the plan set out in the "Monitoring" section which follows.

The following table summarizes the stages of action, description of the water supply condition, trigger levels and features of the corresponding responses. Following the table is a more detailed description of the stages of response, as contained in the City's existing ordinance.

DROUGHT CONTINGENCY STAGES OF ACTION			
STAGE OF ACTION	CONDITION	TRIGGER LEVEL	ACTION FEATURES
Stage 1	Normal water supply	100% supply	Wasteful features prohibited, no runoff.
Stage 2	Water alert	85% of supply	Exterior use limited to three days/wk.
Stage 3	Water warning	75% of supply	Exterior use limited to two day/wk.
Stage 4	Water crisis	65% of supply	Exterior use limited to one day/wk.
Stage 5	Water emergency	50% of supply	Exterior use prohibited.

Stage 1. Normal Water Supply

1. Water will be used for beneficial uses, all unnecessary and wasteful uses of water are prohibited.
2. Water shall be confined to the customer's property and shall not be allowed to run off to adjoining property or to the roadside ditch or gutter. Care shall be taken not to water past the point of saturation.
3. Prohibit free-flowing hoses for all uses including vehicle and equipment washing, ponds, evaporative coolers and livestock watering troughs. Attach automatic shut-off devices on any hose or filling apparatus in use.
4. Leaking customer pipes or faulty sprinklers shall be repaired within five days or less if warranted by the severity of the problem.

Water Shortage Contingency Plan

5. All pools, spas and ornamental fountains/ponds shall be equipped with a recirculating pump and shall be constructed to be leak-proof. Pool draining and refilling shall be allowed only for health, maintenance or structural considerations. Customer requests must be substantiated in writing by a pool consultant and approved by the City.

Stage 2. Water Alert

In addition to those actions required during Stage 1 normal water supply, the following mandatory steps are required:

1. Landscape and pasture irrigation shall be limited to a maximum of *three days per week* when necessary based on a schedule for odd and even addresses, with no irrigation permitted on Mondays.
2. Automatic sprinkler system timers shall be set to operate during off-peak hours between 10 p.m. and 10 a.m.
3. Prohibit washing of streets, parking lots, driveways, sidewalks or buildings except as necessary for health, sanitary or fire protection purposes.
4. Restaurants shall serve water only upon specific request.

Stage 3. Water Warning

The same voluntary and mandatory actions as Stage 2 are required, except that landscape and irrigation shall be limited to a maximum of *two days per week*, based upon an odd-even schedule with no irrigation permitted on Mondays, Thursdays and Fridays.

Stage 4. Water Crisis

The same voluntary and mandatory actions as Stage 3 are required, except that landscape and irrigation shall be limited to a maximum of *one day per week*, based upon an odd-even schedule with no irrigation permitted on Mondays, Tuesdays, Wednesdays, Thursdays and Fridays.

In addition:

1. No potable water from the City's system shall be used to fill or refill new swimming pools, artificial lakes, ponds or streams until the water crisis is declared over.
2. Water use for ornamental ponds and fountains is prohibited.
3. Washing of automobiles and equipment shall be done on the lawn or at a commercial establishment that uses recycled or reclaimed water.

Water Shortage Contingency Plan

Stage 5. Water Emergency

The same voluntary and mandatory actions as Stage 4 are required, except:

1. Landscape and pasture irrigation shall *not* be allowed.
2. Flushing of sewers or fire hydrants is prohibited except in case of any emergency and for essential operations.
3. Washing of automobiles and equipment shall be done at a commercial establishment that uses recycled or reclaimed water.
4. No potable water from the City's system shall be used for construction purposes such as dust control, compaction or trench jetting.

Enforcement

All employees designated by the City Manager have the duty and are authorized to enforce the provisions of the City's drought response ordinance. The ordinance applies to all customers receiving City water, whether inside or outside City limits.

No penalty is issued for the first violation; a personal notification is given. At the second violation and third violation a written notification is issued.

A fourth violation, in any six-month period, will result in the installation of a water meter to be provided and installed by the City. The meter will remain in place for 12 months and billed at the regular, established meter rate. In addition, the home owner shall pay a \$10 per month service charge as a share of the cost of installation.

