City of Roseville
2010 Urban Water Management Plan

August 2011

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SECTION 1
Plan Preparation

This Urban Water Management Plan (Plan) addresses the City of Roseville (City). The Plan is required by the Urban Water Management Planning Act (Act) (California Water Code Division 6, Part 2.6, Sections 10610 through 10657). This chapter provides an overview of the Plan, public participation, and agency coordination.

1.1. Urban Water Management Planning Act

One of the purposes of this Plan is to ensure the efficient use of available water supplies, as required by the Act. The Act became part of the California Water Code with the passage of Assembly Bill 797 during the 1983–1984 regular session of the California legislature. Subsequently, assembly bills between 1990 and 2009 amended the Act. Most recently the Act was amended in 2009 by SBx7-7 that requires a 20% reduction in statewide water usage.

The Act requires every urban water supplier providing water for municipal purposes to more than 3,000 customers or supplying more than 3,000 acre-feet of water annually to adopt and submit an urban water management plan every five years to the California Department of Water Resources (DWR). According to DWR, the Act states that these urban water suppliers should make every effort to assure the appropriate level of reliability in its water service sufficient to meet the needs of its various categories of customers during normal, dry, and multiple dry years. The Act describes the contents of the Plan as well as how urban water suppliers should adopt and implement the Plan. It is the intention of the Legislature, in enacting this part, to permit levels of water management planning commensurate with the numbers of customers served and the volume of water supplied.

The Plan describes the availability of water and discusses water use, reclamation, and water conservation activities. The Plan concludes that the water supplies available to the City's customers are adequate over the next 25-year planning period.

1.2. Coordination

This section of the Plan describes the coordination efforts that have taken place during Plan

development and approval.

1.2.1 Public Participation

The Act requires the encouragement of public participation and a public hearing as part of the Urban Water Management Plan approval process. As required by the Act, prior to adopting this Plan, the City made the Plan available for public inspection and held a public hearing. This hearing provided an opportunity for City's customers and all residents and employees in the service area to learn about the water supply situation and the plans for providing a reliable, safe, high-quality water supply for the future. The hearing was an opportunity for people to ask questions regarding the current situation and the viability of future plans.

A Notice of Public Hearing was published twice in the Press Tribune and copies of the draft Plan were made available for public inspection at the Environmental Utilities Department and at local public libraries. A copy of the published Notice of Public Hearing is included in Appendix A. The Plan was presented to the Roseville Public Utilities commission on May 24, 2011 with a recommendation provided to Roseville City Council. The Plan was adopted by the City Council on August 17, 2011. The Plan is available for public review at the City's Corporation Yard located at 2005 Hilltop Circle, Roseville, California, 95747.

1.2.2 Agency Coordination

The Act requires the City to coordinate the preparation of its plan with other appropriate agencies in the area, including other water suppliers that share a common source, water management agencies, and relevant public agencies including Cities and Counties, to the extent practicable. The City coordinated the preparation of its plan with Placer County, Placer County Water Agency, San Juan Water District, and Citrus Heights Water District, as well as its own planning and wastewater departments. A copy of this plan was provided to the DWR, Placer County, and Placer County Water Agency. Table 1-1 provides a summary of the plan coordination with the appropriate agencies.

Table 1.1 Coordination with appropriate agencies							
Coordinating Agencies[1,2]	**Participated in developing the plan**	**Commented on the draft**	**Attended public meetings**	**Was contacted for assistance**	**Was sent a copy of the draft plan**	**Was sent a notice of intention to adopt**	**Not involved / No information**
Placer County Water Agency					X	X	
San Juan Water District						X	
Citrus Heights Water District						X	
Placer County					X	X	
City of Roseville	X		X			X	
General public							
Other							

1.2.3 Notification Requirement

The Act requires the City to notify any city or county within which the City provides water. Notification must occur at least 60 days prior to the public hearing on the Plan. Pursuant to this requirement, the City is required to notify Placer County. Appendix C includes a copy of the notification sent to Placer County.

1.2.4 Plan Submittal and Availability

The Act requires the City to submit to the Department, the California State Library, and any city or county within which the City provides water supplies a copy of its plan no later than 30 days after adoption. The Plan will also be available at the City Clerks office at 311 Vernon Street and the City of Roseville Corporation Yard at 2005 Hilltop Circle.

1.3 Plan Implementation

The City plans to implement its Urban Water Management Plan through its ongoing water conservation programs, its ongoing planning work through its special planning areas and ongoing coordination with the United States Bureau of Reclamation on water supply planning issues.

SECTION 2
System Description

Section 2 describes the City's existing water system. It contains a description of the service area and its climate and population projections. This chapter also includes a brief description of the City's water supply facilities, including groundwater wells, surface water supply, treatment facilities, and the distribution system.

2.1. Service Area Physical Description

2.1.1 Description of Service Area

The City serves water to most of its residents. There are a few small areas that border with Placer County Water Agency, San Juan Water District, and Citrus Heights Water District that are served by each respective water agency. Roseville's city incorporated boundaries are set in the east area as it is adjacent to City of Rocklin and Granite Bay and in the south area by the Sacramento County line and the Dry Creek West Placer Community Plan Area. The north and west city boundaries are bordered by mostly undeveloped and unincorporated Placer county land that has the potential for future development. The City's service area and boundary are shown in Figure 2-1.

2.1.2 Climate

The service area experiences cool and humid winters and hot and dry summers. The City's weather is similar to the City of Sacramento which is in close proximity. Based on the historical data obtained from the Western Regional Climate Center, Sacramento's average monthly temperature ranges from 39 to 92 degrees Fahrenheit; but, the extreme low and high daily temperatures have been 17 and 114 degrees Fahrenheit, respectively. Data is shown in Table 2-1. The historical annual average precipitation is approximately 18 inches. The rainy season begins in November and ends in March. Average monthly precipitation during the winter months is about 2 to 3 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 results in high water demands during the summer.

Table 2.1 Climate Data					
Month	**Average precipitation (in.)**	**Average monthly ETo**	**Average temperature (°F)**	**Average Maximum temperature (°F)**	**Average Minimum temperature (°F)**
January	3.68	1.59	46.5	53.4	39.6
February	3.21	2.2	51.4	59.7	43.2
March	2.62	3.66	55.3	64.9	45.7
April	1.41	5.08	59.7	71.1	48.4
May	0.62	6.83	65.4	78.3	52.5
June	0.16	7.8	71.4	85.9	56.9
July	0.01	8.67	75.4	91.7	59.2
August	0.03	7.81	74.6	90.5	58.7
September	0.3	5.67	71.6	86.2	57
October	0.93	4.03	64.1	76.7	51.6
November	1.98	2.13	54.3	64.1	44.5
December	3.18	1.59	47	54	39.9
Annual	18.15	57.06	61.4	73	49.8

Above data obtained from the Western Region Climate Center, Sacramento 5 ESE (047633) Year 1877 to Year 2010. ETo was obtained from the CIMIS website: http://www.cimis.water.ca.gov/cimis/welcome.jsp. ETo averages were based on the Fair Oaks site.

2.2 Water Supply Facilities

This section provides a brief description of the City's existing water treatment and distribution facilities including raw water and potable water systems.

2.2.1 Potable Water Treatment

The City of Roseville operates a 100-million-gallon-per day (mgd) water treatment plant (WTP). The City's WTP is located on Barton Road in the Granite Bay community of Placer County. Raw (untreated) surface water from Folsom Lake is conveyed from the United States Bureau of Reclamation (USBR) facilities to the City's WTP. USBR raw water delivery facilities are described in the Water Distribution section below. Raw water treatment consists of these primary processes: flocculation/sedimentation, clarification, filtration and disinfection. Treated water is also fluoridated prior to distribution to City water customers.

2.2.2 Water Distribution

The City's water distribution system includes raw water facilities to deliver surface water supplies to the City's water treatment plant and the potable water facilities that deliver potable water to City water customers. In addition to the potable water system, the City also owns and operates wastewater treatment facilities which produce recycled water. This resource is delivered through a City owned and operated recycled water distribution system. These facilities are described in further detail in Section 4 of this Plan.

The raw water facilities consist of both infrastructure owned and operated by the USBR and infrastructure owned and operated by the City of Roseville. USBR facilities include an 84-inch intake pipeline and pumping plant. The pumping plant has sufficient capacity for SJWD, Roseville and portions of the City of Folsom. Roseville pumping capacity limits are 150 cubic feet per second (96.9 mgd). Once through the pumping station, water is conveyed through twin pipelines; 84-inch pipeline installed with original construction of Folsom facilities and a 72-inch pipeline constructed by Roseville and SJWD to provide required redundancy for facility maintenance. These common facilities convey raw water to the "Hinkel Y" where the flows to SJWD and Roseville are split. Raw water for Roseville then flows through parallel 60-inch and 48-inch raw water pipelines to the City's WTP. The raw water is then introduced at the influent portion of the Barton Road plant for treatment.

The City's potable water supply system is comprised of pipes, storage facilities, booster pumping stations, groundwater wells and pressure regulating stations. Distribution piping in the City ranges from as large as 66-inch diameter pipe to as small as 4-inch diameter pipe. The City designs its distribution system to meet various pressure and velocity criteria under average day, maximum day and peak hour delivery scenarios. In general, the City's system meets the maximum day demand criterion of 6 feet per second (fps) for transmission main velocity (i.e., the rate at which water flows through the pipelines) and the water pressure criterion of 50 pounds per square inch (psi). There are a few locations where these criteria are not met, but these discrepancies are minimal and do not adversely affect water service to customers.

The City has six storage tanks with a combined total storage capacity of 32 million gallons (mg) as identified in Table 2.2. Water storage is necessary in order to manage flow fluctuations on a daily basis, and to maintain sufficient storage to address emergency needs such as water main breaks and high water needs such as fire fighting activities.

Table 2.2 Roseville Storage Tank Summary

Facility	Pressure Zone Served	Capacity, MG	Type	Year Constructed
WTP 2 MG	1, 2, 4, 5	2	Steel	1971
WTP 4 MG	1, 2, 4, 5	4	Pre-stressed	1990
WTP 6 MG	1, 2, 4, 5	6	Pre-stressed	2004
Northeast 7.25 MG	1-5	7.25	Pre-stressed	2009
Northeast 10 MG	1-5	10	Pre-stressed	1998
Halverson 2.9 MG	2	2.9	Pre-stressed	2008

Note: MG = million gallons

The City currently has two pumping stations currently in the City, with plans for two more. The existing stations are the Dual Purpose Pump Stations (DPPS) and the Highland Reserve North Pump Station (HRNPS). As the name implies, the DPPS provides two distinct functions. The first is that it provides the ability to fill the City's North East Storage Reservoirs during off-peak demand periods and the second is that it boosts water pressures into higher elevation areas in and adjacent to the Stoneridge Specific Plan area of the City. This area is designated as Pressure Zone 2 which includes a 2.9 MG reservoir completed after submittal of the 2005 UWMP. The HRNPS allows the City to boost water pressures into higher elevation portions of the Highland Reserve North Specific Plan area, also designated as Pressure Zone 5. Existing pump stations are identified in Table 2.3. Future water storage tanks and pump station are planned for construction within the West Roseville Specific Plan and the Sierra Vista Specific Plan areas to service customers in the western portion of the City.

Table 2.3 Roseville Booster Pumping Station Summary

Facility	Service	Pump No.	Rated gpm, each	Constructed
Tank Fill (DPPS)	Fill 6 MG and 10 MG reservoirs	1-5	3,300	1998
Zone 2 (DPPS)	Boost pressure to Zone 2	1-5	2,015	1998
Highland Reserve North Pump Station	Boost pressure to Zone 5	1 - 2 (with 1 additional backup)	1,100	2007

Note: gpm = gallons per minute

2.2.3 Interties

Roseville maintains interties with surrounding jurisdictions for water sharing and transfer opportunities. Most times these are utilized for emergency transfers between agencies for a short duration but they can also be used for long term water sharing arrangements between agencies

for a variety of reasons. The current interties are listed in Table 2.4 with a description of the transfer intent following.

Table 2.4 Roseville Intertie Summary

Intertie Agency	Facility	Size, inches
Placer County Water Agency	Stoneridge	12
	5 Star	10
	Highland Park	12
	Pleasant Grove	12
	Industrial	16
	Bianchi Estates	12
San Juan Water District	WTP	12
	Eureka[1]	12
	Cavitt Stallman	12
Cal-Am	Crowder	12
	PFE	24
	Vernon Oaks[1]	12
Citrus Heights Water District	Orlando[1]	6
	Blossom Hill[1]	6
Sacramento Suburban Water District	PFE/North Antelope	24

Note: 1 Local zone feed only due to zone hydraulic grade line matching. Zone isolation required to move water between agencies.

Placer County Water Agency (PCWA) Intertie

Roseville maintains six interties with PCWA with a total capability of delivering 13 mgd. These facilities are designed to be used for wheeling water through the Roseville service area to PCWA customers and for short-term demand shortage assistance. This capability has been used during water transmission interruptions and for supplemental water to particular areas. In addition, an intertie facility has been designed and constructed that will increase reliability to PCWA customers residing within the City of Roseville. This facility, located at the Northeast tank site, allows PCWA to meet demands within their service area during peak times of the year.

San Juan Water District (SJWD) Intertie

Three interties exist between Roseville and SJWD. Two interties are capable of delivering a maximum of 2.5 mgd directly into Roseville's distribution system. The third intertie has the capability of up to 10 mgd and is located at the Roseville water treatment plant. These interties have been used during water plant interruptions and for localized water supply when required.

California American Water Company Intertie

Three interties exist between Roseville and California American Water Company. Due to low

operating pressures in the California American distribution system, one small intertie is only good for emergency zonal use within Roseville and cannot be relied upon as a continued source of water. The second intertie is used to service a development adjacent to Roseville and is capable of delivering up to 10 mgd. This intertie goes into a closed California American service area with no water source. This connection does not provide an opportunity for Roseville to receive water at this point.

Citrus Heights Water District Intertie

Two interties exist between Roseville and Citrus Heights Water District. Due to low operating pressures in adjoining agency's distribution systems these interties are only good for emergency zonal use within Roseville and can not be relied upon as a continued source of water.

Sacramento Suburban Water District Intertie

One intertie is being developed between Roseville and the Sacramento Suburban Water District (SSWD). As part of regional development of conjunctive use programs a 24-inch connection is being developed to connect Roseville and SSWD water service areas. At this time the actual operations or capacity has yet to be developed. It is planned, however, to be used to fully utilize Roseville water treatment and conveyance but will not result in any additional water supply as water contracts are currently sufficient for planned growth. This project would, however, increase reliability of water delivery capacity.

2.2.4 Groundwater Wells

The City currently operates five groundwater wells, and has plans to construct seven more. The existing wells are capable of delivering a total of approximately 12,000 AFY of water supply if run full-time, which is the equivalent of approximately 33 AF per day. With construction of the additional wells, the City's groundwater facilities would allow for delivery of up to 73 AF per day or 27,500 AFY if run on a continuous basis. The City's groundwater wells are currently maintained primarily for backup water supply and to improve water supply reliability during drought and emergency conditions. The City is in process of developing an Aquifer Storage and Recovery (ASR) program that would allow storage of surplus surface water in underground aquifers injected through these production wells. Of the five existing wells four have ASR injection capability and all future wells are planned to incorporate the same. Groundwater supplies are further discussed in Section 4.5.5.

There are five wells currently in place and operational. The existing operational well locations are summarized in Table 2.5.

Table 2.5 Roseville Well Facilities

Facility	Install/Rehab Date	Well Depth, feet	Rated Capacity, gpm	Service Zone
Darling Way (Well No. 4)	1958/1999	303	1,000	1
Oakmont (Well No. 5)	1978/1999	360	1,950	1
Diamond Creek	2002	323	2,700	4
Woodcreek North Well	2008	440	1,800	1
Atlantic Street	Pre 1958	330	800	1

Note: gpm = gallons per minute

2.3 Service Area Population

Projections for population, employment, and dwelling units within the City's water service area were completed for build out as part of the City's General Plan and are listed in Table 2.6. Baseline 2010 information is provided based on information from the Department of Finance for population and from information provided by the City's Planning Department for employment and the City's General Plan for dwelling unit count. Population, employment and dwelling units are projected through build out of the City's General Plan based on absorption information from various studies prepared as part of the City's standard development entitlement processes. Projections are only for the current City of Roseville Water Service Area boundary, including the newly annexed Sierra Vista and proposed Creekview Specific Plan areas. As identified in Figure 2.1, there are two areas that are within the incorporated City limits that are not with the Water Service Area boundary. These two areas are primarily residential units allowing an estimate of population served by others. Department of Finance and Roseville General Plan estimates for dwelling units were adjusted to account for areas within incorporated City but outside the City Water Service Area boundary.

