

3. Water Conservation Program

The City of Tumwater's conservation program consists of both independent and regional cooperative efforts. Tumwater partners with the LOTT Alliance, the regional wastewater utility, on some of the conservation measures included in the program. The remainder of the measures are developed and implemented by City of Tumwater staff.

Tumwater funds the local portion of the conservation program through water utility rates. The regional conservation efforts, of which Tumwater is an active participant, are funded from wastewater utility fees.

There are three major components of this chapter. The chapter begins with a summary of Washington State water use efficiency regulations and conservation planning requirements, and the status of Tumwater's compliance with these rules. The next section describes Tumwater's current water conservation program, estimates water savings derived from these efforts and evaluates progress toward Tumwater's current conservation goals. The last component of this chapter discusses Tumwater's revised water conservation goals, outlines water conservation measures that will be used to achieve the goals, and quantifies the water savings that will be achieved by implementing these measures.

3.1 Water Use Efficiency Requirements and Compliance Summary

The State of Washington recently revised water conservation planning requirements as a result of the 2003 Municipal Water Law and in January 2007 adopted new water use efficiency regulations packaged as the Water Use Efficiency (WUE) Rule. The Water Use Efficiency Rule has several requirements that correspond with specific compliance deadlines. While some of the requirements, such as conservation goal setting and demand forecasting are associated with the water system plan specifically, other requirements, such as metering, data collection, distribution system leakage and annual performance reports are independent of the six year water system planning cycle.

The Water Use Efficiency Rule has seven major categories of requirements.

- Meters
- Data collection
- Distribution system leakage
- Goals
- Efficiency program
- Demand forecast
- Performance reports

Table 3-1 lists the requirements of the Water Use Efficiency Rule and reflects Tumwater's level of compliance with these requirements.

Table 3-1 Compliance with Water Use Efficiency Rule Requirements

Category	Requirement	Tumwater Compliance Status
Meters	Meter all sources .	Yes , all sources are metered.
	Meter all service connections .	Yes , all service connections are metered.
Data Collection	Provide annual consumption by customer class .	Yes , provided in Section 2.2
	Provide “seasonal variations” consumption by customer class.	Yes , provided in Section 2.2
	Evaluate reclaimed water opportunities.	Yes , provided in Section 5.2
	Consider water use efficiency rate structure .	Yes , Tumwater’s rate structure is conservation based.
	Provide monthly and annual production for each source.	Yes , provided in Section 2.2
Distribution System Leakage	Calculate annual volume and percent using formula defined in the Rule.	Yes, distribution system leakage is calculated and reported to DOH on an annual basis.
	Report annually: annual leakage volume, annual leakage percent, and for systems not fully metered, meter installation progress and leak minimization activities.	
	Develop water loss control action plan (if leakage is over 10% for 3 year average).	
Goals	Establish measurable (in terms of water production or usage) conservation goals and re-establish every 6 years. Provide schedule for achieving goals.	Yes , measurable goals were established via a public process. See section 3.3
	Use a public process to establish goals.	
	Report annually on progress.	Yes , report submitted annually to DOH
Efficiency Program	Describe existing conservation plan.	Yes , provided in Section 3.2
	Estimate water saved over last 6 years due to conservation program.	Yes , provided in Section 3.2
	Describe conservation goals .	Yes , provided in Section 3.3
	Implement or evaluate 1-12 measures , depending on size. (Six measures for Tumwater.	Yes , Tumwater is required to implement or evaluate six measures. See Section 3.3
	Describe conservation programs for next 6 years including schedule, budget, and funding mechanism.	Yes , provided in Section 3.3
	Describe how customers will be educated on efficiency practices.	
	Estimate projected water savings from selected measures.	Yes , provided in Section 3.3
	Describe how efficiency program will be evaluated for effectiveness.	N/A . All leakage is included in the distribution system leakage number.
	Estimate leakage from transmission lines (if not included in distribution system leakage).	

Category	Requirement	Tumwater Compliance Status
Demand Forecast	Provide demand forecast reflecting no additional conservation.	Yes, provided in Section 2.3
	Provide demand forecast reflecting savings from efficiency program.	
	Provide demand forecast reflecting all “cost effective” evaluated measures.	N/A. Since Tumwater is implementing the required minimum number of measures, this forecast is not required.
Performance Reports	Develop annual report including: goals and progress towards meeting them, total annual production, annual leakage volume and percent and, for systems not fully metered, status of meter installation and actions taken to minimize leakage.	Yes, Tumwater has submitted annual performance reports beginning in 2008.
	Submit annually by July 1 to DOH and customers and make available to the public.	