Customers already on a water meter who receive a fourth violation in any six-month period shall pay a \$50 penalty for each month that the violation continues.

Mandatory Prohibitions

In addition to the mandatory provisions of the City's drought response ordinance, a "Temporary Water Service" ordinance requires a water use permit. This is for service provided on a temporary basis to activities such as new construction operations. The permit is issued for a limited period and the water use is charged on a City-provided meter. Wasteful use of the water by the permittee is prohibited, with violations subject to revocation of the permit.

Consumption Limits and Excessive Use Penalties

Because the City's consumers are charged a flat fee for water use, there are no consumption limits on water use. The City has no excessive use penalties.

WATER USE MONITORING

Monitoring procedures are established to account for the two key factors in a water shortage condition:

1. The level of water supply; and
2. The reduction achieved in the course of reduction contingency actions.

Monitoring of these conditions will largely be the responsibility of the City Public Works Director, working in coordination with the City Water Treatment Superintendent, the department Superintendent. After determining the stage of water shortage and triggering the stages of response, these officials will report the conditions to the City Manager, who will notify the public and authorize the necessary responses.

These monitoring actions will vary according to the stage of water supply in the following fashion:

Stage 1 Normal Supply Monitoring

In normal supply conditions, production figures are recorded daily. Totals are reported monthly to the Public Works Director.

Stage 2 and Stage 3 Water Crises Monitoring

During a Stage 2 or Stage 3 water shortage, weekly production figures are reported to the Public Works Director. The Director compares the weekly production to the target weekly production to verify that the reduction goal is being met. Production totals are reported to the City Manager. If reduction goals are not met, the Manager will notify effected departments, agencies and the public to implement corrective actions.

Stage 4 Water Crisis Monitoring

During a Stage 4 water crisis, daily production figures are reported to the Public Works Director. The Director compares the daily production to the estimated target daily production to verify that

Water Shortage Contingency Plan

the reduction goal is being met. Updates on production are reported to the City Manager daily until the crises abates.

Stage 5 Water Emergency Monitoring

During a Stage 5 water emergency, production figures will be reported to the Director hourly and to the City Manager daily (or more frequently, if necessary) until the emergency condition ends.

FISCAL IMPACTS

State regulations require that revenue impacts of projected water shortages and provisions in this plan to meet those shortages be addressed. Because the City of Folsom's water service is funded through a flat-rate charge to residential consumers, revenue impacts of decreasing supply and consumer use will be minimal.

However, water supplies purchased by the City from the San Juan Suburban Water District are obtained at a cost between \$65 and \$70 per acre foot. Thus a reduction in the use of water may have corresponding reductions in the expenditures by the City for this water supply. Also the City incurs unit expenses for water which it treats and supplies to customers. These costs are related to the cost of chemical to treat water and electrical power to pump the water to customers. If water supplies are restricted there will be corresponding reductions in these costs.

The relationship between revenues and expenditures are detailed in the table found in the appendix. That table includes projections of City water use, by user, for the projected years through 1994. Because the City's rates are flat, revenues grow with increased service accounts. Treatment costs (which do not include the fixed costs of operation, merely the unit cost differences in supply and treatment) also increase. This would always be the case when supplies of water exceed demand.

Only, however, if a Stage 5 water emergency of 50 percent reduction occurred would this not be the case: the City would find a shortfall in supply, particularly when use of water grows in the future. Ironically, the City would realize an even higher net revenue in such a case. Reduced unit costs of treating less water would mean savings, while rate revenues would continue. The table below illustrates how a Stage 5 shortage would impact revenues should it occur in 1994.