Table 2.6 Population — current and projected							
	2010	**2015**	**2020**	**2025**	**2030**	**2035**	**Data source**
Service area population[1]	114,078	119,561	135,317	160,938	166,021	168,718	Department of Finance and projections developed by City of Roseville

[1] *Service area population is defined as the population served by the distribution system.*

2.4 Demographics affecting water supply

2.4.1 Employment, Land Use, and Population

The City completed a development study, 2025 Development Projections with Sierra Vista Specific Plan (2025 Development Plan) that analyzed current development trends and presented future employment, land use, and population projections. This section presents the findings from the study as they relate to the UWMP requirements. The complete study is included in Appendix D.

2.4.2 Employment Characteristics

The City continued to see increases in commercial and office employment over the last 10 years due to the expansion of the regional mall, additional local shopping centers, and many office parks. Prior to that, a large portion of the City's total employment had been industrial employment through the railroad yard and two large industries, Renasis (formerly NEC Technologies) and Hewlett-Packard. As Renasis and HP have moved portions of their manufacturing jobs out of Roseville, the industrial workforce demand has decreased some, but has been replaced by a higher demand for professional and retail jobs. City studies indicate the employment trend will continue to move from, industrial-based workforce centered around a few, large companies, to a more diverse light-industrial, professional and research and development based workforce. Health services have increased with major expansions to Kaiser and Sutter health facilities.

2.4.3. Land Use Characteristics

Land use characteristics have followed the employment characteristics for the City. Historically, there were a few industries with large land holdings for their manufacturing facilities and future expansions. As industrial jobs have relocated, the larger industrial tracts have and are being split and put back on the market with rezoning to allow development of residential and non-residential uses. New planning areas that are (or are planning to be) annexed into the City also have similar land use plans, with large portions of commercial and retail space to meet the projected demands. Roseville anticipates retention of an industrial sector demand but one that is much smaller and more specialized than past industrial employers. Roseville is therefore planning for smaller parcels of industrial land use located near existing industrial-zoned land.

With an increase in commercial and office related employment demands, Roseville is also planning for increased residential land use requirements. Due to high housing demands near

SECTION 3
System Demands

Water demand projections provide the basis for sizing and planning future water facilities. Water use and production records, combined with projections for urban development, provide the basis for estimating future water requirements. This chapter summarizes the water use and demand projections through the year 2035. This chapter also identifies the City's baseline and target requirements as part of the Water Conservation Bill of 2009.

3.1 Baselines and Targets

The Water Conservation Bill of 2009 (Sbx7-7) was enacted in November 2009. To increase water use efficiency, it requires that urban water suppliers reduce the statewide average per capita daily water consumption by 20 percent by December 31, 2020. The Bill requires urban water suppliers to establish their baseline daily per capita water use, an urban water use target and an interim urban water use target, and compliance daily per capita water use.

Table 3.1 includes the data required to calculate the City's base daily per capita water use. The table includes the start and end years for the selected range chosen to comply with Sbx7-7, for both the 10-year and 5-year average. Because the City's recycled water production is not greater than 10 percent of its total 2008 deliveries, the City is not able to use the 15 year base period.

Table 3.1
Base period ranges

Base	Parameter	Value	Units
10-year base period	2008 total water deliveries	34,052	*AF*
	2008 total volume of delivered recycled water	2,985	*AF*
	2008 recycled water as a percent of total deliveries	8.76	%
	Number of years in base period[1]	10	years
	Year beginning base period range	1994	
	Year ending base period range[2]	2004	
5-year base period	Number of years in base period	5	years
	Year beginning base period range	2003	
	Year ending base period range[3]	2007	

[1]If the 2008 recycled water percent is less than 10 percent, then the first base period is a continuous 10-year period. If the amount of recycled water delivered in 2008 is 10 percent or greater, the first base period is a continuous 10- to 15-year period.

Sbx7-7 requires agencies to calculate its base daily per capita water use in one of three ways. The first calculation requires an estimate of a water agencies average gross water use, reported in gallons per capita per day and calculated over a continuous 10-year period ending no earlier than December 31,2004 and no

later than December 31, 2010. The second calculation can be used by water agencies that meet at least 10 percent of its 2008 measured retail water demand through recycled water that is delivered within the service area of an urban retail water supplier or its urban wholesale water supplier. If the agency meets the 10 percent requirement, the agency may extend the base daily per capita water use calculation up to an additional 5-years to a maximum of a continuous 15-year period ending no earlier than December 31, 2004 and no later than December 31, 2010. The third calculation requires an urban retail water supplier to provide an estimate of its average gross water use, reported in gallons per capita per day and calculated over a continuous five-year period ending no earlier than December 31, 2007 and no later than December 31, 2010. As shown in Table 3.2, the City's 10-year average baseline calculation is 308.77. The law allows four compliance methods to satisfy the reduction requirements. The City chose method 1 which requires a reduction of water use of 20% from the 10-year average, requiring the City to reduce its water use to 247 GPCD by the year 2020. The City chose method 1 because it offered the City the most reasonable compliance reduction target.

The third calculation, as shown in Table 3.3, is used to meet the legislation's minimum water use reduction requirement per Section 10608.22. Because the City's 10-year average calculation meets the legislation's reduction requirement, the City does not need to further adjust its baseline calculation.

Table 3.2
Base daily per capita water use — 10- to 15-year range

Base period year		Distribution System Population	Daily system gross water use (mgd)	Annual daily per capita water use (gpcd)
Sequence Year	Calendar Year			
Year 1	1995	56,026	6,139,014,479	300.19
Year 2	1996	59,044	6,925,267,563	321.33
Year 3	1997	62,315	7,494,606,002	329.50
Year 4	1998	65,765	6,667,450,156	277.75
Year 5	1999	69,518	7,878,531,923	310.49
Year 6	2000	77,627	8,356,564,198	294.93
Year 7	2001	79,564	9,156,087,249	315.27
Year 8	2002	82,586	9,727,304,052	322.69
Year 9	2003	87,442	9,682,010,763	303.35
Year 10	2004	92,856	10,579,404,417	312.14
Average Base Daily Per Capita Water Use				308.77

Table 3.3 Base daily per capita water use — 5-year range				
Base period year		Distribution System Population	Daily system gross water use (mgd)	Annual daily per capita water use (gpcd)
Sequence Year	Calendar Year			
Year 1	2003	87,442	9,682,010,763	303.36
Year 2	2004	92,856	10,579,404,417	312.15
Year 3	2005	95,143	10,257,789,480	283.40
Year 4	2006	96,436	10,960,324,236	298.65
Year 5	2007	98,634	11,034,292,413	294.13
Base Average Daily Per Capita Water Use				298.34

3.2 Water Demands

3.2.1 Water Deliveries

This section provides historical and projected water demands. Demands are summarized by customer type and are presented in Tables 3.3 through 3.7. Historical water use is based upon system deliveries as recorded by the City of Roseville. The projected water demands are based on the City's unit water demand factors and applying them to land use designations in the City's General Plan. The summary tables for projected water demands also shows estimated population, and target future water demands based upon target per capita daily water use from implementation of water demand management measures as outlined in Section 6.

Table 3.4 Potable Water deliveries — actual, 2005					
	2005				
	Metered[1]		Not metered		Total
Water use sectors	# of accounts	Volume (AF)	# of accounts	Volume (AF)	Volume (AF)
Single family	22,138	11,782	11,309	7460	19,242
Multi-family	0	0	0	0	0
Commercial	1,734	4,611	326	797	5,408
Industrial	0	0	0	0	0
Institutional/governmental	0	0	0	0	0
Landscape (no recycled water)	1,124	6,425	0	0	6,425
Agriculture	0	0	0	0	0
System losses	0	0	0	0	0
Other	0	0	0	0	0
Total	0	0	0	0	31,075
Population 2005					95,143
Per Capita Water Use (gpdc)					291.6

[1]Multi-family, Industrial and Institutional water use included in the commercial sector.

Table 3.5 Potable water deliveries — actual, 2010					
	2010				
	Metered		Not metered		Total
Water use sectors	# of accounts	Volume (AF)	# of accounts	Volume (AF)	Volume (AF)
Single family	32,117	14,564	2,684	1,272	15,836
Multi-family	912	1,290	738	906	2,196
Commercial	1,345	2,011	45	31	2,042
Industrial	25	890	1	1	891
Institutional/governmental	232	656	16	11	667
Landscape (no recycled water)	1,218	5,534	0	0	5,534
Agriculture	0	0	0	0	0
System losses	0	0	0	1,195	1,195
Other	119	272	0	0	272
Total	35,968	25,217	3,484	3,416	28,633
Population 2010 (Dept of Finance)					114,078
Per Capita Water Use (gpcd)[1]					214.1

[1]Recycled water use not used to calculate GPCD calculation.

Table 3.6 Potable water deliveries — projected, 2015					
	2015				
	Metered		Not metered		Total
Water use sectors	# of accounts	Volume (AF)	# of accounts	Volume (AF)	Volume (AF)
Single family	36,461	25,345			25,345
Multi-family	1,859	3,210			3,210
Commercial	1,446	4,764			4,764
Industrial	27	2,435			2,435
Institutional/governmental	256	1,606			1,606
Landscape (no recycled water)	1,269	7,219			7,219
Agriculture	0	0			0
System losses	0	0	0	914	914
Other	119	267			267
Total	41,516	44,846	0	914	45,760
Population Projection – 2015					119,561
Target Per Capita Water Demand					278
Target 2015 Water Demand[1]					37,226

[1]Recycled water use not used to calculate GPCD calculation and has been deducted from target water demand.

Table 3.7 Potable water deliveries — projected, 2020					
	2020				
	Metered		Not metered		Total
Water use sectors	# of accounts	Volume (AF)	# of accounts	Volume	Volume (AF)
Single family	42,036	28,370			28,370
Multi-family	3,452	3,519			3,519
Commercial	1,523	4,787			4,787
Industrial	28	2,614			2,614
Institutional/governmental	270	1,710			1,710
Landscape (no recycled water)	1,336	7,237			7,237
Agriculture	0	0			0
System losses	0	0	0	990	990
Other	119	267			267
Total	48,765	48,504	0	990	49,494
Population Projection – 2020					135,317
Target Per Capita Water Demand					247
Target 2020 Water Demand[1]					37,441

[1]Recycled water use not used to calculate GPCD calculation and has been deducted from target water demand.

Table 3.8 Potable water deliveries — projected 2025, 2030, and 2035						
	2025		2030		2035 – optional	
	metered		metered		Metered	
Water use sectors	# of accounts	Volume (AF)	# of accounts	Volume (AF)	# of accounts	Volume (AF)
Single family	50,369	32,912	50,983	33,232	50,995	33,238
Multi-family	5,206	3,860	6,593	4,129	7,643	4,333
Commercial	1,614	4,944	1,722	5,107	1,851	5,512
Industrial	30	2,816	32	3,053	34	3,326
Institutional/governmental	288	1,827	305	1,967	326	2,126
Landscape (no recycled water)	1,415	7,346	1,514	7,622	1,624	7,897
Agriculture	0	0	0	0	0	0
System losses	0	1,101	0	1,130	0	1,157
Other	119	267	119	267	119	267
Total	59,039	55,071	61,268	56,507	62,592	57,855
Population Projection	160,938		166,021		168,718	
Target Per Capita Water Demand	247		247		247	
Target Water Demand[1]	44,530		45,937		46,683	

[1]Recycled water use not used to calculate GPCD calculation and has been deducted from target water demand.

3.2.2. Water Sold to Other Agencies

Roseville does not wholesale water to other agencies. Roseville does maintain 13 interties with neighboring water agencies to provide, or receive, water for emergencies or special operating conditions. Interties are described in Section 2. The objective is to match water taken with water delivered between the agencies which occur in most instances. There are, however, occasions due to system limitations that water supplied and water taken are not equal resulting in a water transfer between agencies. This volume of water is very small but is accounted for as delivered water as shown in Table 3.9.

Table 3.9 Sales to other water agencies (AFY)							
Water distributed	**2005**	**2010**	**2015**	**2020**	**2025**	**2030**	**2035 - opt**
PCWA Intertie Agreement	236	54	0	0	0	0	0
Total	236	54	0	0	0	0	0

3.2.3. Additional water uses and losses

This section describes additional water uses and losses. Additional water is the amount of City water demands that is met through the use of recycled water supplies. Losses include unaccounted-for water which includes un-metered water use; such as, fire protection and training, system and street flushing, sewer cleaning, construction, system leaks, and unauthorized connections. Unaccounted-for water can also result from meter inaccuracies. The City assumes two percent unaccounted-for water when preparing demand projections. The City recognizes that actual water losses are potentially greater then the 2 percent factor used. However, because the water demand projections are based upon conservative unit demand factors applied to land use entitlements, a relatively low water loss factor is used so as not to significantly overstate future projected water demands. The City intends to be fully metered by 2012, and will be able to better evaluate unaccounted-for water as more data is available for analysis. Table 3.10 below, summarizes additional water uses and estimated system losses.

Table 3.10
Additional water uses and losses (AFY)

Water use[1]	2005	2010	2015	2020	2025	2030	2035 - opt
Saline barriers	0	0	0	0	0	0	0
Groundwater recharge	0	0	0	0	0	0	0
Conjunctive use	0	0	0	0	0	0	0
Raw water	0	0	0	0	0	0	0
Recycled water	2,045	1,709	2,197	2,670	2,980	3,397	3,770
System losses	0[1]	1,195	914	990	1,101	1,130	1,157
Other (define)							
Total	2,045	2,904	3,111	3,660	4,081	4,527	4,927

[1] audit not performed in 2005. No water loss information available

3.2.4. Total water use

Table 3.11a and 3.11b summarizes total water use projected through 2035. Table 3.11a is based upon target water deliveries the City hopes to achieve through the implementation of water demand reduction measures to lower per capita water use as required by SBx 7-7 while Table 3.11b summarize estimated demands based on historical water demands. Because of the early stage at which the City finds itself with respect to understanding the success at which water reduction measures will reach targeted per capita water use, the City relies upon its water demand projections in Table 3.11b for the planning for future water supplies and infrastructure. This will be re-evaluated as additional water use data and efficiency measures are implemented as part of this plan.

Table 3.11a Total water use (AF) Assumes Reduced Per Capita Water Use is Achieved							
Water Use	**2005**	**2010**	**2015**	**2020**	**2025**	**2030**	**2035**
Total target water deliveries and losses (from Tables 3.4 to 3.8)	31,075	27,438	37,226	37,441	44,530	45,937	46,683
Sales to other water agencies (from Table 3.9)	236	54	0	0	0	0	0
Recycled water (from Table 3.10)	2,045	1,709	2,197	2,670	2,980	3,397	3,770
Total	33,356	29,201	39,423	40,111	47,510	49,334	50,453

Table 3.11b Total water use (AF) Assumes Historical Water Use							
Water Use	**2005**	**2010**	**2015**	**2020**	**2025**	**2030**	**2035**
Total water deliveries and losses (from Tables 3.4 to 3.8)	31,075	28,633	45,760	49,494	55,071	56,507	57,855
Sales to other water agencies (from Table 3.9)	236	54	0	0	0	0	0
Recycled water (from Table 3.10)	2,045	1,709	2,197	2,670	2,980	3,397	3,770
Total	33,356	30,396	47,957	52,164	58,051	59,904	61,625

3.2.5 Low-income projected water demands

Future housing needs were derived from projections provided by the Regional Housing Needs Allocation Plan (RHNAP), which was adopted by the Sacramento Area Council of Governments (SACOG) in 2008. The California Government Code requires cities to use the growth rate projections contained in the RHNAP. The City has established a 10% Affordable Housing Goal, which is less than the Regional Housing Needs Allocation (RHNA), based on existing and projected fiscal realities rather than a need which cannot be achieved. Water demands for low-income projects are included with the projected water demands as shown in Tables 11a and 11b above as the demand estimates are based upon existing and planned land use. The demand for low-income projects is difficult to estimate but based on water projections in Tables 3.5 to 3.8 and the application of the 10% low income the goal is described in Table 3.12.