3.2 Existing Water Conservation Program

3.2.1 Conservation Measures

Tumwater’s existing conservation program consists of 14 different conservation measures, many of which are targeted at multiple customer classes. Six of these conservation measures are regional in nature, while eight measures are implemented by Tumwater independently. A summary of the conservation measures which Tumwater has implemented in the last six years is shown in Table 3-2. Each measure is discussed in detail below.

Table 3-2 Existing Conservation Program

Measure	Customer Class ¹			Local or Regional	Years Implemented					
	SF	MF	NR		2004	2005	2006	2007	2008	2009
1. Conservation Pricing	X	X		Local	X	X	X	X	X	X
2. Public Outreach	X	X	X	Both	X	X	X	X	X	X
3. Utility Bill with Consumption History	X	X	X	Local	X	X	X	X	X	X
4. Irrigation Audits			X	Local	X	X	X	X	X	X
5. Outdoor Water Saving Kits	X	X	X	Local	X	X	X	X	X	X
6. Rain Barrel Rebates	X	X		Local	X	X	X	X	X	X
7. Irrigation Timers	X	X		Local	X	X	X	X	X	X
8. Speakers Bureau	X	X	X	Local	X	X	X	X	X	X
9. Indoor Water Saving Kits	X	X		Both	X	X	X	X	X	X
10. Washwise Rebates	X			Regional	X	X	X	X	X	X
11. WaterSmart Rebates			X	Regional	X	X	X	X	X	X
12. Toilet Retrofits		X	X	Regional					X	X
13. Composting Toilet Rebate	X			Regional				X	X	X
14. Demonstration School			X	Regional						X

1. SF = single family, MF = multi-family, NR = non-residential

1. Conservation Pricing

A conservation based rate structure can effectively reduce water consumption. Both increasing block rate structures and rate structures that increase with seasonal demands are considered conservation based formulas. Since 1997, the City has operated under a tiered rate structure for residential customers that incorporate four increasing block rates. These rates are shown in tables 3-3 and 3-4. Specifically, blocks three and four are designed to curb excess water usage, with block three water rates at 132% of block one rates, and block four rates fixed at 173% of block one rates.

In addition to the block rate structure utilized for residential customers, a separate rate is utilized for irrigation customers. This rate is a uniform rate and does not change with increased usage. The irrigation rate is set at 132% of block one residential rates.

Table 3-3 2009 Single Family Tiered Rate Structure

	Volume of Water Used (Cubic Feet)	Charge per Each 100 Cubic Feet
Block 1	0-600	\$1.69
Block 2	601-1,200	\$1.87
Block 3	1,201-2,400	\$2.23
Block 4	2,401 & Greater	\$2.92

Table 3-4 2009 Multi-Family Tiered Rate Structure

	Volume of Water Used (Cubic Feet)	Charge per Each 100 Cubic Feet
Block 1	0-500	\$1.69
Block 2	501-1,000	\$1.87
Block 3	1,001-2,000	\$2.23
Block 4	2,001 & Greater	\$2.92

2. Public Outreach

Tumwater currently has an active water conservation outreach program that includes program promotion at local events, school outreach activities, brochures and outreach articles, as well as several regional outreach campaigns such as bus ads and a variety of cooperative workshops that focus on wise water use.

Water conservation messages are periodically distributed via water bill inserts and the annual water quality report. Additionally, several brochures are available at City Hall for the general public.

Regionally, the City of Tumwater partners with the Partnership for Water Conservation and the LOTT Alliance on water conservation outreach efforts, including bus ads and local media campaigns. Tumwater also provides annual support for South Sound GREEN (Global Rivers Environmental Education Network), which is an entity that works with local teachers to train them in water resources issues, including water conservation, so that they can in turn incorporate the information into their curricula.

3. Utility Bill Showing Consumption History

Utility bills documenting historical consumption data allows customers to understand how their use varies throughout the year and from one year to the next. This information helps customers make informed choices about how they manage their water use, including implementing conservation. Tumwater's customer bills include historical consumption data showing consumption for the previous 13 billing cycles.

