

## **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.

<b>Table 4.1</b>							
<b>Water supplies — current and projected – acre-feet/year</b>							
<b>Water Supply Sources</b>		<b>2010</b>	<b>2015</b>	<b>2020</b>	<b>2025</b>	<b>2030</b>	<b>2035 - opt</b>
<b>Supplier- purchased surface water<sup>1</sup></b>	<b>Wholesaler supplied volume?</b>						
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
<b>Other water supplies:</b>							
Supplier-produced groundwater <sup>2</sup>		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
<b>Total</b>		<b>47,709</b>	<b>53,197</b>	<b>58,670</b>	<b>68,980</b>	<b>69,397</b>	<b>69,770</b>

<sup>1</sup>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

<sup>2</sup>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.

<b>Table 4.2 Wholesale supplies — existing and planned sources of water – acre-ft/year</b>						
<b>Wholesale sources</b>	<b>Contracted Volume</b>	<b>2015</b>	<b>2020</b>	<b>2025</b>	<b>2030</b>	<b>2035 - opt</b>
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
<b>Total</b>	<b>66,000</b>	<b>46,000</b>	<b>51,000</b>	<b>56,000</b>	<b>66,000</b>	<b>66,000</b>

### 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 second (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 than 58,900 AFY during normal wet years and to take no more than 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.

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

<sup>1</sup>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**

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

#### 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 within 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.

<b>Table 4.5</b>			
<b>Transfer and exchange opportunities (AFY)</b>			
<b>Transfer agency</b>	<b>Transfer or exchange</b>	<b>Short term or long term</b>	<b>Proposed Volume</b>
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
<b>Total</b>		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**

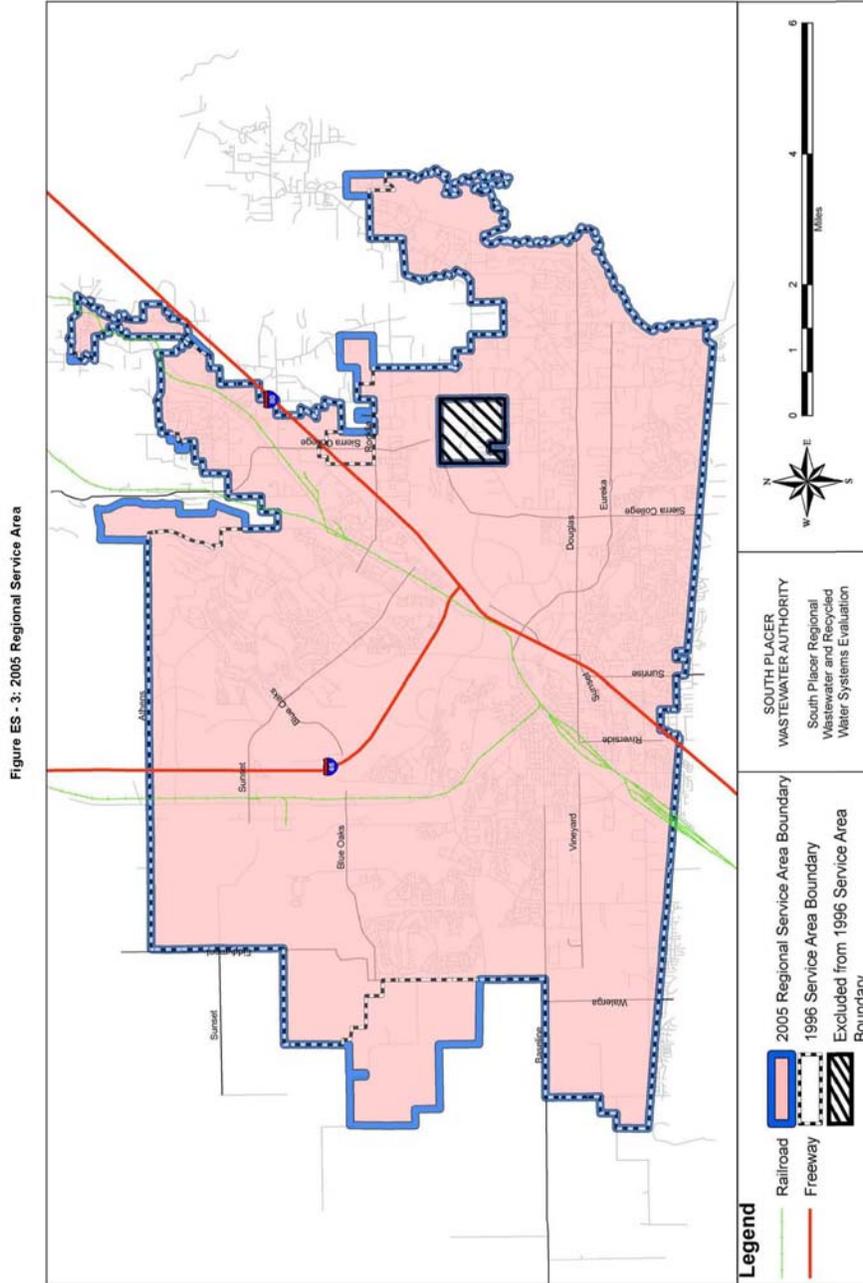
The City of Roseville currently operates two regional wastewater treatment facilities that treat wastewater flow collected from the City of Roseville, South Placer Municipal Utilities District, and some areas of Placer County. This section provides information on the wastewater and its current and potential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