Table 3.12 Low-income projected water demands (AF) Assumes Historical Water Use						
Low Income Use type	**2010**	**2015**	**2020**	**2025**	**2030**	**2035**
Single Family Residential	1,583	2,534	2,847	3,291	3,323	3,324
Multi-family Residential	219	321	352	386	413	433
Total	1,802	2,855	3,199	3,677	3,736	3,757

3.3 Water Demand Projections

As stated previously, Roseville treats and delivers surface water from Folsom reservoir as the primary supply of water. The water volumes are those that have either been paid for or have been scheduled for availability. The information in the requested Table 3.12 is consistent with the requested information in Section 4, Tables 4.1 and 4.2.

Table 3.13 Retail agency demand projections provided to wholesale suppliers							
Wholesaler	**Contracted Volume**	**2010**	**2015**	**2020**	**2025**	**2030**	**2035 - opt**
United States Bureau of Reclamation (Folsom Supply)	32,000 AF	32,000	32,000	32,000	32,000	32,000	32,000
Placer County Water Agency (Middle Fork Project water delivered through Folsom Reservoir)	30,000 AF	10,000	15,000	20,000	30,000	30,000	30,000
San Juan Water Agency (Middle Fork Project water delivered through Folsom Reservoir)	4,000 AF	0	4,000	4,000	4,000	4,000	4,000

3.4 Water Use Reduction Plan

Reduction in water demand across all customer sectors will be essential to achieving the conservation goals established by legislation and laid out in this plan. Demand Management Measures (DMM's) identified in Section 6 will be the focus of implementation measures to change customer behaviors with the overall objective of increasing water awareness. In addition to the listed DMM's additional activities will be required to achieve the water reductions necessary to meet the reduction goals. Measures that will be considered when developing budgets and project plans include:

- Water reduction strategies for new development:
    - Compliance with Water Efficient Landscape Requirements for all new and renovated landscapes as applied to existing development areas. New development areas are also required to reduce landscape area and calculated water demands as part of the process for land use approval. This has been a successful approach in recent land use negotiations.
    - Increased utilization of recycled water in new development areas. Roseville has typically required recycled water to be used in any land use development areas currently being planned. The level of use is consistent with semi-aggressive measures, utilizing recycled water for landscaping associated with commercial, industrial, multi-family, parks, and transportation corridors. Roseville has yet to implement recycled water in single family residential applications or for internal uses.
    - Implementation of low water use fixtures and other plumbing features as required by then current Building Code requirements. In some instances Roseville can incentivize/require conserving measures over that required by building code. (i.e. HET Toilet, re-circulating hot water systems)

- Water reduction strategies for existing development:
    - Landscape improvement programs
        - "Cash for Grass" to provide incentives for removal of turf in existing landscape areas and replace with low water use alternatives.
        - Landscape design assistance to provide homeowners with ideas and alternatives that will result in lower water use for same landscape areas under renovations or replacement.
    - Plumbing retrofit incentives as appropriate on existing residences and businesses
    - Conversions of landscape areas currently irrigated with potable water to recycled water as appropriate.
    - System rehabilitation and resulting reduction in water loss

- Customer behavior change:
    - Realize future generations will be more conservation minded and looking for ways to incorporate more water conserving measures in their homes and businesses. This will result in a gradually shift in water awareness and demand.
    - Water billing opportunities to communicate water use correlation to utility bill more clearly. Items to be considered are water budget billing and increased block water rates to incentivize water conservation.

Economic impacts of future reduction measures will be determined as individual programs are developed.

It is assumed that potential exists for impacts in the areas of:

- Increased cost of programs will result in high water bills required to pass costs on to consumers. This may result in the potential for reduced economic development.
- On the positive there may be opportunities for niche markets and services related water efficiency programs, equipment and services. As awareness in water efficiency increases along with water costs private offerings will develop to meet customer needs, creating opportunities for business growth in the area.

SECTION 4
SYSTEM SUPPLIES

The City of Roseville's water source has historically been from surface sources. American River water delivered through Folsom Lake has been the primary source since the Roseville water treatment plant came on-line in 1971. Through this intake Roseville receives water from the United States Bureau of Reclamation (USBR) as well as Placer County Water Agency (PCWA) raw water that is wheeled through USBR facilities. While surface water is the City's primary supply source, groundwater is occasionally used as a short term, back-up supply for drought and emergency conditions. The last instance of groundwater use to supplement water shortages as a result of drought conditions was in 1991. During a period from July 2007 through February 2008 wells were operated and delivered water to the distribution system as a part of the Aquifer Storage and Recovery project being developed by the City of Roseville. This was an effort to gain information on the distribution system performance and customer water quality issues resulting from service of aquifer stored water. Recycled water is also used within portions of the City to offset surface water supply needs. Recycled water is supplied from two regional wastewater treatment plants which are owned and operated by the City of Roseville.

In addition to the three water supply sources described above, intertie water from adjacent agencies is available. Intertie water, however, is typically used during treatment plant disruptions or distribution system projects that require supplemental water to the system on a short term basis. Several interties are used for wheeling of water by Roseville on behalf of PCWA to support water deliveries to portions of their service area. Due to specific system constraints there are also short term water sharing needs that are implemented between PCWA and the City. All these opportunities for water sharing are included in interagency agreements between the City and PCWA that define the conditions of any transfers.

4.1 Water Sources

Roseville currently has four sources of water that can be used to meet the system demands within the service area; surface water, groundwater, conserved water and recycled water. Descriptions of these water supply sources are included in the following sections.

4.1.1 Surface Water

The City's current annual surface water supply is for 66,000 acre-feet of American River water

diverted from Folsom Lake. The surface supply is summarized in Table 4.1. The City has access to this supply through contract entitlements with the USBR, PCWA and San Juan Water District (SJWD). The contract entitlement with the USBR is for 32,000 acre-feet for Central Valley Project (CVP) supplies. The City's contract entitlement with PCWA allows for 30,000 acre-feet with an anticipated take or pay schedule. The PCWA contract serves Middle Fork Project water through Folsom Lake. Lastly, the City has a current contract with SJWD for 4,000 acre-feet. The SJWD supply is served from part of SJWD's contract with PCWA for 25,000 acre-feet of Middle Fork Project water, also served through Folsom Lake. The SJWD supplies are only available during wet and normal years.

The City may also purchase Section 215 water from the USBR when available, but has not done so at this time. Section 215 water is water the Bureau releases from Folsom Lake that is in excess of the entitlements and rights of downstream users, and is usually only available during winter months.

Table 4.1
Water supplies — current and projected – acre-feet/year

Water Supply Sources		2010	2015	2020	2025	2030	2035 - opt
Supplier- purchased surface water[1]	**Wholesaler supplied volume?**						
Bureau of Reclamation	yes	32,000	32,000	32,000	32,000	32,000	32,000
Placer County Water Agency (PCWA)	yes	10,000	15,000	20,000	30,000	30,000	30,000
San Juan Water District (SJWD)	yes	4,000	4,000	4,000	4,000	4,000	4,000
Other water supplies:							
Supplier-produced groundwater[2]		0	0	0	0	0	0
Supplier-produced surface water		0	0	0	0	0	0
Transfers in		0	0	0	0	0	0
Exchanges In		0	0	0	0	0	0
Recycled Water		1,709	2,197	2,670	2,980	3,397	3,770
Desalinated Water		0	0	0	0	0	0
Total		47,709	53,197	58,670	68,980	69,397	69,770

[1]Water in this category is raw surface water delivered through existing contracts and agreements that are treated by City at the Roseville Water Treatment Plant
[2]Groundwater is only used for drought and shortage back-up in water supply planning. Although capability exists it is not planned for use to meet anticipated demands in normal water years.

As described, surface water supplies contracted by the City are either supplied from or delivered through Folsom Lake reservoir through agreements with the USBR. Water sources identified are included in Table 4.2.

Table 4.2 Wholesale supplies — existing and planned sources of water – acre-ft/year						
Wholesale sources	**Contracted Volume**	**2015**	**2020**	**2025**	**2030**	**2035 - opt**
Folsom Reservoir	32,000	32,000	32,000	32,000	32,000	32,000
American River Middle Fork Project delivered through Folsom Reservoir (PCWA and SJWD)	34,000	14,000	19,000	24,000	34,000	34,000
Total	66,000	46,000	51,000	56,000	66,000	66,000

Surface Water Supply Constraints

There are no physical constraints on the current surface water supplies that limit the ability to meet current and projected demands within the City's existing service area. The capacities of the Folsom Dam diversion, Roseville Water Treatment Plant plus current expansion, and distribution systems are sufficient to divert, treat, and convey the projected surface water demands. A 150 cubic feet per section (CFS) capacity limitation at the USBR pumping plant, agreed to based on pumping plant improvements made, is sufficient to provide water to meet Roseville's need.

The voluntary constraints on the current surface water entitlements are contract stipulations based upon terms within the Water Forum. The Water Forum resulted in a signed agreement that, although not legally binding, the City intends to comply with. This includes limitations on diversion amounts based on hydrologic year types. Based upon the Water Forum Agreement, the City has agreed to divert no more then 58,900 AFY during normal wet years and to take no more then 39,800 AFY during critically dry years.

Contract stipulations are placed on each of the City's contracts. The USBR CVP contracts are subject to limitations during "dry years" as determined by the USBR. The PCWA contract as well includes conditions as to when water supplies may be reduced due to hydrologic conditions. However, PCWA supplies are considered highly reliable absent a catastrophic event. The contract with SJWD for 4,000 acre-feet per year of PCWA water limits the availability to only wet or normal years as defined within the Water Forum Agreement.

The Water Forum Agreement was developed in an attempt to preserve the fishery, wildlife, recreational, and aesthetic values of the lower American River and also to provide a reliable and safe water supply for the region. The City is a signatory of the Water Forum Agreement and a member of the successor

effort.

The Water Forum Agreement diversion restrictions are dependant upon the March through November projected unimpaired flows to Folsom Lake reservoir. When the projected March through November unimpaired inflow into Folsom Lake is greater than 950,000 acre-feet, the City agreed to only diverting 58,900 acre-feet per year from Folsom Lake, which is less than full contract entitlement of 66,000 acre-feet. When the projected March through November unimpaired inflow into Folsom Lake falls between 950,000 acre-feet per year and 400,000 acre-feet per year the Water Forum considers these to be drier years. During drier years, the City agreed to divert a decreasing amount from 58,900 acre-feet per year down to 39,800 acre-feet per year from Folsom Reservoir in proportion to the decreasing unimpaired inflow to Folsom Lake. Driest years (also known as Conference Years or Critically Dry Years) are defined as years when projected March through November unimpaired inflow into Folsom Lake is less than 400,000 acre-feet per year. The City agreed to only divert 39,800 acre-feet per year during the driest years. When supplies are limited to the lower end of the Water Forum ramp, the City will also provide up to 20,000 acre-feet of re-operation water to the American River (equal to difference between 39,800 acre-feet and 1995 baseline demand of 19,800 acre-feet). The City has entered into an agreement with Placer County Water Agency (PCWA) whereby PCWA will modify operations of their reservoirs to provide the agreed upon flow into the American River for that year. During all supply reduction scenarios, the City will reduce the demand through additional conservation and supplement supplies with groundwater and recycled water use.

4.1.2 Groundwater

The City maintains groundwater wells for backup supply and dry year supply. The City is also in the process of obtaining permits for using its wells for aquifer storage and recovery (ASR) to store potable water in the aquifer making it available for use during other times. A Groundwater Management Plan (GMP) was completed in November of 2007 in cooperation with PCWA, City of Lincoln, and California American Water. A copy of this GMP is included in Appendix E.

Roseville is over the North American sub-basin of the Sacramento Valley Groundwater Basin. The North American sub-basin (DWR Groundwater Basin Number 5-21.64) is located in the eastern central portion of the Sacramento Groundwater Basin, encompassing portions of Sutter, Placer, and Sacramento Counties.

Groundwater elevation levels in the basin along the Placer/Sacramento County line have been

steadily declining 1 to 1.5 feet per year through the mid 1990's. Some of the largest decreases have occurred in the area of the former McClellan Air Force Base. From 1995, groundwater elevations were maintained and the declining elevation trend was dampened due to groundwater management activities stemming from the Water Forum Agreement restraining further increases in groundwater pumping and implementation of in-lieu banking in the region. Groundwater levels in Sutter and northern Placer counties generally have remained stable, although some wells in southern Sutter County have experienced declines.

In addition, the basin has historically been pumped by agricultural and urban users. Over the past ten years, agriculture land is being developed and converted to urban uses. With this conversion, the agriculture pumping demand will decrease. If the demand is not replaced by other pumping demands, it is anticipated that the basin pumping demands will decrease, potentially improving the condition of the basin.

Physical Constraints

The physical constraints on the current groundwater supply are the pumping capacities of existing wells. The total pumping capacities from all five wells are about 11.9 MGD. The City plans to install more wells in the future to provide backup and dry year supply, in addition to potential wet and normal year storage of potable water as described later in this chapter.

Legal Constraints

There are no existing legal constraints that limit groundwater pumping and the basin is not adjudicated. However, the legal authority to enforce the safe yield of the basin has not been created, and the basin is subject to the users' cooperation in managing the basin until a formal authority is created. These issues and concerns are being discussed as part of the Western Placer County Groundwater Management Plan along with management objectives and activities. The collaborative group of City of Roseville, PCWA, City of Lincoln, and California American Water are responsible for and has been identified as the responsible entity for monitoring groundwater levels meeting requirements of the 2009 SBx7-6 California Statewide Groundwater Elevation Monitoring (CASGEM) program. Information gathered as part of this program will be included in the groundwater model currently being developed to support the ASR application with the Regional Water Quality Control Board to determine impacts of proposed extractions and

injections related to groundwater levels in the region.

Historical Groundwater Production

Groundwater use is not a part of normal condition water supplies for the City. In support of the ASR program development, however, groundwater was extracted and delivered to customers within the service area. This was not a normal supply condition but driven by the ASR demonstration project as opposed to shortages requiring the supplemental water. Table 4.3 provides a description of the amount of groundwater pumped by the City for the past five years.

Table 4.3 Groundwater — volume pumped – acre-feet/year						
Basin name(s)	**Metered or Unmetered[1]**	**2006**	**2007[1]**	**2008[1]**	**2009**	**2010**
North American sub-basin of the Sacramento Valley Groundwater Basin (DWR Groundwater Basin Number 5-21.64)	Metered	0	1,468	392	0	0
Total groundwater pumped		0	1,468	392	0	0
Groundwater as a percent of total water supply		**0%**	**4%**	**1%**	**0%**	**0%**

[1]Groundwater use in 2007 and 2008 was driven by the ASR demonstration project as opposed to water supply shortages requiring the use of groundwater as a supplemental water supply source.

Future Groundwater Production

Roseville policy stipulates that groundwater will not be used as a consistent supply source within the service area but only for reliability in times of shortage. Therefore, groundwater use is not assumed as part of normal water supply conditions within the planning horizon through buildout of the service area. Table 4.4 documents this by showing zero groundwater supply pumping projections, as it is the City's intent that groundwater is not to be utilized as a normal water supply source over the next 25 years.

Table 4.4

Groundwater — volume projected to be pumped					
Basin name(s)	**2015**	**2020**	**2025**	**2030**	**2035 - opt**
North American sub-basin of the Sacramento Valley Groundwater Basin (DWR Groundwater Basin Number 5-21.64)	0	0	0	0	0
Total groundwater pumped	0	0	0	0	0
Percent of total water supply	**0%**	**0%**	**0%**	**0%**	**0%**

4.1.3 Conserved Water

Anticipating the importance placed on water in California and anticipating significant pressures to increase conservation activities in the future Roseville took action to lay claim to conserved water to strengthen the water portfolio. Under California water rights law, any quantity of water not used under an appropriative right is considered forfeited after five years of non-use. Water Code section 1011 provides that a holder of an appropriative water right may retain control of any water conserved from the supply that may be diverted under that right because conservation is considered a beneficial use of water. Water Code section 1011 is not directly applicable to the City because it receives its water supplies from several contractual entitlements, including a long term CVP water service contract, and contracts with SJWD and PCWA.