4. Irrigation Audits

Tumwater offers outdoor irrigation audits to a limited number of non-residential customers each year. The audits target the top 20 annual irrigation based on consumption, but, if budget allows, are offered to any irrigation customer interested in conserving water. The goal of the irrigation audit program is to reduce the peak summer water demand on the City of Tumwater's water infrastructure, as well as promote water conservation practices by educating customers on efficient landscape design, irrigation system maintenance and scheduling.

Irrigation customers who participate in the irrigation audits are eligible for a 50% rebate, up to \$1,000, for implementation of physical system improvements recommended by the audit.

5. Outdoor Water Conservation Kits

Outdoor water saving kits are available to all Tumwater water utility customers. The kits are designed for households with landscape areas, primarily single-family homes that do not have automatic irrigation systems. Customers can choose applicable devices that may include automatic shut-off watering timers, hose-end nozzles, and gauges to measure rainfall and/or sprinkler output. Each customer may receive two kits every two years.

The purpose of the kits is to encourage customers to reduce watering and to use water outdoors more efficiently. Compared to a free-flowing hose, or unattended sprinkler, these kits can help homeowners save on average 5 gallons per minute. The kits are marketed through the annual water quality report, utility brochures, and bill inserts.

6. Rain Barrel Rebates

A rain barrel collects and stores rainwater from rooftops to use later for lawn and garden watering. In addition to this water conservation benefit, rain barrels provide water quality benefits. Water collected in a rain barrel would otherwise flow through roof gutter downspouts and become stormwater runoff, which is the leading cause of non-point pollution to surface waters.

Tumwater administers a rain barrel program that offers \$10 rebates to qualifying customers. Participants are allowed rebates for up to six rain barrels per household. Although individual brands and styles can vary, each rain barrel typically displaces up to 50 gallons of water during the summer season. In addition to actual water savings, rain barrels have the added benefit of sending the message that water is a precious and limited resource.

7. Irrigation Timers

Hose tap irrigation timers are available for both single and multi-family water customers. These timers are easy to use and can be programmed for times between 5 and 120 minutes. These

timers, designed for customers who do not have an irrigation system, can significantly reduce outdoor water use.

8. Speakers Bureau

Tumwater makes available outreach staff to give public presentations regarding water conservation to community groups as requested. These presentations are available to groups such as community colleges, civic groups and local media outlets. Education of these groups plays a vital role in raising public awareness regarding the need for the efficient use of water.

9. Indoor Water Saving Kits

The City has distributed free indoor water conservation kits to single-family and multi-family sewer customers through the LOTT Wastewater Alliance since 1997.

Additionally, Tumwater offers indoor water conservation kits to water utility customers who are not served by sanitary sewer.

Both the LOTT-sponsored and City of Tumwater kits include a low-flow showerhead, one kitchen faucet aerator, two bathroom faucet aerators, plumbing tape and leak detection tablets. The average annual estimated water savings accumulated through this program is 17 gallons per household per day. Since 1997, approximately 895 Tumwater homes have received indoor water saving kits, translating to an estimated accrued annual water savings of 14,845 gallons per day.

10. Washwise Rebates

Tumwater partners with the LOTT Alliance to provide rebates of \$100 to single-family residential customers for the purchase and installation of water-efficient washing machines. The eligibility of machines is determined by using the list developed and maintained by the Consortium for Energy Efficiency (CEE), an independent organization that rates energy and water efficiency for various appliances. Since 1999, a total of 763 Tumwater water utility customers have participated in the Washwise program. With the average water savings from each of the washing machines estimated at 11.7 gallons per day, this program translates to an estimated accrued water savings of 104,630 gallons per day.

11. WaterSmart Rebates

The City also partners with the LOTT Alliance on a non-residential rebate program. The WaterSmart program provides rebates of up to 75% to non-residential customers for the installed cost of systems, appliances, equipment, or fixtures that reduce wastewater flows to the regional wastewater facility. Incentive levels are determined based upon cost-effectiveness criteria. Resulting customer payback periods for their portion of the project cost must not be less than six months. The intent of the program is to provide incentive for those customers who would not otherwise implement a water saving project. To date, the City has worked with restaurants, churches, and medical facilities to achieve substantial water savings.