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 nitrification 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.

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

<b>Table 4.6b</b>							
<b>Recycled water — wastewater collection and treatment</b>							
<b>Local City of Roseville wastewater flows (AFY)</b>							
<b>Type of Wastewater</b>	<b>2005</b>	<b>2010</b>	<b>2015</b>	<b>2020</b>	<b>2025</b>	<b>2030</b>	<b>2035 - opt</b>
<b>Wastewater collected &amp; treated in service area – DCWWTP</b>	6,846	6,314	5,857	6,281	6,910	6,934	6,934
<b>Wastewater collected &amp; treated in service area - PGWWTP</b>	4,105	4,642	6,668	8,036	9,464	10,432	11,146
<b>Volume that meets recycled water standard</b>	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.

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

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)**

<b>User type</b>	<b>Description</b>	<b>Feasibility</b>	<b>2015</b>	<b>2020</b>	<b>2025</b>	<b>2030</b>	<b>2035</b>
<b>Agricultural irrigation</b>	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
<b>Landscape irrigation</b>	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
<b>Commercial re-use</b>	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
<b>Wildlife habitat /Wetlands</b>	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
<b>Industrial reuse</b>	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
<b>Groundwater recharge</b>	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
<b>Seawater barrier</b>	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
<b>Geothermal/Energy</b>	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
<b>Indirect potable reuse</b>	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
<b>Total</b>			<b>7,797</b>	<b>8,270</b>	<b>8,580</b>	<b>8,997</b>	<b>9,370</b>

#### 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.

<b>Table 4.9</b>		
<b>Recycled water — 2005 UWMP use projection compared to 2010 actual (AFY)</b>		
<b>Use type</b>	<b>2010 actual use</b>	<b>2005 Projection for 2010</b>
Agricultural irrigation	0	0
Landscape irrigation <sup>1</sup>	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
<b>Total</b>	<b>1,709</b>	<b>4,399</b>

<sup>1</sup>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.

<b>Table 4.10</b>		
<b>Future water storage projects</b>		
<b>Project Name</b>	<b>Tank Volume (MG)</b>	<b>Projected Completion Date</b>
West Side Tank	6	2015
Sierra Vista Tank	5	2022
North Industrial Tank	6	2018
<b>Total</b>	<b>17</b>	

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.

<b>Table 4.11</b>		
<b>Future groundwater well projects</b>		
<b>Project Name</b>	<b>Production (gpm)</b>	<b>Projected Completion Date</b>
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
<b>Total</b>	<b>14,400</b>	

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
<b>Total</b>				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.