The City's CVP water service contract is governed by the Central Valley Improvement Act (CVPIA), Section 3405(a) of the CVPIA is similar to Water Code section 1011. Section 3405(a) permits the City to sell, exchange, or transfer conserved CVP water to other water users without forfeiting the City's entitlement to the quantity sold, exchanged or transferred and deems the transfer of water to be a beneficial use. However, the right to sell, exchange or transfer water conserved under the City's CVP contract is subject to certain terms and conditions set forth in the contract, including written approval by the Bureau of Reclamation of any sale, exchange or transfer of conserved water. The City's water supply contracts with PCWA and SJWD do not specifically address whether the City may retain control of water supplies that are conserved through conservation measures and the City realizes the need to negotiate this issue with those two agencies in the future.

On February 18, 2009 Roseville City Council passed a Resolution (Number 09-64), included in Appendix G, that declared the City's intent to retain control over all conserved water to the extent

permitted by law and its contractual rights and obligations. Although conserved water is not used in the plan at this time to meet the needs of the community it may be in the future and this action reflects the intent to utilize conserved water with in the service area.

4.2 Transfer Opportunities

Roseville maintains an on-demand treated water system that is used for municipal and industrial purposes. Roseville maintains direct treated water interties with four surrounding jurisdictions. Roseville can transfer water between jurisdictions through these interties or access water to supplement its distribution system. These facilities are designed to be used for wheeling water through the service area or for short-term demand shortage assistance. These exchanges or transfers are not considered long term and not included as long term or permanent opportunities.
The regional water master plan developed by the American River Basin Cooperating Agencies (Montgomery Watson, 2003) identifies several potential projects for transferring water. The City has constructed a 24-inch pipeline and connection on PFE Road for transferring water between agencies and is in the process of working through the details with other agencies as to how best to use this facility on a long term basis. This is the subject of ongoing discussion between agencies.

As a condition of the Water Forum Agreement, Roseville has entered into a re-operation agreement with PCWA for up to 20,000 acre-feet to be used during when Roseville's surface diversion is cut back. In general, the agreement calls for PCWA to release up to an additional 20,000 acre-feet to the American River on an annual basis during time of reduced water availability in the system. The water is to maintain flows in the Lower American River (Nimbus dam to Sacramento River), and therefore is not available for Roseville's use. This re-operation water is considered a transfer, although the ultimate user, if any, of the water has not been identified as part of the agreement, only that the water would be marketed when it was identified as available. It is possible there could be multiple users, as the water will flow to the Delta and theoretically be available to all Delta water users.
Also as a condition of the Water Forum Agreement conditions discussed earlier in section 4.1.1, Roseville has committed to not take the entire amount of contracted water. As a result of having 66,000 AF of water available through various contracts and a commitment to take no more than 54,900 AF from the American River watershed there is opportunity to find a long term transfer for the 7,100 AF with a user downstream of the confluence of the American and Sacramento Rivers.
Several transfer opportunities have been evaluated but none have been completed. A summary of the City's water supply transfer and exchange opportunities is provided in Table 4.5. The Water

Code definition of short and long-term conditions are that short-term is considered for a period of one year or less and long-term is for a period of more than one year.

Table 4.5 Transfer and exchange opportunities (AFY)			
Transfer agency	**Transfer or exchange**	**Short term or long term**	**Proposed Volume**
PCWA	Exchange	Long Term	net zero
PCWA (through re-operation agreement with Roseville)	Dry Year Transfer	Long Term	Up to 20,000
Bureau of Reclamation	Potential Exchange	Long Term	7,100
Total		Up to 20,000	7,100

4.3 Desalinated Water Opportunities

There are no opportunities for the development of desalinated water within the City's service area as a future supply source. The City is not located near any bodies of water that would allow the option.

4.4 Recycled Water Opportunities

The City of Roseville currently operates two regional wastewater treatment facilities that treat wastewater flow collected from the City of Roseville, South Placer Municipal Utilities District, and some areas of Placer County. This section provides information on the wastewater and its current and potential reuse as a recycled water resource in the City.

4.4.1 Recycled Water Plan Coordination

The City of Roseville, the South Placer Municipal Utility District, and Placer County are regional partners in the South Placer Wastewater Authority (SPWA). The SPWA was created in 2000 to oversee policy for funding regional wastewater and recycled water infrastructure. The City owns and operates two regional wastewater treatment facilities on behalf of the regional partners. These treatment facilities are the Dry Creek Wastewater Treatment Plant (Dry Creek WWTP or DCWWTP) and the Pleasant Grove wastewater treatment plant (Pleasant Grove WWTP or PGWWTP). Both plants produce a Title 22 quality effluent that meets the requirements for "full unrestricted reuse" that is available for recycled water applications.

The City has prepared the South Placer Regional Wastewater and Recycled Water Systems Evaluation (Systems Evaluation, updated December 2009), which delineates the 2005 regional wastewater service area boundary (2005 SAB) and provides baseline and projected characterizations of its regional wastewater and recycled water systems. The 2005 SAB is shown in Figure 4-1.

FIGURE 4-1

2005 SPWA SERVICE AREA BOUNDARY

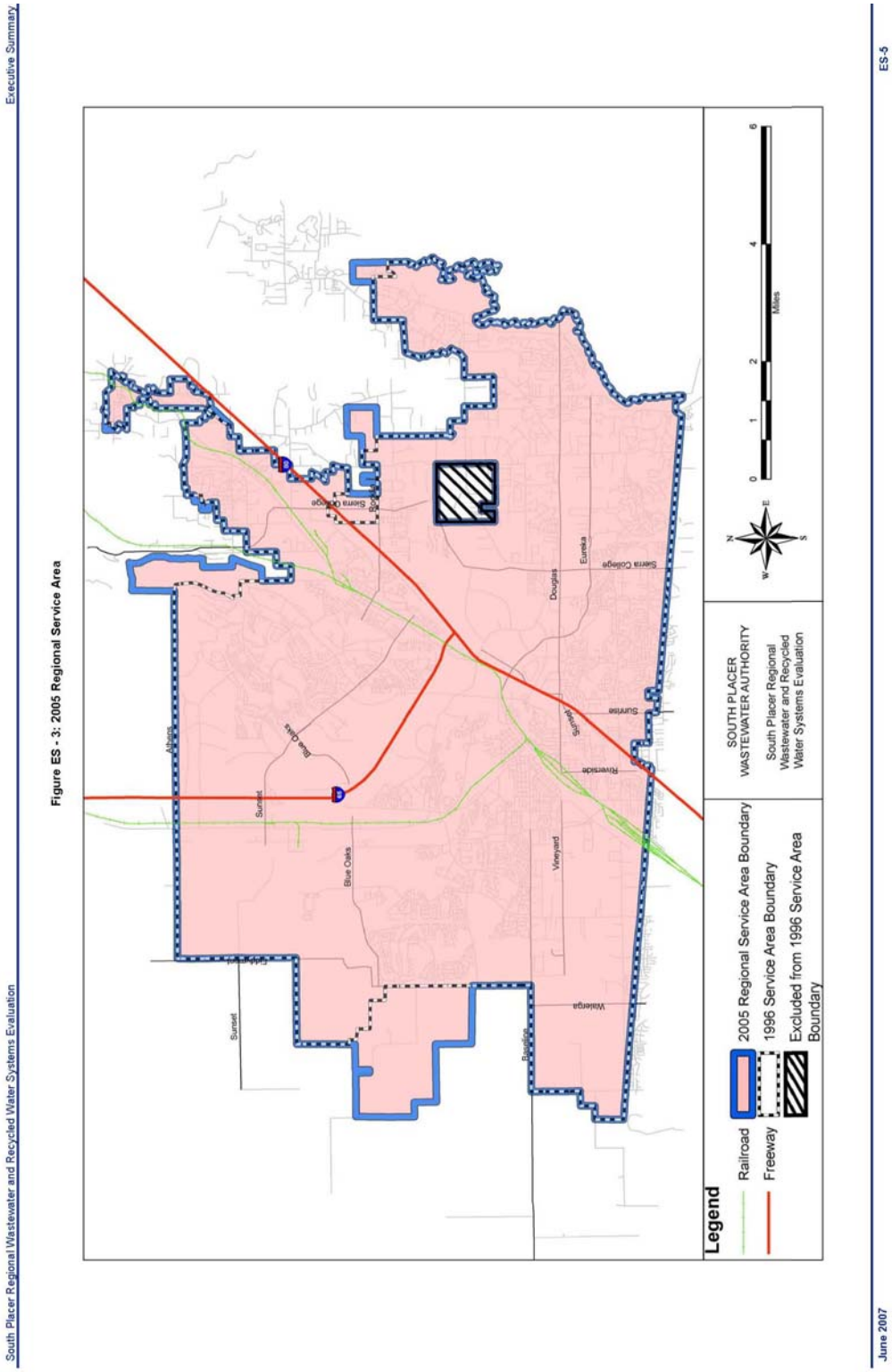

Figure ES - 3: 2005 Regional Service Area

The Recycled Water Systems Evaluation, of the Systems Evaluation report was conducted to assist in the ongoing expansion of a regional water recycling system. The goal of utilizing recycled water supplies is to promote responsible water supply management by beneficially reusing available disinfected tertiary treated Title 22 recycled water for irrigation use in order to free up surface water and groundwater supplies for potable uses. Since its initial publication, the June 2007 Recycled Systems Evaluation Report has been updated with new information regarding urban growth areas. Tech Memos 5a and 5b (Market Assessment for Recycled Water Systems and Alternatives Development and Evaluation for Recycled Water Distribution System, respectively) were updated February 11, 2008 and incorporated into the December 2009 updated Final Report and included in Appendix F. All agency elements for a reuse program within the City boundary, including land planning, development, wastewater treatment, and water supply, are all part of the City of Roseville government organization.

4.4.2 Existing Wastewater Collection and Treatment

The City of Roseville handles wastewater collection within the service area corresponding to the City incorporated boundaries. Wastewater collection within the 2005 SAB but located outside of the City's service area is handled through individual agency staffs (Placer County and South Placer Municipal Utility District). Roseville handles collection within the service area corresponding to the City incorporated boundaries. Other surrounding agencies that are also part of the regional facility collect wastewater which is conveyed through trunk sewers to the regional treatment facilities. Metering stations are located at service area boundaries to account for the wastewater treated for each entity. The City of Roseville currently operates two regional wastewater treatment facilities; the Dry Creek wastewater treatment plant (DCWWTP) and the Pleasant Grove wastewater treatment plant (PGWWTP). As their names imply, The DCWWTP discharges disinfected tertiary treated effluent to Dry Creek while the PGWWTP discharges to Pleasant Grove Creek. The two City of Roseville wastewater treatment plants serve an area that is larger than the City of Roseville. The service area, referred to as the SPWA 2005 Service Area Boundary, encompasses areas served by Placer County and the South Placer MUD (SPMUD) as shown in Figure 4.1, above.

The DCWWTP provides tertiary-level wastewater treatment through the process of screening, grit removal, primary clarification, aeration, secondary clarification, filtration and ultraviolet disinfection; in addition, the DCWWTP provides full nitration and de-nitrification. Tertiary treated wastewater from the DVWWTP meets Title 22 regulations for full, unrestricted use. The current average dry weather flow (ADWF) is approximately 10 million gallons per day (mgd), of which

approximately 6 mgd come from the City of Roseville. The peak daily wet weather flow (PWWF) during the last 12 months was 28 mgd. The plant can discharge up to 18 mgd ADWF and 45 mgd PWWF into Dry Creek under an existing National Pollutant Discharge Elimination System (NPDES) permit No. CA0079502 adopted on June 12, 2008. The DCWWTP currently produces 850 AFY of recycled water that is used within the City's service area boundary for irrigation purposes.

The PGWWTP currently treats approximately 7 mgd ADWF with approximately 4 mgd coming from the City of Roseville and the remainder coming from the South Placer Municipal Utilities District (SPMUD) and parts of Placer County. The PGWWTP provides tertiary-level treatment through the process of screening, grit removal, extended aeration, secondary clarification, filtration, chlorination (for recycled water), and ultraviolet disinfection (for discharge to Pleasant Grove Creek). The plant provides full nitrification and de-nitrification, as well as produces recycled water that meets Title 22 regulations for full, unrestricted use. The PGWWTP is presently authorized to discharge treated effluent into Pleasant Grove Creek under the National Pollutant Discharge Elimination System (NPDES) Permit No. CA0084573 adopted on June 12, 2008. Under this permit the PGWWTP can discharge an ADWF of 12 million gallons per day (mgd) increasing to a permitted ADWF discharge of 15 mgd upon completion of additional treatment facilities. The PGWWTP currently produces 859 AFY of recycled water that is used within the City's service area boundary for irrigation purposes.

As described above, both treatment plants are regional wastewater facilities and as such, wastewater is generated both inside of and outside of the City from a combination of residential and non-residential sources. Estimates of the wastewater flows generated within the service area and for the City-specific boundary for the present and future conditions were analyzed within the South Placer Regional Wastewater and Recycled Water Systems Evaluation (Systems Evaluation, updated December 2009. Tables 4.6a and 4.6b provide a summary of the volume of wastewater processed at each of the City's wastewater treatment plants in 2005 and 2010 and projects the volume of wastewater expected to be treated at each plant over the next 25 years. Table 4.6a, represents regional wastewater flows expected at each plant while Table 4.6b represents the amount of wastewater from within the City's service area only.

Table 4.6a Recycled water — wastewater collection and treatment Regional wastewater flows (AFY)							
Type of Wastewater	**2005**	**2010**	**2015**	**2020**	**2025**	**2030**	**2035 - opt**
Wastewater collected & treated in service area – DCWWTP	12,448	11,481	11,134	12,017	13,143	13,905	15,018
Wastewater collected & treated in service area - PGWWTP	7,464	8,440	9,512	10,783	12,610	13,784	14,728
Volume that meets recycled water standard	19,912	19,921	20,646	22,800	25,753	27,689	29,746

Table 4.6b Recycled water — wastewater collection and treatment Local City of Roseville wastewater flows (AFY)							
Type of Wastewater	**2005**	**2010**	**2015**	**2020**	**2025**	**2030**	**2035 - opt**
Wastewater collected & treated in service area – DCWWTP	6,846	6,314	5,857	6,281	6,910	6,934	6,934
Wastewater collected & treated in service area - PGWWTP	4,105	4,642	6,668	8,036	9,464	10,432	11,146
Volume that meets recycled water standard	10,951	10,956	12,525	14,317	16,374	17,366	18,080

Table 4.7 summarizes how the tertiary treated wastewater generated from each regional wastewater facility is currently or is projected to be used. It includes use as recycled water supplies, required environmental discharges and then remnant effluent discharges. Recycled water uses represent the demands the City has determined are economically feasible to serve within the City's service area boundary including recently approved specific plans (Sierra Vista and Creekview). The City is required to maintain four million gallons per day discharge into Dry Creek as an in-stream flow requirement; however, there are no in-stream flow requirements for Pleasant Grove Creek. These flows are shown in the table 4.7 below as environmental discharges. The potential recycled water usage is that amount of flow that will be discharged to the two creeks but is not currently assigned to a "demand" since the City has not identified specific regional or downstream uses at this time for the

excess flow. Total potential recycled water that could be made available for use is then the total wastewater generated minus existing/planned recycled water demands, minus environmental discharges.

Table 4.7 Recycled Water Availability (AFY)							
Method of disposal	**Treatment Level**	**2010**	**2015**	**2020**	**2025**	**2030**	**2035 - opt**
DCWWTP							
Recycled Water Demands	Tertiary	850	527	641	715	815	905
Environmental Discharge	Tertiary	4,480	4,480	4,480	4,480	4,480	4,480
Available for use	*Tertiary*	*6,151*	*6,127*	*6,896*	*7,948*	*8,610*	*9,633*
PGWWTP							
Recycled Water Demands	Tertiary	859	1,670	2,029	2,265	2,582	2,865
Environmental Discharge	Tertiary	0	0	0	0	0	0
Available for use	*Tertiary*	*7,581*	*7,842*	*8,754*	*10,345*	*11,202*	*11,863*
	Total	**13,732**	**13,969**	**15,650**	**18,293**	**19,812**	**21,496**

Recycled water use is an element in the City's water supply portfolio for normal year supplies, as identified in Table 4.1, as well as during drought and emergencies. Table 4.8 summarizes how recycled water demands identified in Table 4.7 are expected to be utilized over the next 25 years. Total recycled water used listed in Table 4.8 for 2015-2035 represents the demands the City has determined are economically feasible to serve within the City's service area boundary and those recently approved specific plans (Sierra Vista and Creekview). These projected demands do not include potential uses located outside of the City's corporate boundary.