12. Toilet Replacements

Toilet usage on average accounts for nearly 30% of indoor water use. Tumwater partners with the LOTT Alliance on a high efficiency toilet direct install program for both non-residential and

multi-family customers. Under this program, the LOTT Alliance contracts with a wholesale supplier and plumber to provide and install high efficiency toilets in place of older 3.5 gallon and higher models. City of Tumwater personnel assist with the program by marketing the program and verifying eligibility. Depending upon the nature of the business, each retrofit is estimated to save roughly 8,100 gallons annually.

13. Composting Toilet Rebate

Tumwater partners with the LOTT Alliance to provide \$350 rebates to single family residential customers who purchase and install one of the composting toilet models approved by the Washington State Department of Health. To date, no rebate requests have been received for this program, however the potential water savings involved with this program may attract interest in the future.

14. Demonstration School

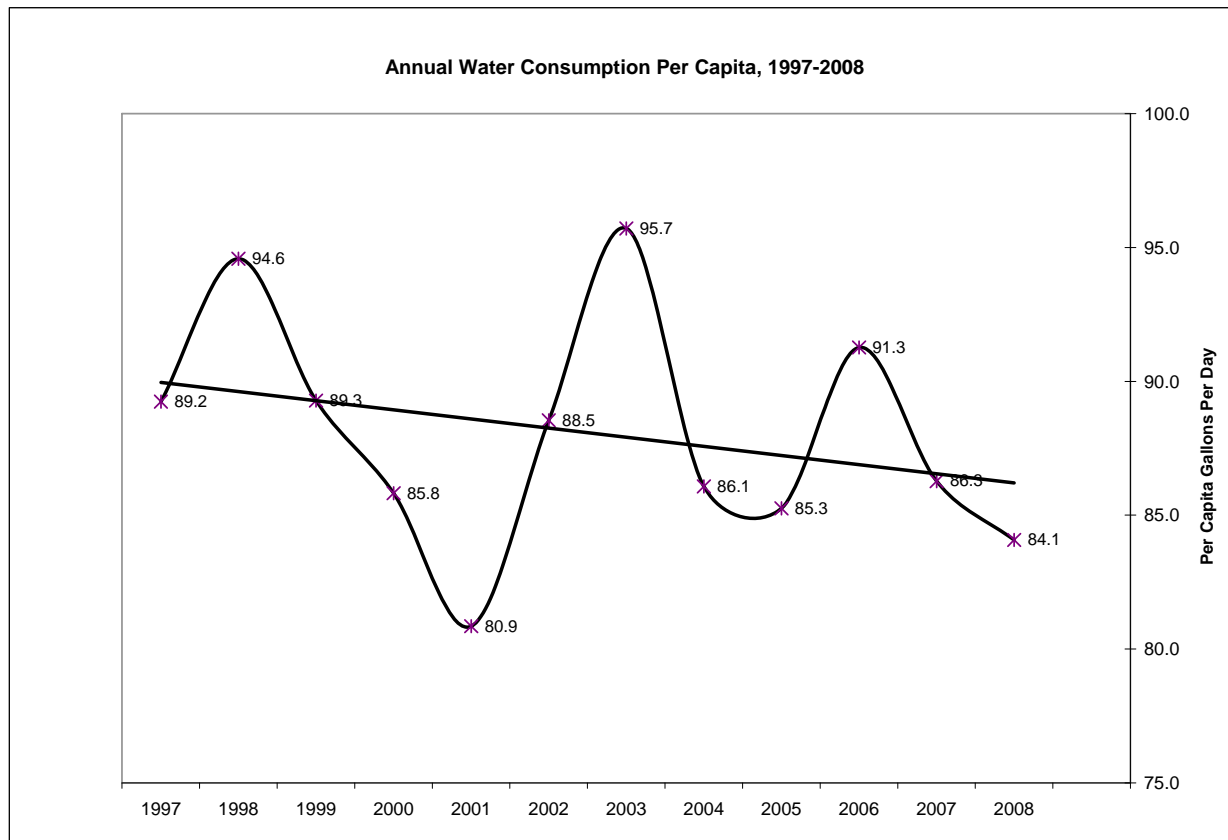
Through its partnership with the LOTT Alliance, Tumwater offers a demonstration school water conservation project. One public school within the water service area will be retrofitted with water saving equipment and fixtures at no cost to them. The concept of this program is that in addition to providing immediate water savings, the school will then serve as a model to the public regarding water conservation and the use of highly efficient fixtures. Since public schools are used to a high degree by the general public for both school and non-school functions, the opportunity for the public to learn about the performance of various water saving technologies is substantial.