REVENUE AND EXPENDITURES IN SHORTAGE STAGES					
	STAGE 1 1990	STAGE 2 1991	STAGE 3 1992	STAGE 4 1993	STAGE 5 1994
Supply¹	100%	85%	75%	65%	50%
Revenues²	\$1,905,000	\$2,348,515	\$2,474,515	\$2,600,515	\$2,726,515
Costs³	\$264,017	\$356,476	\$377,476	\$398,476	\$313,066
Net	\$1,640,983	\$1,992,039	\$2,097,039	\$2,202,039	\$2,413,449

PLAN IMPLEMENTATION

Implementation of the City of Folsom Water Shortage Contingency Plan includes a public hearing process and adoption of the Plan by resolution of the City Council. The related water conservation ordinance necessary to implement the resolution is included in the appendix to this document. The complete implementation of the City's water shortage contingency plans are contained in the following actions which have already been passed or have been scheduled before the City Council. These include:

- City Water Conservation Ordinance, detailing the voluntary and mandatory actions required of consumers at the defined stages of water shortage.
- Temporary Water Use Permit Ordinance, required of all temporary users of water supply.
- The resolution approving the Water Shortage Contingency Plan.

The City's Water Conservation Ordinance will be the basis of the City's response measures to water shortage. The details of this ordinance are described in the section of this Plan on "Stages of Action."

No further action must be taken on the Conservation Ordinance; thorough public hearing of the measure preceded its adoption.

Further implementation of the plan will entail the beginning of the monitoring plan set forth in the section detailing such efforts. This will include reports to the Public Works Director according to the schedule set forth.

Other implementation steps which will be taken include pursuing of additional supplies which have been authorized by Congress and the initiation of possible coordinated planning with agencies and organizations cited in the section on coordinated planning. These steps will be pursued by the City Public Works Department.

PLAN ADOPTION STANDARDS

State regulations require that prior to the adoption of the City's Water Shortage Contingency Plan, a properly noticed public hearing shall be held. Prior to adoption and public hearing the plan must also be available for public inspection.

The City's public hearing will be held May 26, 1992 in City Council Chambers. Announcements of the meeting will be published in the Folsom Telegraph newspaper. Copies of the plan are available at City offices and at the City Library.

The City of Folsom prepared its plan with all the information necessary to meet the requirements of subdivision (e) of the California Water Code Section 10631. The final approved Plan will be filed with the state Department of Water Resources.

The 1992 Water Shortage Contingency Plan will be formally adopted on May 26, 1992. A copy of the resolution adopting the Plan is included in the appendices. The resolution empowers the City Manager to declare a water emergency and to implement the Plan.

Under the resolution, the City Manager is also authorized and required to present the Council with additional actions recommended in the event of a water shortage, including actions to assure an equitable distribution of water supplies available.

APPENDICES

**Revenues and Expenditures
At Stages of Water Shortage
City of Folsom**

(water figures in acre feet)

SUPPLIES	1989	1990	Stage 2	Stage 3	Stage 4	Stage 5
USBR Rights	22000	22000	18700	16500	14300	11000
SJSWD Rights	1700	1700	1445	1275	1105	850
TOTAL	23700	23700	20145	17775	15405	11850

USE	1989	1990	1991	1992	1993	1994
Res. Use (City)	5237	6946	7576	8206	8836	9466
Res. Use (SJSWD)	1629	1624	1624	1624	1624	1624
Enter. Use (1)	581	771	841	911	981	1051
City Treated (2)	5819	7718	8418	9118	9818	10518
Other Use (3)	2503	3255	3255	3255	3255	3255
TOTAL USE (4)	9951	12597	13297	13997	14697	15397
SURPLUS (5) (SHORTAGE)	13748	11102	6848	3778	708	(3547)

REVENUES	1989	1990	1991	1992	1993	1994
Res. Rev. (6)	\$1030050	\$1286415	\$1380030	\$1474530	\$1569030	\$1663530
Enter. Revenue	\$ 261855	\$ 346920	\$ 378810	\$ 410310	\$ 441810	\$ 473310
Other Rev. (7)	\$ 114695	\$ 271665	\$ 589675	\$ 589675	\$ 589675	\$ 589675
TOTAL REVENUE	\$1406600	\$1905000	\$2348515	\$2474515	\$2600515	\$2726515