It is important to realize that the City has maximized the use of recycled water. For example, the highest demand for recycled water is in the month of July, the same time the recycled supply is the lowest. To use the recycled water listed as "Potential", the City would have to "bank" or store the water produced in the winter months when there is no demand. The storage volume necessary would depend on actual demand requirements, but at this time, winter storage requirements are

considered too large to be economically feasible. The City will continue to evaluate in-City and regional recycled demands and consider its ability to provide recycled water for future projects.

Table 4.8 Recycled water — potential future use (AFY)							
User type	**Description**	**Feasibility**	**2015**	**2020**	**2025**	**2030**	**2035**
Agricultural irrigation	Recycled water to serve agricultural irrigation needs	Not a part of current service area. Consideration to be made as opportunities presented. Key challenge is transportation and delivery mechanism to customers.	TBD	TBD	TBD	TBD	TBD
Landscape irrigation	Recycled water to serve landscape irrigation needs	Currently planned to match recycled water available in peak irrigation season	2,197	2,670	2,980	3,397	3,770
Commercial re-use	Use for commercial application other than irrigation needs.	Recycled water use considered as opportunities presented. Barriers include expense of retrofit for existing community as well as operational expenses for compliance.	TBD	TBD	TBD	TBD	TBD
Wildlife habitat /Wetlands	Use of recycled water for environmental purposes	Restrictions on use allow no discharge which limits potential sites available for consideration. Amounts shown based on 4MGD discharge requirement for Dry Creek Wastewater Treatment Plant.	4,480	4,480	4,480	4,480	4,480
Industrial reuse	Use for industrial application other than irrigation needs.	Recycled water use considered as opportunities presented. Barriers include expense of retrofit for existing community as well as operational expenses for compliance	TBD	TBD	TBD	TBD	TBD
Groundwater recharge	Use of recycled water for recharge of groundwater either through spreading basins or direct injection	Suitable areas based on proximity and impermeable soil conditions make spreading basins infeasible. Direct injection could be considered as part of future studies on groundwater stabilization but considered infeasible based on current regulations.	TBD	TBD	TBD	TBD	TBD
Seawater barrier	Use of recycled water for groundwater injection as barrier to seawater intrusion	Service area not geographically situated to provide water for use.	0	0	0	0	0
Geothermal/Energy	Use of recycled water for energy generation cooling and/or steam production	Roseville provides entire cooling water needs to owned energy production facility with recycled water. Quantity used based on facility run time based on power production. Estimates are based on 1MGD for entire year to show the maximum that could be realized. No additional facilities are within service area.	1,120	1,120	1,120	1,120	1,120
Indirect potable reuse	Use of highly treated recycled water in the raw water supply source	Not considered at this time due to institutional barriers and high cost of implementation.	TBD	TBD	TBD	TBD	TBD
		Total	7,797	8,270	8,580	8,997	9,370

4.4.3 Water Recycling Current Uses

The City of Roseville's recycled water program predominately relies on landscape irrigation for its customers. The City of Roseville currently delivers recycled water to four golf courses, several parks, two schools, and several miles of streetscape for landscape irrigation. The City of Roseville also delivers recycled water to the Roseville Energy Park for industrial cooling. Landscapes at both regional treatment plants utilize recycled water for irrigation purposes.

Table 4.9 provides a comparison of the 2010 actual use of recycled water as compared to what was projected for use in 2010 in the 2005 UWMP. The projected versus actual use varies by 2,359 AFY. The predominant reason for the large variance is the significant economic slow down that has resulted in a major reduction in new development projects within the City.

Table 4.9
Recycled water — 2005 UWMP use projection compared to 2010 actual (AFY)

Use type	2010 actual use	2005 Projection for 2010
Agricultural irrigation	0	0
Landscape irrigation[1]	1,709	2,479
Commercial Re-use	0	0
Wildlife habitat/ Wetlands	0	0
Industrial reuse	0	1,920
Groundwater recharge	0	0
Seawater barrier	0	0
Getothermal/Energy	0	0
Indirect potable reuse	0	0
Total	**1,709**	**4,399**

[1]Includes parks, schools, churches, Multifamily residential, golf courses and streetscapes

4.4.4 Optimizing the Use of Recycled Water

It is the policy of the City that where the use of recycled water is feasible, appropriate, and acceptable to all applicable regulatory agencies, the City will require an owner or customer to use recycled water in lieu of potable water. The City has other methods of encouraging recycled water use including a rate discount and public education. The recycled water rate for customers is currently 50 percent of the potable water rate. The reduced rate represents a long-term cost savings to the customer. For example, an eighteen-hole golf course could save thousands of dollars per month using recycled water in lieu of potable water. The City currently does not charge a connection fee for connecting to the City's recycled water system. This also represents

substantial cost savings to irrigation customers. The City also implements an extensive public education campaign to educate its customers about the reliability and other benefits of recycled water. Another major benefit to customers of using recycled water is that it can be used in times of drought. In the event the City imposes drought restrictions on irrigation water use, recycled water is exempt from these restrictions. Recycled water use is not restricted due to the fact that even during a drought, recycled water supplies are generally not affected to the point that shortages would result.

The target of future recycled water use is towards new development. A major hindrance to expanding use of recycled water in existing developments is the lack of infrastructure. Installing new infrastructure in existing areas is exceedingly expensive. Due to this, the City requires use of recycled water for all commercial irrigation services in newly developing master planned areas. This is feasible because recycled water infrastructure can be built as a part of the original project. The 2005 South Placer Regional Wastewater and Recycled Water Systems Evaluation identified customers and projected demands at build out. It is estimated that 85 - 95% of all available recycled water will be utilized during the peak irrigation season. The remaining supply is needed for operation flexibility and also for infill customers not originally identified.

4.5 Future Water Projects

The City is currently planning to implement a variety of Capital Improvement Projects to increase reliability, meet projected water use, and provide dry year supplies. These improvements are included in the following discussion based on improvement type.

4.5.1 Water Supply Facilities

Roseville has made improvements to the Folsom Dam pumping station and the raw water delivery system to meet the needs of the City through projected build out. No additional supply capacity is currently anticipated or planned for. In 2010 a major project to increase reliability was completed. At the request of the USBR, Roseville and other water purveyors that receive Folsom Lake water constructed a parallel raw water pipeline on USBR property to allow for maintenance of the existing pipeline, adding additional operational flexibility required for maintenance. This project is seen as a major improvement to this critical facility.

4.5.2 Water Treatment Facilities

Roseville's water treatment plant expansion from 60 mgd to 100 mgd was completed in 2008. The purpose of the expansion was to improve system reliability, daily peaking requirements, and regional conjunctive use strategies. The expanded plant capacity is sufficient to meet the planned development within the City of Roseville through buildout of the community.

The City is also part of a group of agencies that are studying the construction of a new water treatment facility on the Sacramento River, led by PCWA. The new treatment plant will allow access to USBR water without impacting the Lower American River, which is consistent with the Water Forum Agreement. Roseville plans to receive 10 mgd of capacity from this new plant when it is constructed. This project has been put on hold indefinitely, pending resolution of water supply strategy developments by City of Sacramento, another major partner in this project.

4.5.3 Water Storage Facilities

Water storage capacity is required to manage flow fluctuations in the system on a daily basis and maintain sufficient storage to address emergency needs such as main breaks or fire flows. The water system currently has 32 million gallons (MG) of storage and is projected to need a total of 49 MG at system build out. Storage projects currently in the capital plan along with the anticipated schedule are listed in Table 4.11. None of the storage projects are expected to increase total water supplies.

Table 4.10
Future water storage projects

Project Name	Tank Volume (MG)	Projected Completion Date
West Side Tank	6	2015
Sierra Vista Tank	5	2022
North Industrial Tank	6	2018
Total	**17**	

MG = Million Gallons

4.5.4 Water Distribution Facilities

Water transmission facilities have been mostly completed within the City of Roseville with exception to the annexation area which has no existing infrastructure and all is planned as part of the project development. Annexation area infrastructure has been conceptually designed and sized with timing

identified in a phasing plan linked to development. This infrastructure will be constructed by the developer with design approval and construction oversight by the City of Roseville. Infrastructure improvements will be made through the 15-year build out of the annexation area and will include looped transmission and distribution mains to meet the needs to the community.

4.5.5 Groundwater Wells

Groundwater wells are currently only utilized for backup and dry year water supplies. In order to prepare for shortages in the future and eventual use of conjunctive use programs currently being studied, additional wells are being planned for the system. Each well is planned to produce a nominal 1,800 gallons per minute (gpm) with final production identified upon drilling and well development. When wells are used for backup or dry year supply, it is anticipated that they will only be run for short periods of time (in the case of backup), and for only a portion of the year (in the case of dry year supply). All wells will be constructed with capability to recharge the aquifer directly with treated surface water as a key element required for conjunctive use programs. Groundwater well projects currently in the City's capital plan along with the anticipated schedule are listed in Table 4.12.

Table 4.11
Future groundwater well projects

Project Name	Production (gpm)	Projected Completion Date
Sun City Well	1,800	2016
West Roseville Specific Plan – 4 Wells	7,200 (1,800 each well)	2013 - 2015
Sierra Vista Specific Plan (Annexation Area) – 2 Wells	3,600 (1,800 each well)	2018 - 2020
Creekview Specific Plan	1,800	2020
Total	**14,400**	

gpm = gallons per minute

It is the City's policy that groundwater is only used as water supply in times of shortage. Even so, the construction of new groundwater wells could be considered as water supply projects. Therefore, projected water supplies from well construction are included in Table 4.13. Projected supply assumes each well would be run on a continuous basis (e.g. 24-7).

Table 4.12 Future water supply projects – (AFY rounded)								
Project name	Projected start date	Projected completion date	Potential project constraints	Normal-year supply	Single-dry year supply	Multiple - dry year		
						First year supply	Second year supply	Third year supply
Sun City Well	2015	2016	Continued economic conditions may delay project	0	2,900	2,900	2,900	2,900
WRSP Wells	2013	2015		0	11,600	11,600	11,600	11,600
SVSP Wells	2018	2020		0	5,800	5,800	5,800	5,800
CSP Well	2020	2021		0	2,900	2,900	2,900	2,900
SRWRS	2030+			7,100	0-7,100	0-7,100	0-7,100	0-7,100
Total				7,100	23,200	23,200	23,200	23,200

4.5.6 Aquifer Storage and Recovery (ASR)

With an objective of creating a reliable water system to meet the needs to the community, Roseville has invested in development of an ASR program that will utilize constructed water infrastructure along with existing water supplies to increase reliability. All wells constructed will include features that will allow injection of surface water from the distribution system into the groundwater aquifer. This will allow the City to take surface water sources that are available, treat it and then inject it into the groundwater aquifer for later use. This will allow use of the groundwater basin without impacting water stored. Water available for storage could be from a variety of sources with a variety of operational scenarios.

Water availability for treatment and storage could be from unused allocations consistent with the Water Forum Agreement diversion limitations. In addition, during wet times section 215 flood control spill water may also be available. Since flood control spill does not usually correlate with peak demand, banking water through ASR provides the perfect opportunity to capture this water for use when needed. These operations may result in water diversions in excess of customer demands but stored for later use which may be in later calendar years. By using the capacity of the treatment facility in low demand times it may be possible to treat and store and additional 5,500 AF of water for later use.

ASR operations can also be used to reduce strain on the facility during peak delivery times. By diverting and treating water in the low demand times of the year and storing water for use in peak times of the year it is possible to increase the reliability of the system by not requiring treatment facilities to be operated at peak production for extended periods. Although this operational strategy would not change the total water taken during the year it would change the timing of the diversions from Folsom Lake and use stored water from the groundwater basin to meet customer demands. Using this strategy it may be possible to change the pattern of water withdrawal from Folsom Reservoir from peak demand times in the summer to better water availability times in the winter. Again, this would not result in additional water being available on an annual basis.

SECTION 5
Water Supply Reliability and Water Shortage Contingency Planning

Section 5 describes the reliability of the water supply and vulnerability to seasonal or climatic shortage and the City's contingency plans in times of supply shortfalls.

5.1 Water Supply Reliability

The City of Roseville currently supplies surface water for municipal and industrial (M&I) uses. This requires firm surface water contract amounts to ensure that proper supplies are maintained for the residences and businesses relying on the water supply. As described in Section 4, the City maintains surface water supply contracts totaling 66,000 AFY with the USBR, PCWA and SJWD. Contract restrictions on USBR CVP water are enforced during "dry" years and it is assumed that CVP water will be reduced to 75 percent of contracted amount for each water supply scenario. Contract water supplies from PCWA and SJWD are from Middle Fork Project (MFP) water supplies. PCWA has conducted analyses that indicated MFP water is reliable even in drought conditions. Besides the USBR contract stipulation of reductions during dry years, the only other voluntary constraints on the City's current surface water entitlements are contract stipulations based upon terms within the Water Forum Agreement (WFA). WFA restrictions do not apply to specific contracts or entitlements, but are applied to the City's surface water use as a whole. Restrictions are based on the terms as described in Section 4. In summary, the City can divert between 39,800 acre-feet per year and 58,900 acre-feet per year of American River water in "drier" years and 39,800 acre-feet or less in "driest" years as defined in the WFA. Based on over 70 years of historical hydrology of the American River, an analysis was performed as part of the WFA and concluded the City's contract surface water supply would be available pursuant to the City's purveyor-specific WFA. In times of drought and water shortage, the Water Forum analysis also assumed that urban demand would decrease as a result of increased conservation awareness and regulations and surface water supplies would be supplemented with groundwater. It is expected that if the supply were to be reduced due to shortage, consistent with reductions identified in the WFA, existing surface water supply, coupled with conservation, groundwater and continued recycled water use will be sufficient to meet citywide demands. Table 5.1 provides a summary of factors that could result in water supply limitations.

Table 5.1 Potential factors resulting in inconsistency of supply							
Water supply sources[1]	**Specific source name, if any**	**Limitation quantification**	**Legal**	**Environ-mental**	**Water quality**	**Climatic**	**Additional information**
Bureau of Reclamation	CVP delivered Folsom Lake	24,000 – 32,000 based on Folsom Unimpaired Inflow	Contract and Water Forum Agreement	None currently identified	None currently identified	Drought	Contract restrictions on CVP water are enforced by the USBR during "dry" years. It is assumed that the CVP water will be reduced by up to 75 percent of contract.
Placer County Water Agency (PCWA)	MFP delivered through Folsom Lake	0 – 50,000[2] based on Folsom Unimpaired Inflow	Water Forum Agreement	None currently identified	None currently identified	None Considered	Water supply reliability analyses prepared by PCWA on its MFP water supplies conclude that this supply has historically been very reliable, even during drought periods. The conclusions of PCWA analysis is that the MFP can provide 120,000 AFY, even in dry years as severe as what occurred ruing 1976-1977. As such this water supply is assumed available in all water years.
San Juan Water District (SJWD)	MFP delivered through Folsom Lake	0 – 4,000 based on Folsom Unimpaired Inflow	Water Forum Agreement	None currently identified	None currently identified	Drought	This is a wet year water supply only per the City's contract with SJWD. This water is only available during normal and wet years.
Groundwater	North American River Groundwater Sub-basin	Potential Safe Yield of Groundwater Basin	West Placer Regional Groundwater Management Plan	None currently identified	None currently identified	None Considered	This groundwater system is being managed for emergency and drought contingency reliability. ASR is being developed to further enhance this resource.
Recycled Water	Roseville Regional Wastewater Treatment Facilities	Wastewater Average Dry Weather Flows during month of July	Recycled Water permit requirements	None currently identified	None currently identified	Facility design may limit some users for winter use periods	Recycled water is available in all year types. Short term supply shortages could result from potential wastewater treatment plant disruptions. In the event of a disruption, potable water is utilized as a back up supply if needed.

[1]Water Forum Agreement is a voluntary memorandum of understanding signed by the City of Roseville
[2]Includes 30,000AF contract water as well as 20,000AF Re-operation water as identified in the Water Forum Agreement

The City's water system is completely "on-demand", as is typical of many urban water systems. During normal years, water supplies from Folsom Lake are sufficient to meet the contractual obligations, and the City has sufficient quantities, either directly from USBR or wheeled through Folsom Lake from PCWA, to meet the needs of the community. During times of drought, water allocations may be reduced, resulting in restrictions on all water used within the City. The City has developed policies to address the potential of water shortages as described below.