3.2.2 Estimated Water Savings

The City of Tumwater has made steady progress with water efficiency both in terms of production per connection, as well as per capita residential use. For the most recent six years, water production per connection decreased from 189,665 gallons in 2003, to 160,947 gallons in 2008, which is a 15.2% reduction.

Residential water consumption per capita has also declined since implementation of Tumwater's conservation program in 1997. As shown in Figure 3.1, residential per capita consumption has decreased from 89.2 gpd in 1997 to 84.1 gpd in 2003, which is a 5.7% reduction. For purposes of determining population served, it is assumed that 100% of the in-City population is served by Tumwater. Any population within this parameter served by private water systems is believed to be insignificant. For out of City connections, the population served number was determined by multiplying the number of connections by 2.5 residents, which is the current estimated County population per household value determined by the Thurston Regional Planning Council. Periodic deviations in this otherwise consistent trend are the result of increases in consumption during years with higher than normal summer temperatures (1998 and 2003), and lower consumption occurring with cooler summer temperatures as seen in 1999-2002, 2005 and 2007.

Figure 3.1 Annual Residential Water Consumption Per Capita, 1997-2008



Based upon Thurston Regional Planning Council data for in-city population, combined with total county connections multiplied by 2.5 persons per connection.

3.3 2010-2015 Water Conservation Program

3.3.1 Conservation Goals

The City of Tumwater's water conservation program is primarily driven by two factors. First and foremost, the City has a long history of valuing, protecting and preserving local water resources, and continues to do so through conservation goal setting. Secondly, recent additions of State mandated water use efficiency requirements have necessitated the need to remain in compliance with these regulatory benchmarks.

Individual factors should always be considered when developing a water conservation program. Conservation drivers vary among utilities depending upon individual circumstances, and may include the meeting of regulatory requirements, protection of water resources, decreasing operating costs, deferring capital costs, and obtaining new water supply.

The City's first water conservation goal as required under the Water Use Efficiency Rule was adopted by the Tumwater City Council, following a public hearing on February 19, 2008, and established an indoor water conservation goal of 77,380 gallons per day in indoor savings by the end of 2012. This conservation goal was determined by evaluating Tumwater's portion of regional wastewater flow to the LOTT treatment facility, currently 14.6%, and applying the same

percentage to the flow reduction goal outlined in LOTT's Water Conservation Plan and adopted by the partner utilities, which outlined a goal of 530,000 gallons per day reduction by the end of 2012. The City of Tumwater's 2008 goal recognizes the need for, and discusses current conservation practices for outdoor water conservation, but stopped short of establishing outdoor water conservation goals.

For the 2010-2015 planning period, the City of Tumwater's goal is to incorporate outdoor water use reduction practices to go above and beyond the original 2008 goal which incorporated indoor conservation solely. The combined estimated reduction based upon both indoor and outdoor conservation measures is 110,280 gallons per day by the end of the 2015 calendar year. As previously discussed, 77,380 gallons per day will be achieved through indoor conservation measures, and is based upon Tumwater's percentage of contribution to regional wastewater collection. The outdoor portion of our conservation goal is 32,900 gallons per day. The outdoor goal was obtained by subtracting average winter day use from average peak day use, to determine an average outdoor use of 3.29 mgd, and by applying a conservation goal of 1% to this number.

It is important to note that, as previously stated, a significant portion of funding for indoor water conservation is derived through the City of Tumwater's continued partnership with the LOTT wastewater utility. The LOTT Alliance currently has an active water conservation plan that is valid through the 2012 calendar year, which is three years short of Tumwater's water conservation planning cycle of 2010-2015. Although it is understood, and fully expected, that the LOTT Alliance will continue their financial support of regional water conservation efforts that affect wastewater discharge, it is important to note that a number of indoor conservation measures, including the WaterSmart and Washwise programs, would be substantially impacted if the financial support and cooperation of the LOTT Alliance were not extended beyond 2012.

It is also important to note that an independent water conservation goal is associated with the Lakeland Manor Water System. This relatively small water system (44 residential connections), was acquired by the City of Tumwater in 2008 and is currently being operated and managed by the City. Following a public meeting with Lakeland Manor residents, a conservation goal of 3 percent reduction of 2010 consumption levels by the end of 2015, was proposed for adoption. It was further recommended that, due to consumption and production meter totals for a full calendar year not being available until the end of 2010, that the goal should be re-visited in 2012 to determine appropriateness.