COSTS	1989	1990	1991	1992	1993	1994
Treatment (8)	\$128382	\$159475	\$252540	\$273540	\$294540	\$315540
Chemical	\$ 26945	\$ 30214	\$ 50508	\$ 54708	\$ 58908	\$ 63108
Power	\$101437	\$129261	\$202032	\$218832	\$235632	\$252432
Supply (9)	\$104542	\$104542	\$103936	\$103936	\$103936	\$103936
Other Costs						
TOTAL COSTS	\$232924	\$264017	\$356476	\$377476	\$398476	\$419476

- (1) Includes commercial and multifamily accounts.
- (2) Includes only city residential and enterprise use.
- (3) Includes industrial and public users.
- (4) Projections are derived from Urban Water Management Plan.
- (5) Reduced supplies applied to projected years.
- (6) Based upon total accounts, including Ashland service area @ \$150/year.
- (7) Projections based on actual 1991 figure, which is assumed as those revenues remaining after the extracting of other revenues.
- (8) Treatment costs are applied only to treated water which is calculated only as "residential" and "enterprise" use. Projections of cost are based upon \$30 per acre foot treatment costs derived from the 1989 and 1990 costs per acre foot.
- (9) Supply costs include SJSWD supplies calculated at \$66.91/af for 1989 and 1990, and at the current charge of \$70.05 for projected years. SJSWD supplies are assumed to drop to the minimum contracted 700 af/yr during water shortages.

RESOLUTION NO. 3652

A RESOLUTION ADOPTING
WATER SHORTAGE CONTINGENCY PLAN

WHEREAS, the California Legislature enacted Assembly Bill 11X during the 1991 Extraordinary Session of the California Legislature (an act to amend California Water Code Sections 10620, 10621, 10631, 10652, and to add Section 10656 to the California Water Code, relating to water); and,

WHEREAS, AB11X mandates that every urban water supplier providing municipal water directly or indirectly to more than 3,000 customers, or supplying more than 3,000 acre-feet of water annually develop a Water Shortage Contingency Plan; and,

WHEREAS, the City of Folsom is an urban water supplier to more than 3,000 customers, and has, therefore, prepared and circulated for public review a Draft Water Shortage Contingency Plan, in compliance with the requirements of AB11X, and a properly noticed public hearing regarding said Draft Plan was held by the City Council;

NOW, THEREFORE, BE IT RESOLVED by the City Council of the City of Folsom as follows:

1. The Water Shortage Contingency Plan is hereby adopted and ordered filed with the City Clerk;
2. The City Manager is hereby authorized and directed to file this Plan with the California Department of Water Resources;
3. The City Manager is hereby authorized to declare a Water Shortage Emergency and implement this Water Shortage Contingency Plan;
4. The City Manager shall recommend to the City Council regarding additional procedures, rules and regulations to carry out effective and equitable allocation of water resources during a water shortage.

ORDINANCE NO. 722

AN ORDINANCE ADDING CHAPTER 13.26 TO THE FOLSOM
MUNICIPAL CODE TO ESTABLISH WATER CONSERVATION MEASURES
AND PENALTIES FOR VIOLATIONS
IN NORMAL RAIN YEARS AND DROUGHT YEARS

BE IT ORDAINED BY THE CITY COUNCIL OF THE CITY OF FOLSOM AS
FOLLOWS:

SECTION 1. The City Council of the City of Folsom has declared that water is a precious resource and conservation measures are needed for both normal rain fall and drought years.

SECTION 2. DEFINITIONS. For the purpose of the Ordinance, the following terms, phrases, words and their derivations shall have the meaning given herein. When not inconsistent with the context, words used in the present tense include the future, words in the plural number include the singular number, and words in the singular numbers include the plural number. The word "shall" is always mandatory and not merely directory.

- A. "CITY" is the City of Folsom
- B. "CUSTOMER" is any person using water supplied by the City of Folsom.
- C. "PERSON" is any person, firm, partnership, association, corporation, company or organization of any kind.
- D. "WATER" is water from the City of Folsom.

SECTION 3. APPLICATION. The provisions of this ordinance shall apply to all customers using water both in and the outside the City of Folsom, regardless of whether any customer using water shall have a contract for water service with the City of Folsom.

SECTION 4. MANDATORY REGULATIONS. This is a five stage conservation program.