5.2 Water Quality Constraints

Water quality affects the City's water management strategies through the City's efforts to be in compliance with Federal and State regulations. These regulations require rigorous water quality testing, source assessments, and treatment compliance. Water quality issues are not anticipated to have significant impact on water supply reliability for the City's water supply sources. At this time, there are no known surface water quality issues that could impact availability or reliability. Surface water will continue to be treated to drinking water standards, and no raw water quality deficiencies are foreseen to occur in the next 25 years.

Groundwater quality data shows groundwater within the City to meet or exceed potable drinking water standards. It is assumed that any localized groundwater contamination can be isolated and/or mitigated by constructing new treatment facilities for treatment prior to delivery into the water distribution system. No groundwater treatment systems are currently utilized nor are planned. All groundwater supplies currently meet or exceed current drinking water standards, including secondary standards regulated for aesthetic qualities. Iron and manganese are two metals that occur naturally within the geological formations from which the groundwater is extracted, and are known to be at elevated levels in wells of surrounding water systems. The City does not anticipate that iron and/or manganese will impact their groundwater supply quality or availability.

The City is currently applying for permits from the State for implementing aquifer storage and recover (ASR). ASR would allow for the injection of treated drinking water into the groundwater basin for withdrawal at a later time. The City does not anticipate that ASR operations will adversely impact the groundwater quality and in some instances may increase the aesthetic qualities of the water produced. If permitted, the City will conduct the required water quality testing as defined by the State. No other special water management strategies due to water quality are anticipated.

Recycled water supplies are generated from tertiary treated wastewater meeting Title 22 requirements for full unrestricted use. There are no currently known recycled water quality issues that could impact availability of this supply source. The City will continue to conduct required recycled water quality testing as required to meet Title 22 standards. No other special water management strategies due to water quality are anticipated, as referenced in Table 5.2.

Table 5.2
Water quality — current and projected water supply impacts (AFY)

Water source	Description of condition	2010	2015	2020	2025	2030	2035 - opt
Surface Water	No water quality issues known or anticipated	0	0	0	0	0	0
Groundwater	No water quality issues known or anticipated	0	0	0	0	0	0
Recycled Water	Meets Title 22 requirements for full unrestricted use	0	0	0	0	0	0

5.3 Water Shortage Contingency Planning

Based on historical information, current water supplies, and projected supply availability, the City does not anticipate having more than a 25-percent shortage over a three-year consecutive dry-year period. However, as part of this UWMP, the City has considered possibilities of shortage and outages that could affect water supply. Water shortage contingency planning includes actions to be implemented during a catastrophic interruption of water supplies including but not limited to regional power outage, earthquake, fire, flooding or other disasters. The City's shortage contingency plan notes that long-duration shortages are handled through implementation of a drought contingency plan, and short-term disruptions are addressed through use of existing water system storage and water system interties with adjacent jurisdictions. In the event these supplies are not sufficient or available to meet short-term needs, groundwater will be used to supplement water demands.
The Water and Energy Conservation component of the City of Roseville General Plan encourages resource conservation and protection, and the City provides a comprehensive program to encourage conservation. The City has implemented various strategies and plans to minimize the use of potable water in order to operate effectively under drought conditions.

In 1991, the City developed and adopted the Roseville Water Conservation and Drought Mitigation Ordinance. Under this ordinance, the City has authority to declare water shortage conditions and implement drought related mitigation measures. The City can initiate this process by declaring a drought stage (Stage One through Stage Five) and imposing the appropriate and corresponding drought response measures. For example, Stage One prohibits washing of streets, driveways, sidewalks, and parking lots and places restrictions on vehicle washing, and serving water in restaurants. Under Stage Two, additional measures on landscape irrigation would be imposed. Depending on the severity during Stage Three, Four, and Five drought restrictions the use of groundwater could also be initiated. Stages One through Five, as outlined in the City's Municipal Code Chapter 14.09, cover supply shortages up to 50 percent. Current water shortage contingency measures can be found in Appendix H. In an effort to achieve regional consistency with measures and drought messaging, the City is considering modification of the measures, determinations and declarations associated with water shortages. At this time language is being considered but has not been adopted. Measures included, however, will still address shortages of up to 50 percent.

In February 2008 the City of Roseville adopted Ordinance 4629, which added Sections 14.09.200-14.09-220 and amended Sections 14.09.020 – 14.09.110 of the Roseville Municipal Code regarding water conservation. The purpose of the ordinance is to ensure compliance with all federal, state and local requirements relating to water conservation and drought mitigation by:

- Reducing water consumption throughout the City during years of normal precipitation and during years of drought;
- Protecting and conserving the City's supply of water during times of emergency and/or crisis; and
- Minimizing and/or eliminating the waste through voluntary compliance or punitive action, if necessary.

By way of example, on April 30, 2008, the City of Roseville's Environmental Utilities Department activated a Stage One Water Conservation Level within the Roseville City limits in response to a letter received from the United States Bureau of Reclamation (USBR) which reduced Roseville's water supply for the 2008 calendar year by 25 percent. On February 20, 2009 the drought stage was increased to a Stage Two Water Conservation Level in response to a declaration by the California Governor for measures to result in a 20 percent savings. This stage remained until

October of 2010 when the drought order was rescinded due to sufficient water supply conditions. Mandatory water use prohibitions per the City's ordinance are outlined in Table 5.3 below. The ordinance text can be found in Appendix J.

Table 5.3 Water shortage contingency — mandatory prohibitions	
Examples of Prohibitions	**Stage When Prohibition Becomes Mandatory**
A. Water shall be confined to the user's property and shall not be allowed to runoff to adjoining properties, or to the roadside or to the gutter. Care shall be taken not to water past the point of saturation. B. Free-flowing hoses for all uses are prohibited. Automatic shut-off devices shall be attached on any hose or filling apparatus in use. C. Leaking pipes or faulty sprinklers shall be repaired within five calendar days or less if warranted by the severity of the problem as determined in the discretion of the director or his or her designee. D. All pools, spas, and ornamental fountains/ponds shall be equipped with a recirculation pump and shall be constructed to be leak-proof. Pool draining and refilling shall be allowed only to the extent required for health, maintenance, or structural considerations, and must otherwise comply with all applicable federal, state and local stormwater management program requirements, including, but not limited to, the urban stormwater quality management and discharge control ordinance set forth in the City of Roseville Municipal Code. E. Landscaping. 1. All landscaping installed in the City of Roseville shall comply with the water efficient landscape requirements adopted by resolution of the city council. 2. This section shall not apply to landscaping installed for single-family homes, except for developer-installed landscaping, or to landscaping for cemeteries. F. Water Reclamation. All site reviews shall include an evaluation of water reclamation and recycling, and use of reclaimed water from the city shall be required if economically feasible.	**Basic Stage:** During the basic water conservation stage water shall be used for beneficial purposes only with all unnecessary and wasteful uses of water are prohibited.
A. All basic stage restrictions shall continue in place, except to the extent they are replaced by more restrictive conditions imposed by this section. B. All city users are to reduce water use by 10 percent. C. Washing streets, parking lots, driveways, sidewalks or buildings, except as necessary for health or sanitary purposes, is prohibited. D. Restaurants. Water shall not be served at restaurants except by request. E. Water shortage surcharges shall be implemented as set forth in Roseville Municipal Code Section 14.08.095.	**Stage One:** City's water supply is adequate to meet 90 percent of projected demands
All basic stage and stage one restrictions required shall continue in place, except to the extent they are replaced by more restrictive conditions imposed by this section. B. Residential users shall reduce water usage by 20 percent. C. Nonresidential users (including without limitation, commercial,	**Stage Two:** City's water supply is adequate to meet 80

industrial, church and publicly-owned users) shall reduce irrigation by 30 percent for existing landscaping. D. Washing of vehicles or boats is prohibited except: 1. When using a hose that is equipped with a control nozzle capable of completely shutting off the flow of water except when positive action or pressure to maintain the flow of water is applied, or 2. When washed in either an automatic or manual commercial car wash. This exemption does not apply to temporary car washes, held for fundraising purposes, or to any car wash in which the water is applied via a hand held garden type (non-pressure) hose. E. Water shortage surcharges and excess water use charges shall be implemented as set forth in Roseville Municipal Code Section 14.08.095.	percent of projected demands
All basic stage, stage one and stage two restrictions required shall continue in place, except to the extent they are replaced by more restrictive conditions imposed by this section. B. Residential users are to reduce water usage by 30 percent. C. Nonresidential users (including without limitation, commercial, industrial, church, and publicly owned users) shall reduce irrigation by 50 percent for existing landscaping. D. New or expanded landscaping is limited to drought-tolerant trees, shrubs, and ground-cover. No new turf or grass shall be planted, hydroseeded, or laid. E. Except where reclaimed water is used, golf course fairways shall not be watered. One-half of the turf areas in all city parks and median strips shall not be watered. F. All decorative fountains, decorative pools (i.e., non-swimming), and decorative waterways shall be drained and made dry. Such fountains, pools, and waterways shall not be refilled until the city has returned to the basic water conservation stage. G. Construction Water. Except where reclaimed water is used, use of water for dust control shall be augmented by hardened, temporary travel routes. Non potable water shall be used to the greatest extent possible. H. Swimming Pools. If drained, such swimming pools shall not be refilled until the city has returned to the basic water conservation stage. I. Water shortage surcharges and excess water use charges shall be implemented as set forth in Roseville Municipal Code Section 14.08.095.	**Stage Three:** City's water supply is adequate to meet 70 percent of projected demands
All basic stage, stage one, stage two, and stage three restrictions required shall continue in place, except to the extent they are replaced by more restrictive conditions imposed by this section. B. Residential customers are to reduce water usage by 40 percent. C. All nonresidential users (including without limitation, commercial, industrial, church, and publicly-owned users) shall reduce irrigation by 75 percent for existing landscaping. D. Installation of any new landscaping is prohibited. E. Automobiles or equipment shall be washed only at commercial establishments that use recycled water. F. No commitments shall be made to provide service for new water service connections until the city has returned to a stage two drought restriction. G. Except where recycled water is used, no turf in city parks or medians shall be irrigated. H. Construction Water. Except where recycled or other non-potable	**Stage Four:** City's water supply is adequate to meet 60 percent of projected demands

water is used, use of water for dust control is prohibited. I. Swimming Pools. Filling pools and spas is prohibited. J. Water shortage surcharges and excess water use charges shall be implemented as set forth in Roseville Municipal Code Section 14.08.095.	
A. All basic stage, or stage one, stage two, stage three and stage four restrictions required shall continue in place, except to the extent they are replaced by more restrictive conditions imposed by this section. B. Residential users are to reduce water usage by 50 percent. C. Except where recycled water is used, turf or grass shall not be irrigated. No persons shall irrigate any landscaping except a tree, shrub, or drought-tolerant groundcover. No irrigation shall be done except by handheld hose equipped with a nozzle capable of completely shutting off the flow of water except when positive action or pressure to maintain the flow of water is applied. D. Water shortage surcharges and excess water use charges shall be implemented as set forth in Roseville Municipal Code Section 14.08.095.	**Stage Five:** City's water supply is adequate to meet 50 percent of projected demands

Additionally, the City completed an update to the water efficient landscape requirements to include new water conservation and management provisions. This update was prepared in compliance with the Water Conservation in Landscaping Act of 2006 (AB 1881). The old requirements were updated with the new Water Efficient Landscape requirements and were adopted by the City Council on November 4, 2009 (Ord. No. 4786).

Table 5.4 outlines the actions the City will undertake during water shortages to increase efficiency messaging and support water supply reductions during staged water conservation efforts.

Table 5.4
Water shortage contingency — consumption reduction methods

Consumption Reduction Methods	Stage When Method Takes Effect	Projected Reduction (%)
Multi-Media Public Outreach	All stages	20%
Water Waste Patrols and Customer Education	All stages	
Landscape Water Restrictions	Stage 2 - 5	Result of all actions estimate savings up to 50%
Landscape Installation Restrictions	Stage 3 - 5	
Decorative Fountain and pool reductions and restrictions	Stage 3 - 5	
Request for Residential and Commercial water use reductions	Stage 1 - 5	

Roseville anticipates that when agencies rely on volumetric based water billing that conservation cutbacks can impact revenues required for Utility operations. In an effort to stabilize revenues in times of shortage, the City has incorporated measures to deal with revenue shortfall as well as

provide additional price signals to users in the highest use brackets. During water shortages a temporary increase in water rates occurs depending on the severity and duration of the shortage. During the first year it is assumed there is a reserve fund that can be utilized to offset full increases which would occur on the second and subsequent years of a shortage conditions. Rate structures are set so that if customers meet the requested cutback (i.e. 10%, 20%, etc) they would not see an increase in their typical water bill. If they did not achieve the requested savings then water service would result in higher bills. In addition to rate stabilization the rate structure also includes penalty rates for the highest residential use customers. Depending on the shortage conditions the top two tiers will be assessed and surcharged to send an additional price signal to customers in this use category. If water use reductions were made consistent with requested need customers would not be in the highest use categories and hence not be subject to higher water bills. These water shortage consistency measures are identified in Table 5.5.

Table 5.5
Water shortage contingency — penalties and charges – RMC 14.08.095

Penalties or Charges	Stage When Measure Takes Effect	Measure Description
Water Shortage Surcharge	Stage 2 - 5	A temporary increase in per unit water rates to stabilize water revenues when customers are successful in reducing water demands.
Excess Water Use Charge	Stage 3 - 5	A temporary increase in the top tiers of water use to provide further incentives for users in these categories to find ways of reducing demands.

Copies of the City's ordinances related to water shortage contingences such as conservation requirements and excess water use surcharges are included in Attachment G.

5.4 Drought Planning

This section describes the reliability of the City's water supply and vulnerability to seasonal or climactic shortages for various water year types. The water type years are defined as follows:

- Average Year (or Normal year) - a year in the historical sequence that most closely represents median runoff levels and patterns. It is defined as the median runoff over the previous 30 years or more. This median is recalculated every ten years.
- Single-dry year - generally considered to be the lowest annual runoff for a watershed since

the water year beginning in 1903.

- Multiple-dry year period - generally considered to be the lowest average runoff for a consecutive multiple year period (three years or more) for a watershed since 1903.

To determine each year type the City reviewed data supplied by the Department of Water Resources for the American River at Folsom (AMF) Station between the years of 1901 and 2010. The unimpaired inflow, defined as the March through November flows, for each year was used to determine the base years. Table 5.6 summarizes the base years used for defining each water year and Table 5.7, provides the actual data used for the dry year types as compared against the average water year.

Table 5.6
Basis of water year data

Water Year Type	Base Year(s)
Average Water Year	1901 through 2010 (110 years)
Single-Dry Water Year	1977
Multiple-Dry Water Years	1990 through 1992 (3 years)

Table 5.7
Supply reliability — historic conditions

	Single Dry Water Year 1977 (AFY)	Multiple Dry Water Years (AFY)			
		1990	1991	1992	Average of 3 Years[1]
Folsom Reservoir Unimpaired Inflow Average Year = 1,886,210 AF Roseville Surface Water Available Average Year = 58,900 AF[2]					
Unimpaired Inflow	289,740	822,331	1,185,926	604,927	871,061
Percent of UI Average Year:	15.4%	43.6%	62.9%	32.1%	46.2%
Surface Water Allocation	39,800	54,466	58,900	46,917	56,159
Percent of Available Average Year Supply	67.6%	92.7%	100%	79.7%	95.3%

[1]Average available surface water for the 3 years is based upon the average of the unimpaired inflow value.
[2]Available surface water supplies are based upon the City's Water Forum Agreement and the allocation of supplies are based on unimpaired inflow.

5.4.1 Stages of Action

The City's Municipal Code allows the City to implement up to 5 stages for conservation as detailed in Section 5.3 and Table 5.3 above. These stages and associated actions are planned for use not only

for water shortages caused by emergencies but also to address water supply reductions as a result of drought. Each water conservation stage is estimated to yield a ten percent reduction in surface water supply needs. The following table, Table 5.8, outlines the water supply conditions that would trigger each conservation stage. The City plans on mitigating surface water shortages with use of groundwater, conservation and expansion of recycled water, as available. Per the Roseville Municipal Code 14.090.050, however, groundwater cannot be used until surface water shortages would result in greater than 20% shortage which would trigger Stage 3 drought conditions. Groundwater cannot be used to decrease drought conditions to lower than Stage 2 conditions.

Table 5.8
Water shortage contingency — rationing stages to address water supply shortages

Stage No.	Water Supply Conditions	% Shortage
Basic Stage	Full surface water supply allocation of 58,900 AF[1]	0%
Stage 1	Surface water supply availability of 53,000 AF	10%
Stage 2	Surface water supply availability of 47,120 AF	20%
Stage 3	Total water supply availability of 41,230 AF	30%
Stage 4	Total water supply availability of 35,340 AF[2]	40%
Stage 5	Total water supply availability of 29,450 AF[2]	50%

[1] Surface water availability consistent with Water Forum Agreement for water taken from the American River system.
[2] Based on water supply portfolio available it is not projected or anticipated that shortages would ever get to levels of 40 – 50% shortage. Measures are planned, however, to meet regulatory requirements or UWMP.

Pursuant to the City's Water Forum Agreement, the City has assumed it is limited to no less then 39,800 AFY of surface water supplies in the driest of year types although conference years, when unimpaired inflow to Folsom is below 400,000 AFA, may result in further reductions. This represents a 32.4% reduction in average year water supplies of 58,900 AFY. The City has planned groundwater resources to meet the needs of the community so that supply conditions are not anticipated to require conservation reductions greater than 20%. In the event conference years require additional reductions in water supplies then increased conservation measures and additional groundwater use would be considered to make up for the shortage.

Table 5.9 provides an estimate of water resources available for each of the next 3 water years based on the driest 3 year historic sequence for the City's water supply, as described in Tables 5.6 and 5.7 above. For the three year series, it is assumed the USBR Central Valley Project (CVP) contract water will be reduced 25% in the first year; CVP water will be fully available in the second year and will be reduced 50% in the third year. PCWA water is however assumed to be available in all three years. Because the City's contract with SJWD is for normal year supplies, the supply is assumed not

available during the three year series. Recycled water is available in all year types to offset portions of the City's irrigation water demand. For normal years, recycled water supplies are estimated to equal the amount of demand used in 2010 and for the three consecutive years is estimated to increase slightly each year as new irrigation demands are added as a result of new recycled water service connections but this increase in supply is not reflected in Table 5.9 as a more conservative approach was used. Groundwater is not shown within Table 5.9 as it is only used by the City as a backup supply to supplement water supplies if necessary to meet demands. For this planning phase and current system demands it is not anticipated that drought shortages will exist. Roseville has, in the past, declared drought conditions and called for reduction measures as a result of statewide conditions and to provide consistency in messaging in the region.

Table 5.9
Supply reliability — current water sources (AFY)

Water supply sources[1]	Average / Normal Water Year Supply[2]	Multiple Dry Water Year Supply[2]		
		Year 2011	Year 2012	Year 2013
Bureau of Reclamation	32,000	24,000	32,000	16,000
Placer County Water Agency (PCWA)[5]	30,000	30,000	30,000	30,000
San Juan Water District (SJWD)	4,000	0	0	0
Recycled Water[3]	1,709	1,709	1,709	1,709
Total	**67,709[4]**	**55,709**	**63,709**	**47,709**
Percent of normal year:	100%	82.3%	94.1%	70.5%

[1]From Table 4.1.
[2]See Table 5.6 for basis of water type years.
[3]As a conservative estimate current recycled water use estimated for all years.
[4]Total contract water available in normal water years. Does not account for Water Forum commitment of 54,800. See section 4.1.1 for total surface water supply sources.
[5]Although PCWA contract water not scheduled and paid for until needed full contract amounts are available on a temporary basis in the event of shortages in other supplies.

5.4.2 Saving Verification

Determination of water savings is always a challenge due to the variables involved. In shortage conditions it follows that "normal" water use would tend to increase due to climatic conditions while measures are implemented to result in an overall reduction in water use. As a result, the method for tracking of success will be based on continuous monitoring of information available. Measures anticipated include:

- Monthly review of total water production into the system
- Per customer water use comparison to same period of previous year or unconstrained condition. This may be a challenge based on changed ownership but can be used to determine outliers and non-compliance that would warrant individual follow-up.
- Monitoring of individual landscape budgets established for dedicated irrigation accounts. Although these are not currently used for billing purposes they can be used for comparative analysis.

In all metrics it will be necessary to determine methods for normalizing to then current conditions which will be an ongoing effort for reporting. This will be an ongoing process required during times of shortage.

5.5 Reliability Assessment

The following section summarizes the reliability of City water supplies during normal, dry and multiple dry water years.

Normal Year Assessment

Normal year supplies versus water demand targets over the next 20 years are compared in Table 5.10 below. Normal wet year supplies are comprised of surface water supplies from USBR, PCWA and SJWD as well as recycled water used for some irrigation demands within the City. As shown in Table 5.10, the City's normal year water supplies exceed target water demands over the next 20 years.

Table 5.10
Supply and demand comparison — normal year (AFY)

	2015	2020	2025	2030	2035 - opt
Supply totals (Table 4.1)	53,197	58,670	68,980	69,397	69,770
Target demand totals (Table 3.11a)	39,423	41,101	48,611	50,464	51,610
Difference	13,774	17,869	20,369	18,933	18,160
Difference as % of Supply	25.9%	30.5%	29.5%	27.3%	26.0%
Difference as % of Demand	34.9%	43.5%	41.9%	37.5%	35.2%

Single Dry and Multiple Dry Year Assessments

In dry years the City of Roseville's water supplies are reduced as compared to normal water years surface water supply limitations and cut-backs set forth in water supply contracts. During dry and multiple dry year conditions, the City plans to reduce water demands through staged conservation efforts allowed under the City's Municipal Code to meet the City's Water Forum Agreement commitments which require reduced diversions from the American River during dry and critically dry years. A 20% demand reduction achieved through implementation of up to a Stage 2 level of conservation is assumed to conservatively plan for water supplies during a single dry year event. Based on historical data, multiple dry years results in more water availability and surface water supplies are not as limited as during a single dry year. In these conditions the City will initiate a voluntary conservation request to its water customers reduce 10% in their usage. This is consistent with regional approaches that are being coordinated to educate customers and prepare for potential future shortages.

Single dry year supplies versus water demand targets over the next 20 years are compared in Table 5.11 below. In a single-dry year, it is anticipated the City's surface water supplies would be reduced to their lowest available level of 39,800 AFY per the City's Water Forum Agreement. Water demands will be met through available surface water supplies, recycled water supplies and groundwater if needed to supplement supplies. As previously noted, recycled water supplies are still available at the same level as available during normal years. It is important to note that the water demands shown are target water demands. Should implementation of demand reduction measures not reduce total water demands to the target levels, demands are expected to be greater (reference Table 3.11b for estimates based on current water demands). Should demand targets not be met, groundwater would be utilized to supplement surface water and recycled water supplies. As shown in Table 5.11, if target demands can be met, supplemental groundwater supplies are not required.

Table 5.11 Supply and demand comparison — single dry year (AFY)					
	2015	**2020**	**2025**	**2030**	**2035 - opt**
Supply:					
Surface Water	39,800	39,800	39,800	39,800	39,800
Recycled Water	2,197	2,670	2,980	3,397	3,770
Groundwater	0	0	0	0	0
Supply total	**41,997**	**42,470**	**42,780**	**43,197**	**43,570**
Demand:					
Target Demand	39,423	41,101	48,611	50,464	51,610
Drought Stage Demand Reduction (20%)[1]	(7,445)	(7,686)	(9,126)	(9,413)	(9,568)
Target demand total	**31,978**	**33,415**	**39,485**	**41,051**	**42,042**
Difference	10,019	9,055	3,295	2,146	1,528
Difference as % of Supply	23.9%	21.3 %	7.7 %	5.0 %	3.5 %
Difference as % of Demand	31.3 %	27.1 %	8.3%	5.2%	3.6 %

[1]Demand reduction is 20% of surface water needs because recycled water is available in all year types and is not subject to conservation efforts so recycled water supply is first subtracted from the target demand. For example for 2015: (40,337 – 2,197) X 20% = 7,628.

Multiple dry year supplies versus water demand targets over the next 20 years are compared in Table 5.12 below. In each of the multiple dry year scenarios, it is anticipated the City's surface water supplies would be reduced to the same level as outlined in Table 5.9 above. As is the City's practice, water demands will be met through available surface water supplies, recycled water supplies and groundwater if needed to supplement supplies. As previously noted, recycled water supplies are available at the same level as during normal years. It is important to note that the water demands shown are target water demands. Should implementation of demand reduction measures not reduce total water demands to the target levels, demands are expected to be greater (reference Table 3.11b for estimates based on current water demands). Should demand targets not be met, groundwater would be utilized to supplement surface water and recycled water supplies. As shown in Table 5.12, if target demands can be met, supplemental groundwater supplies are not required.

Table 5.12 Supply and demand comparison — multiple dry-year events (AFY)						
		2015	**2020**	**2025**	**2030**	**2035 - opt**
Multiple-dry year first year supply	**Supply:**					
	Surface Water	54,000	54,000	54,000	54,000	54,000
	Recycled Water	2,197	2,670	2,980	3,397	3,770
	Groundwater	0	0	0	0	0
	Supply total	**56,197**	**56,670**	**56,980**	**57,397**	**57,770**
	Demand:					
	Target Demand	39,423	40,111	47,510	49,334	50,453
	Drought Stage Demand Reduction (10%)[1]	(3,723)	(3,744)	(4,453)	(4,594)	(4,668)
	Target demand total:	**35,700**	**36,367**	**43,057**	**44,740**	**45,785**
	Difference	20,497	20,303	13,923	12,657	11,985
	Difference as % of Supply	36.5%	35.8%	24.4%	22.1%	20.7%
	Difference as % of Demand	57.4%	55.8%	32.3%	28.3%	26.2%
Multiple-dry year second year supply		**2015**	**2020**	**2025**	**2030**	**2035 - opt**
	Supply:					
	Surface Water	62,000	62,000	62,000	62,000	62,000
	Recycled Water	2,197	2,670	2,980	3,397	3,770
	Groundwater	0	0	0	0	0
	Supply total	**64,197**	**64,670**	**64,980**	**65,397**	**65,770**
	Demand:					
	Target Demand	39,423	40,111	47,510	49,334	50,453
	Drought Stage Demand Reduction (10%)[1]	(3,723)	(3,744)	(4,453)	(4,594)	(4,668)
	Target demand total:	**35,700**	**36,367**	**43,057**	**44,740**	**45,785**
	Difference	28,497	28,303	21,923	20,657	19,985
	Difference as % of Supply	44.4%	43.8%	33.7%	31.6%	30.4%
	Difference as % of Demand	79.8%	77.8%	50.9%	46.2%	43.6%
Multiple-dry year third year supply		**2015**	**2020**	**2025**	**2030**	**2035 - opt**
	Supply:					
	Surface Water	46,000	46,000	46,000	46,000	46,000
	Recycled Water	2,197	2,670	2,980	3,397	3,770
	Groundwater	0	0	0	0	0
	Supply total	**48,197**	**48,670**	**48,980**	**49,397**	**49,770**
	Demand:					
	Target Demand	39,423	40,111	47,510	49,334	50,453
	Drought Stage Demand Reduction (10%)[1]	(3,723)	(3,744)	(4,453)	(4,594)	(4,668)

	Target demand total:	**35,700**	**36,367**	**43,057**	**44,740**	**45,785**
	Difference	12,497	12,303	5,923	4,657	3,985
	Difference as % of Supply	25.9%	25.3%	12.1%	9.2%	8.0%
	Difference as % of Demand	35.0%	33.8%	13.8%	10.4%	8.7%

[1]Demand reduction is 10% of surface water needs because recycled water is available in all year types and is not subject to conservation efforts so recycled water supply is first subtracted from the target demand. For example for 2015, first year supply: (39,423 – 2,197) X 10% = 3,723.

SECTION 6
Demand Management Measures

The unpredictable water supply and ever increasing demand on California's complex water resources have resulted in a coordinated effort by the DWR, water utilities, environmental organizations, and other interested groups to develop a list of best management practices for conserving water. This consensus-building effort resulted in a Memorandum of Understanding Regarding Urban Water Conservation in California (MOU), which formalizes an agreement to implement these practices and makes a cooperative effort to reduce the consumption of California's water resources.

6.1. Water Reduction Requirements

The City of Roseville is a signatory to the California Urban Water Conservation Council (CUWCC) MOU and a United States Bureau and Reclamation (USBR) contractor that is required to develop and maintain a water conservation plan consistent with the requirements of the Central Valley Project of 1992. In addition, Roseville is a member and signatory to the Water Forum which also includes requirements for water conservation programs. The USBR and the Water Forum use the CUWCC MOU method of compliance to satisfy the requirements of their agreements. The City has chosen to utilize the Gallons Per Capita Per Day (GPCD) compliance option offered by the CUWCC, thus committing to reduce its GPCD water use by 18% by the year 2018 from the established baseline (shown in Table 6-1). The City chose this compliance option to be consistent with the efforts and reporting structure of the SBx7 7 requirement of a 20% reduction by the year 2020.

Table 6-1 represents the City's CUWCC compliance baseline representing a 10 year average for years 1997 through 2006, as specified by the CUWCC MOU.

Table 6-1 CUWCC 10-year average baseline calculation

Year	Population	AF	Gallons	GPCD	10 yr average GPCD
1997	62,315.68	23,000	7,494,582,857	329.5	
1998	65,765.74	20,462	6,667,571,931	277.8	
1999	69,518.74	24,177	7,878,109,989	310.5	
2000	77,627.38	25,646	8,356,785,737	294.9	
2001	79,564.78	27,427	8,937,127,131	307.7	
2002	82,586.60	29,718	9,683,652,754	321.2	
2003	87,442.08	29,743	9,691,799,040	303.7	
2004	92,856.04	32,325	10,533,133,575	310.8	

2005	99,164.18	31,480	10,257,789,480	298.5	
2006	100,545.28	33,636	10,960,324,236	298.7	305.3

Table 6-2 presents the City's compliance table to satisfy the implementation schedule of the CUWCC GPCD compliance option to reduce water use by 18% by the year 2018.

Table 6-2 CUWCC GPCD Compliance table

Year	Compliance Report	Target GPCD (% of baseline)	Highest acceptable GPCD bound (% baseline)
2010	1	294.3	305.3
2012	2	283.3	294.3
2014	3	272.3	283.3
2016	4	261.4	272.3
2018	5	250.4	250.4

6.2 Compliance Strategy

The Department of Water Resources has given CUWCC signatories the option to attach their 2009/2010 CUWCC compliance reports as a method of compliance with Section 6 of the Urban Water Management Plan. The City has chosen to attach its 2009/2010 CUWCC compliance reports as its method of compliance. The compliance reports are included as Appendix I. These compliance reports confirm the City is on track to satisfy its CUWCC GPCD conservation savings requirements and have active programs to ensure its compliance.

To achieve and sustain the City's GPCD savings requirements, as specified by SBx7 7 (known as the 20%x2020 bill), Roseville must have comprehensive programs in place. Described is Roseville's current strategy to achieve reduction compliance.

Water Wise House Calls (single-family residential and multi-family residential connections)

Description: This water conservation measure involves inspecting the interior and exterior of single-family and multi-family residential water customers' homes by trained surveyors. Surveys identify water-savings potential and provide incentives to reduce water demand.

Single-family surveys are about two hours in length and are conducted by a one to two-member

team. During the interior portion of the survey the team measures flow rates of existing plumbing fixtures and tests for toilet leakage with dye tablets, checks all water using appliances and fixtures for leaks, offers high-efficiency showerheads and faucet aerators (if necessary), and provides information on the City's rebate programs.

The team then conducts a landscape survey. This involves testing the sprinkler system for irrigation efficiency and distribution uniformity, teaching the customer how to set the irrigation controller, suggesting a four-season irrigation schedule (based on the individual landscape demographics and irrigation system), recommending sprinkler system repairs or improvements, reviewing water bill information, and providing rebate information and brochures on water efficiency methods and ideas. Multi-family surveys are similar, but require coordination with owners/managers, tenants, and landscaping services. Soil moisture probes are also provided to help schedule irrigation times based on soil moisture content. This has proven to be a valuable incentive to reduce water run off.

The City receives calls from customers who have seen the House Call program advertised but the City schedules most of its House Calls through solicitation. Staff sets aggressive water use limits in the billing system and then receives abnormal water use and high water use work orders from the Finance Department. Staff also uses door hangers to promote the House Call program.

Methods to Evaluate Effectiveness: The City uses the CUWCC estimated water savings projections to track the programs level of effectiveness. City staff can also review the surveyed customers' water use records, if available, and compare historic with current use for one year after the survey.