STAGE 1 - NORMAL WATER SUPPLY

1. Water will be used for beneficial uses, all unnecessary and wasteful uses of water are prohibited.
2. Water shall be confined to the customer's property and shall not be allowed to run-off to adjoining property or to the roadside ditch or gutter. Care shall be taken not to water past the point of saturation.

PASSED AND ADOPTED this 26th day of May,
1992, by the following roll call vote:

AYES: Councilmember Rosaaen, Holderness, Kipp, Meyers,
Hannaford
NOES: Councilmember None
ABSENT: Councilmember None
ABSTAIN: Councilmember None

James "Bud" Hannaford
MAYOR

ATTEST:

Alicia Beedle
CITY CLERK

**CITY OF FOLSOM
CERTIFIED DOCUMENT**

**FOLSOM CITY CLERK
50 NATOMA STREET
FOLSOM, CA 95630**

The foregoing information is an official record of the Office of the City Clerk,
City of Folsom, County of Sacramento, State of California and is hereby cer-
tified to be true and correct.

Wendy Malhiot
WENDY MALHIOT, DEPUTY CITY CLERK

DATED: June 9, 1992

3. Prohibit free-flowing hoses for all uses including vehicle and equipment washing, ponds, evaporative coolers, and livestock watering troughs. Attach automatic shut-off devices on any hose or filling apparatus in use.

4. Leaking customer pipes or faulty sprinklers shall be repaired within five (5) days or less if warranted by the severity of the problem.

5. All pools, spas, and ornamental fountains/ponds shall be equipped with a recirculating pump and shall be constructed to be leak-proof. Pool draining and refilling shall be allowed only for health, maintenance, or structural considerations. Customer requests must be substantiated in writing by a pool consultant and approved by the City.

STAGE 2 - WATER ALERT

1. Water shall be used for beneficial uses, all unnecessary and wasteful uses of water are prohibited.

2. Water shall be confined to the customer's property and shall not be allowed to run-off to adjoining property or to the roadside ditch or gutter. Care shall be taken not to water past the point of saturation.

3. Prohibit free-flowing hoses for all uses including vehicle and equipment washing, ponds, evaporative coolers, and livestock watering troughs. Attach automatic shut-off devices on any hose or filling apparatus in use.

4. Leaking customer pipes or faulty sprinklers shall be repaired within five (5) days or less if warranted by the severity of the problem.

5. All pools, spas, and ornamental fountains/ponds shall be equipped with a recirculating pump and shall be constructed to be leak-proof. Pool draining and refilling shall be allowed only for health, maintenance, or structural considerations. Customer requests must be substantiated in writing by a pool consultant and approved by the City.

6. Landscape and pasture irrigation shall be limited to a maximum of THREE (3) DAYS PER WEEK when necessary based on the following ODD-EVEN schedule.

- Customers with street addresses that end with an ODD number may irrigate only on TUESDAYS, THURSDAYS, and SATURDAYS.
- Customers with street addresses that end with an EVEN number may irrigate only on WEDNESDAYS, FRIDAYS, AND SUNDAYS.
- NO irrigation is permitted on MONDAYS.

7. Automatic sprinkler system timers shall be set to operate during off-peak hours between 10:00 PM and 10:00 AM.

8. Prohibit washing of streets, parking lots, driveways, sidewalks, or buildings except as necessary for health, sanitary, or fire protection purposes.

9. Restaurants shall serve water only upon specific request.

10. Hand and manual watering follows the same ODD/EVEN day schedule and may be done anytime during the cool parts of the day.

11. Homes equipped with drip systems may water using that drip system every day as long as there is NO water run-off from the property.

12. Middle of the road landscapes (medians) are to be watered under the EVEN schedule. NO WATER SHALL OVER-SHOOT THE PLANTED AREAS OR RUN-OFF.

STATE 3 - WATER WARNING

1. Water shall be used for beneficial uses, all unnecessary and wasteful uses of water are prohibited.

2. Water shall be confined to the customer's property and shall not be allowed to run-off to adjoining property or to the roadside ditch or gutter. Care shall be taken not to water past the point of saturation.