Residential plumbing retrofit

Implementation Description: The City distributes showerheads, aerators, water shutoff nozzles, toilet flappers, moisture meters, toilet tank leak detection tablets, and toilet displacement devices at local events as well as during in-home water audits. At these events the City also emphasizes availability of all programs, including water use surveys, washing machine rebates, and toilet replacement rebates. Through these methods the City will offer retrofit materials to no less than 10 percent of the 15,010 pre-1992 single-family homes each year for 10 years or until 75 percent have been reached with these materials. The City will reach this target through programs,

events, and aggressive public outreach newsletters and mailings, including offers to all customers receiving meter retrofits.

Methods to Evaluate Effectiveness: The City monitors distribution of materials to customers and perform surveys as to customer satisfaction with the materials provided.

System water audits, leak detection and repair

Implementation Description: The City has had a long-standing system leak detection and repair program in place. However, in 2009 the City used the AWWA Water Loss software to develop a water loss assessment of the current system. The first audit using this software was conducted in 2009 and will be used annually. In addition, an annually updated "system map" indicating pipe size, pipe material, connection points and leak history is maintained within the City's maintenance database. When areas of high leak incidences are identified, corrective action is taken. System leaks are repaired as they are identified. This includes corrosion monitoring programs, service cathodic protection and/or replacement. This may also include doing a detailed leak detection survey to identify leaks in the system. The infrastructure management system is updated with repair information. This enables the City to query for leak prone areas in order to prioritize future rehabilitation programs.

Methods to Evaluate Effectiveness: The City focuses on the older areas of town that are more leak prone. The City will continue to monitor the system for areas that have high incidences of leaks. This evaluation will improve as more customers are converted to metered usage. When a leak is discovered and repaired, it is logged in the City's asset management system. The amount of water loss from each leak found are estimated based on the assessment of the operation crews that responded to the leak.

Metering with commodity rates for all new connections and retrofit of existing connections

Implementation Description: A meter retrofit program has been developed and is currently being implemented. The retrofit program addresses metering of all pre-1992 residential services in Roseville as well as a transition of all residential accounts to an inclining block rate structure. Implementation of metered rates began immediately on all residential metered connections established after January 1, 2002, with the remaining retrofitted homes transitioned in large blocks as retrofits are completed. During program development, it was requested that

customers be provided water use information for a period of one year before transitioning to a metered rate. This has been incorporated into the plan, and the first block of homes to be transitioned began receiving comparative data in March 2003 with transition to metered rates in April 2004. Other blocks of homes will have metered rates implemented after completion of meter installation and following a year of comparative bill information.

The meter retrofit program will be complete in December 2011 and all residential customers will be billed on a metered rate by December 2012. Having a fully metered service territory will help staff better understand usage patterns making for better program management.

Methods to Evaluate Effectiveness: Effectiveness of this program will be evaluated by comparison of prior water use to future water use once the system is completely metered.

Landscape conservation programs and incentives

Implementation Description: The City has developed water budgets for 93% of its dedicated irrigation accounts, large and small. These budgets were created using the City's graphical information system (GIS) and then field sampled for accuracy. The budget reports, produced monthly, show the customer what their water use was for the month as compared to what the water budget calculation estimated the water use to be based on their sites demographics. Staff requests meetings with landscape contractors and/or property managers/owners when a water budget is 20% or more out of budget. City locations, including parks, streetscapes and lighting and landscape districts fall under this program and are contacted if out of budget. City staff is working to create a budget based rate structure to further incentivize adherence to the established water budget.

In 2008, Roseville created a turf replacement program titled "Cash for Grass" that provides incentive for customers to replace their turf with water efficient landscaping. Turf is purchased at $1 per square foot up to $1,000 per residential site. To comply, participants must not only remove their turf but install a low volume irrigation system to irrigate their new water efficient landscape.

In 2008, Roseville created a pool cover rebate program that provides incentive to pool owners to cover their swimming pool. The intent of the program is to minimize evaporation and save water during the summer months.

In 2010, Roseville created programs that provide incentive for upgrading an inefficient irrigation system with new high efficiency equipment. The program includes the installation of weather based irrigation controllers, conversion of high use pop up spray heads to low volume spray heads, conversion of high use pop up spray heads to a low volume drip irrigation system, replacing a leaking irrigation valve, installation of check valves to eliminate low head drainage, and installation of pressure regulating valves.

In 2010, Roseville adopted a water efficient landscape ordinance pursuant to the requirements of AB 1881. These requirements apply to all landscapes installed after January 1, 2010 for industrial, commercial, office, institutional, multi-family residential common areas, model homes and developer installed landscaping for single-family residences. Roseville will continue to enforce these landscape requirements through submittals to the Planning Department. Developer landscape architect self-certification, along with periodic spot checks of plans, ensures compliance with landscape requirements. The water utility will be running water budget reports monthly on the affected landscapes confirming compliance.

Roseville provides free landscape audit services for any customer in need. Staff evaluates the irrigation system and makes recommendations for improvement. Rebates are available to further incentivize the customer to make improvements to their irrigation systems.

For most commercial metered accounts, large irrigation accounts and large lot residential accounts, financial savings due to water conservation are realized directly on monthly water bills. Roseville staff can help identify these savings through water use reviews, incentives and resulting education opportunities. In most instances, helping customers understand the savings that can be achieved and methods available to achieve these savings can be enough to motivate changes. The City continually works with the Parks Department, area school districts, and landscape contractors and property managers to improve water use efficiency.

Methods to Evaluate Effectiveness: The City will continue to implement this program by annual review of customers' water use and by offering on-site follow-up evaluations to customers whose

total water use is thought to exceed normal patterns.

Review of the landscape requirements is initiated as required, and spot checking for compliance by the Planning Department determines compliance supplemented by the monthly review of water budget compliance. Continued reduction in the per capita water consumption for the City also indicates the effectiveness in these requirements.

High-efficiency washing machine rebate programs

Description: In addition to providing water service to customers within the Roseville service area, the City is also responsible for providing electric service within the service area and wastewater collection and treatment on a much larger, regional area. A cooperative program is in place that provides for rebates toward the purchase of a high-efficiency washing machine. Through 2009, the City's electric department contributed financially to this program. As of 2010, funding from the electric department is no longer available. Funding from the wastewater utility is still available and being utilized. This program is run much the same way as the current toilet replacement program, utilizing a set budget based on contributions from the participating utilities and provided to applicants on a first come, first serve basis.

Methods to Evaluate Effectiveness: The City will monitor program success through the number of rebates requested. Expansion of the program is considered annually based on the previous years' participation levels, available grant funding, or any budget constraints.

Public information programs

Description: The City promotes water conservation and other resource efficiencies in coordination with the US EPA, the Regional Water Authority (RWA), Roseville Electric, and Roseville's Public Information Department. The City distributes information through paid advertisements, television commercials, featured segments on the local government access channel, website (includes streaming video), the City's Utility Exploration Center, several water efficient workshops each year, movie theater ads, newsletters, bill inserts, bill messages, brochures, vehicle decals, community outreach events, community speaker bureaus, and many special events every year.

In 2005, water bills have been redesigned to show historical water usage on individual accounts.

This information allows businesses and homeowners to monitor water usage as it varies through the year and can be used to reinforce the conservation message.

Roseville's regional waste water treatment plant located at 1800 Booth Road, installed a recycled water garden to demonstrate the benefits of using recycled water as an alternative. This facility is open for tours and can be scheduled through plant staff.

In 2008, the City created the Roseville Utility Exploration Center housed within the Martha Riley Library building, which was recently awarded Gold LEED (Leadership in Energy and Environmental Design) Certification by the U.S. Green Building Council. It is the first building in Placer County to be so honored. Designed for active community use, the center provides a lively combination of hands-on exhibits with a Learning Lab for demonstrations, presentations and workshops. Future plans include an outdoor extension called the Ideascape, which will feature exhibits on water-wise landscaping, irrigation and construction innovations, solar energy, watershed protection and more. Created out of the city's belief that sustainability is a principle to live by, the Exploration Center is a one-of-a-kind environmental learning center focused on bringing visitors information on protecting natural resources in a fun, engaging way. Topics covered include energy efficiency, renewable technology, water conservation and recycling.

The City also is a member of the Regional Water Authority (RWA). RWA has an active public outreach campaign in which the City contributes to. The program consists of paid advertising campaigns to market the Blue Thumb program, public service announcements, partnerships with big box stores to co-market our conservation message, as well as with the local baseball team the RiverCats. RWA hosts an interactive website that contains blogs on water use efficiency, garden tours and program information.

Methods to Evaluate Effectiveness: The City will monitor the effectiveness of the conservation message through planned customer surveys.

School education programs

Description: The City continues to work with the Regional Water Authority (RWA) and the school districts to promote water conservation and other resource efficiencies at school facilities and to educate students about these issues. This is accomplished through full participation in

the school education program coordinated by RWA on behalf of all the member agencies. In addition to being a participating member in RWA, Roseville also contributes to the education programs that are focused directly on in-school education. School outreach, media advertising campaigns, promotional materials, community events and fairs, and a Web site are all a part of this program.

In addition to RWA participation, Roseville supports requests from local schools for presentations, conservation related materials, and facility tours. These are offered to any school within the service area and supported as requested. The City's program also includes presentations to after school and summer programs, such as Adventure Club. The City also works with 6th grade classrooms throughout Roseville to implement the Living Wise program, which is a water and energy efficiency lesson plan that students incorporate into their home life. Through the City's Utility Exploration Center, grade specific water efficiency workshops and activities are given to participating students and the City contributes to the Placer Nature Center which offers tours and educational programs to local students about water use efficiency.

Methods to Evaluate Effectiveness: The City receives a report from RWA on the number of programs, materials distributed and attendance at water conservation activities by grade level. This same information is collected and evaluated for City supported activities as well as activities at the Placer Nature Center.

Conservation programs for commercial, industrial, and institutional accounts

Description: For the last several years, the City has provided water use surveys to commercial/ industrial/institutional (CII) customers upon request. The City also conducts an analysis of all CII customers by monthly and annual water usage to identify the top 10 percent of the commercial customers. The City contacts these customers, by phone, letter or site visit to offer surveys. In addition, the City offers incentives to CII customers to improve their water use efficiency. Programs are evaluated annually but in 2010 the City offered high efficiency toilet rebates, high efficiency washing machine rebates, a pre-rinse spray valve exchange program, and a customized incentive program that can be tailored to a site's needs.

For new commercial and industrial development, the City Planning Department coordinates the implementation of this program at the request of the Environmental Utilities Department. Water

usage and required conservation measures are currently reviewed during the project approval process. This is due to the complexity of many commercial/industrial operations that require savings to be identified by design professionals associated with the project. When projects come in that can potentially require high levels of usage, a requirement is placed on the applicant to review the process for water saving opportunities. Suggested methods may be included in the project conditions if sufficient information is available. This can include items such as requiring recycle capability in car wash facilities, or other conservation measures. In addition, it is expected that the Building Department review the applicable conservation requirements of the Uniform Plumbing Code (UPC) and require compliance.

Methods to Evaluate Effectiveness: The City will continue to implement this program by annual review of customers' water use data, and by offering on-site follow-up evaluations to customers whose total water use increases or stays the same after an initial survey. All new commercial and industrial water applicants will be reviewed for potential savings. In addition, staff will be tracking CII water use in GPCD and working towards a downward trend.

Conservation pricing

Description: As a component of development of the meter retrofit program Roseville adopted conservation pricing for water on all metered accounts. This includes an inclining block rate structure for residential water accounts based on the measured water through the meter on top of a service charge for operational fixed costs. Current residential rates (August 2011) are based on water use units of 100 cubic feet and are:

- $0.39 per unit for the first 1,200 cubic feet
- $0.78 per unit for the next 3,000 cubic feet
- $1.17 per unit for the next 3,300 cubic feet
- $1.74 per unit for water over 7,500 cubic feet

In addition to the tiered rate structure, effective on billings as of May 1, 2009, all quantity rates identified in Section 14.08.090 will be subject to the water shortage surcharges and excess water use charges when the drought stages identified and set forth in Sections 14.09.070 through 14.09.110 are declared. These charges further incentivize the need to conserve in times of water supply limitations.

These water shortage rate structures are provided in Table 6-3.

Table 6-3 Summary of Water Shortage Rate Charges
Conservation Pricing

Summary of Water Shortage Rate Charges			
Stage	**Water Use Restriction**	**Water Shortage Surcharge[1]**	**Excess Water Use Charge[2]**
First Year of a Water Shortage			
Stage 1	10%	None	None
Stage 2	20%	15%	None
Stage 3	30%	33%	25%
Stage 4	40%	45%	50%
Stage 5	50%	60%	100%
Subsequent Year(s) of a Water Shortage			
Stage 1	10%	15%	None
Stage 2	20%	20%	25%
Stage 3	30%	40%	50%
Stage 4	40%	50%	100%
Stage 5	50%	75%	200%

[1]The water shortage surcharge shall be added to all quantity rates as applicable, according to drought stage.
[2]In addition to the applicable water shortage surcharge, an excess water use charge shall be added to Tier 3 and Tier 4 water quantity rates, according to drought stage.

For non-residential accounts, water usage is billed on top of a monthly service charge for fixed operational costs. Current uniform non-residential rates are based on 100 cubic foot units as follows:

- $0.78 per unit for all water on non-residential accounts

Methods to Evaluate Effectiveness: The City monitors the annual revenue and water usage for its customers and adjusts revenue requirements as necessary to cover operational costs as water use reductions occur resulting from the new rates. As the metering program is fully implemented, the City will be able to better collect and analyze data to track the effectiveness of this program.

Conservation coordinator

Description: The City has a full time water conservation administrator, water conservation specialist, three full time field personnel, one full time administrative clerk, one part time temporary administrative clerk, and two part-time temporary water waste patrol officers. The Conservation Division also pulls assistance from the utility service staff to perform water leak detection and leak repair.

Methods to Evaluate Effectiveness: The City has no method to quantify the savings but believes that this program is in the public's interest.

Water waste prohibition

Description: Roseville currently restricts water waste within the service area. Roseville Municipal Code Chapter 14.09 (presented in Appendix J) defines water waste and associated penalties of continued infractions. Per Water Division policy, water wasters are provided a notice at the location (3 notices in non-shortage conditions, 2 notices in water shortage conditions, and 1 notice with an immediate remedy in urgent water shortage conditions). If the situation is not remedied by the specified time additional measures can be taken to gain compliance. This includes fines, water restrictions, transition to a metered water rate (if applicable), low flow devices or discontinued service.

The City employs two 1,500 hour temporary workers to constantly patrol the Roseville city limits looking for water waste. In addition, full time City staff patrol for waste between appointments. They look for any violation of the City's ordinance and then makes attempt to contact the customer to educate them on the ordinance, give them information about the City's programs and services and leaves a door hanger notice with notification of the problem. The patrols significantly increase the number of Water Wise House Calls the conservation division performs as staff promotes the service at the time the notice is given. The driver of the program is customer contact and education. It is the City's intent to speak with customers before leaving a notice.

The City has an anonymous on-line reporting mechanism that allows customers to report water waste at their convenience. Customers can visit www.roseville.ca.us/waterwaste and submit an electronic form. All reports are investigated upon receipt.

Methods to Evaluate Effectiveness: All citations and violations are tracked annually. Over the period of implementation the City has increased patrols and marketing budgets to increase awareness of the program. The increasing population within the City requires continuous education efforts.

Residential toilet replacement programs

Description: The City established a ULFT (ultra low flush toilet) replacement program in 1999 and an HET (high efficiency toilet) rebate program in 2008. Because of changes to the CUWCC MOU only offering compliance credit for the replacement of high flush toilets with HETs, the City began phasing out its ULFT rebate program. In 2010, the City stopped rebating ULFTs for CII customers and in 2011, the City stopped rebating ULFT's for residential customers and now only offers rebates for HETs. Rebates are offered on a first come/first service basis to customers on an annual basis.

The toilet rebate program is advertised regularly on Roseville's Channel 11, within bill inserts, conservation articles, newsletters, and the City Conservation Web site which includes a rebate application that can be downloaded. Customers can also obtain an application by request through the mail or at special events and City office public counters.

Methods to Evaluate Effectiveness: The City will continue to maintain the replacement program and monitor its success through rebate requests. Expansion of the program will be considered annually based on the previous years' participation.