3. Prohibit free-flowing hoses for all uses including vehicle and equipment washing, ponds, evaporative coolers, and livestock watering troughs. Attach automatic shut-off devices on any hose or filling apparatus in use.

4. Leaking customer pipes or faulty sprinklers shall be repaired within five (5) days or less if warranted by the severity of the problem.

5. All pools, spas, and ornamental fountains/ponds shall be equipped with a recirculating pump and shall be constructed to be leak-proof. Pool draining and refilling shall be allowed only for health, maintenance, or structural considerations. Customer requests must be substantiated in writing by a pool consultant and approved by the City.

6. Landscape and pasture irrigation shall be limited to a maximum of TWO DAYS PER WEEK when necessary based on the following ODD-EVEN schedule.

Customers with street addresses that end with an ODD number may irrigate only on TUESDAYS, and SATURDAYS.

Customers with street addressed that end with an EVEN number may irrigate only on WEDNESDAYS, and SUNDAYS.

NO irrigation is permitted on MONDAYS, THURSDAYS, and FRIDAYS.

7. Automatic sprinkler system timers shall be set to operate during off-peak hours between 10:00 PM and 10:00 AM.
8. Prohibit washing of streets, parking lots, driveways, sidewalks, or buildings except as necessary for health, sanitary, or fire protection purposes.
9. Restaurants shall serve water only upon specific request.
10. Hand and manual watering follows the same ODD/EVEN day schedule and may be done anytime during the cool parts of the day.
11. Homes equipped with drip systems may water using that drip system every day as long as there is NO water run-off from the property.
12. Middle of the road landscapes (medians) are to be watered under the EVEN schedule. NO WATER SHALL OVER-SHOOT THE PLANTED AREAS OR RUN-OFF.

STAGE 4- WATER CRISIS

1. Water shall be used for beneficial uses, all unnecessary and wasteful uses of water are prohibited.
2. Water shall be confined to the customer's property and shall not be allowed to run-off to adjoining property or to the roadside ditch or gutter. Care shall be taken not to water past the point of saturation.
3. Prohibit free-flowing hoses for all uses including vehicle and equipment washing, ponds, evaporative coolers, and livestock watering troughs. Attach automatic shut-off devices on any hose or filling apparatus in use.
4. Leaking customer pipes or faulty sprinklers shall be repaired within five (5) days or less if warranted by the severity of the problem.
5. All pools, spas, and ornamental fountains/ponds shall be equipped with a recirculating pump and shall be constructed to be leak-proof. Pool draining and refilling shall be allowed only for

health, maintenance, or structural considerations. Customer requests must be substantiated in writing by a pool consultant and approved by the City.

6. Landscape and pasture irrigation shall be limited to a maximum of ONE DAY PER WEEK when necessary based on the following ODD-EVEN schedule.

Customers with street addresses that end with an ODD number may irrigate only on SATURDAYS.

Customers with street addressed that end with an EVEN number may irrigate only on SUNDAYS.

NO irrigation is permitted on MONDAYS, TUESDAYS, WEDNESDAYS, THURSDAYS, and FRIDAYS.

7. Automatic sprinkler system timers shall be set to operate during off-peak hours between 10:00 PM and 10:00 AM.

8. Prohibit washing of streets, parking lots, driveways, sidewalks, or buildings except as necessary for health, sanitary, or fire protection purposes.

9. Restaurants shall serve water only upon specific request.

10. No water from the City's system shall be used to fill or refill new swimming pools, artificial lakes, ponds, or streams until the WATER CRISIS has been declared over.

11. Prohibit water use for ornamental ponds and fountains.

12. Washing of automobiles or equipment shall be done on the lawn or at a commercial establishment that uses recycled or reclaimed water.

13. No water from the City's system shall be used for construction purposes such as dust control, compaction, or trench jetting.

14. Hand and manual watering follows the same ODD/EVEN day schedule and may be done anytime during the cool parts of the day.

15. Homes equipped with drip systems may water using that drip system every day as long as there is NO water run-off from the property.

16. Middle of the road landscapes (medians) are to be watered under the EVEN schedule. NO WATER SHALL OVER-SHOOT THE PLANTED AREAS OR RUN-OFF.

STAGE 5 - WATER EMERGENCY

1. Water shall be used for beneficial uses, all unnecessary and wasteful uses of water are prohibited.
2. Water shall be confined to the customer's property and shall not be allowed to run-off to adjoining property or to the roadside ditch or gutter. Care shall be taken not to water past the point of saturation.
3. Prohibit free-flowing hoses for all uses including vehicle and equipment washing, ponds, evaporative coolers, and livestock watering troughs. Attach automatic shut-off devices on any hose or filling apparatus in use.
4. Leaking customer pipes or faulty sprinklers shall be repaired within five (5) days or less if warranted by the severity of the problem.
5. All pools, spas, and ornamental fountains/ponds shall be equipped with a recirculating pump and shall be constructed to be leak-proof. Pool draining and refilling shall be allowed only for health, maintenance, or structural considerations. Customer requests must be substantiated in writing by a pool consultant and approved by the City.
6. Landscape and pasture irrigation shall NOT BE ALLOWED.
7. Flushing of sewers or fire hydrants is prohibited except in case of a emergency and for essential operations.
8. Prohibit washing of streets, parking lots, driveways, sidewalks, or buildings except as necessary for health, sanitary, or fire protection purposes.
9. Restaurants shall serve water only upon specific request.
10. No water from the City's system shall be used to fill or refill new swimming pools, artificial lakes, ponds, or streams until the WATER CRISIS has been declared over.
11. Prohibit water use for ornamental ponds and fountains.
12. Washing of automobiles or equipment shall be done at a commercial establishment that uses recycled or reclaimed water.
13. No water from the City's system shall be used for construction purposes such as dust control, compaction, or trench jetting.

SECTION 5. STAGE OF CONSERVATION. Whenever the City Manager or his designee determines that the water available to the City is insufficient to meet the City's supply or distribution system is

unable to meet all the water demands of it's customers in the immediate future, the City Manager or his designee will select the necessary stage of conservation.

The City Manager shall use every available means to inform customers that such order is in effect.

SECTION 6. PENALTIES. Except as otherwise provided herein, violations of any provision of this ordinance shall be as follows:

<u>Violation</u>	<u>Penalty</u>
First	Personal notification
Second	Written notification
Third	Written notification
Fourth	Mandatory water meter

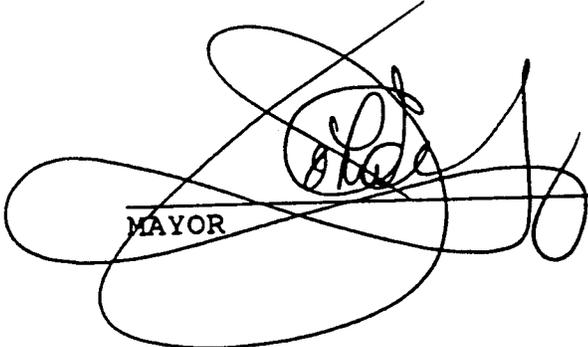
A fourth violation, in any six month period, will result in the installation of a water meter to be provided and installed by the City. The meter will remain in place for 12 months and billed at the regular, established meter rate. In addition, the home owner shall pay a \$10.00 per month service charge as a share of cost of installation.

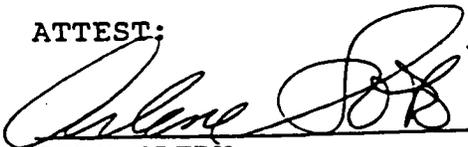
Customers already on a water meter who receive a fourth violation in any six month period shall pay a \$50.00 penalty for each month that the violation continues.

SECTION 7. ENFORCEMENT. All employees designated by the City Manager have the duty and are authorized to enforce the provisions of this ordinance.

PASSED AND ADOPTED this 14th day of May, 1991, by the following roll call vote:

- AYES: Councilmember Hannaford, Holderness, Myers, Gautschi, Kipp
- NOES: Councilmember None
- ABSENT: Councilmember None
- ABSTAIN: Councilmember None


MAYOR

ATTEST:

CITY CLERK