Both water conservation goals will be reviewed and adopted through the public process used to review and adopt this Water System Plan Update.

3.3.2 Conservation Measures

The City of Tumwater's water conservation program for the 2010-2015 planning period will consist of the 17 measures shown in Table 3-5. These measures have been selected due to a combination of factors that include applicability to Tumwater's service area, customer acceptance, cost effectiveness, and/or savings potential. The first fourteen measures are all currently being utilized, and will continue to be evaluated and administered during the 2010-2015 planning period. Individual descriptions of potential new measures are discussed below. Although the use of source meters, service meters and system leak detection and repair are not considered conservation measures under the new Water Use Efficiency Rule, the City of Tumwater will continue to use these activities as part of its water management program.

Table 3-5 2010-2015 Water Conservation Program

Measure	Customer Class			Local or Regional	Status
	SF	MF	ICI		
1. Conservation Pricing	X	X		Local	Ongoing
2. Public Outreach	X	X	X	Both	Ongoing
3. Bills Showing Customer History	X	X	X	Local	Ongoing
4. Irrigation Audits		X	X	Local	Modified
5. Outdoor Water Saving Kits	X	X	X	Local	Ongoing
6. Rain Barrel Rebates	X	X		Local	Ongoing
7. Irrigation Timers	X	X		Local	Ongoing
8. Speakers Bureau	X	X	X	Local	Ongoing
9. Indoor Water Saving Kits	X	X		Both	Ongoing
10. WashWise Rebates	X	X		Regional	Modified
11. WaterSmart Rebates			X	Regional	Modified
12. Toilet Replacement	X	X	X	Regional	Modified
13. Composting Toilet Rebates	X	X	X	Regional	Modified
14. Demonstration School			X	Regional	Ongoing
15. Customer AMR-Based Leak Detection	X	X	X	Local	New
16. Efficient Landscape Program	X	X	X	Local	New
17. Irrigation Equipment Rebates	X	X	X	Local	New
18. Landscape Efficiency Ordinance	X	X	X	Local	New

1. SF = single family, MF = multi family, NR = non-residential.

1. Customer AMR-Based Leak Detection

The City is in the process of upgrading all service meters to Automatic Meter Reading (AMR) technology. AMR provides a unique tool in that the meters may be programmed to indicate consumption that is substantially higher than normal, as well as continual run trends, thereby allowing Tumwater to alert customers about possible leaks. Upon completion of the upgrade to AMR technology, Water Resources staff will coordinate with the Finance Department to develop the best approach for identifying potential leaks and notifying respective customers of water leaks. In addition to providing potential immediate repair to leaks that may otherwise remain undetected, the use of this technology may assist Water Resources staff in targeting other water conservation programs such as toilet replacement programs.

2. Efficient Landscape Program

Irrigation and landscape maintenance contractors who are not trained in water efficient landscape management practices can contribute significantly to outdoor water overconsumption. Several independent national and regional organizations, such as the Irrigation Association and the Washington Association of Landscape Professionals have certification programs designed to properly train and certify contractors in topics such as irrigation design, installation, scheduling and maintenance, as well as proper landscape design and maintenance with respect to water conservation. The efficient landscape program will work to educate and inform contractors and property managers as to the benefit of selecting qualified

companies to perform landscape and irrigation related projects. Through workshops, media campaigns and interaction with the landscape and irrigation industry, Tumwater will stress the importance of choosing qualified contractors or researching proper methods prior to undertaking a landscape or irrigation project.

For the 2010-2015 planning period, Tumwater will coordinate with other local jurisdictions to promote these training and educational opportunities through independent sources at a local level, and will further promote the use of certified professionals by the public.

3. Irrigation Equipment Rebates

Weather based irrigation controllers have substantial potential for minimizing over-consumption by both residential and commercial irrigation systems. The City of Tumwater will establish a program during the 2010-2015 planning period that will offer rebates for approved weather based controller upgrades to irrigation systems.

4. Landscape Efficiency Ordinance

During the 2010-2015 planning period, the City of Tumwater plans to develop a landscape efficiency ordinance that would require more efficient landscape and irrigation design and operation in new construction. By requiring that landscapes are designed with sound water use practices in mind, as well as insuring that installed irrigation systems meet minimum distribution uniformity guidelines, substantial water savings from outdoor uses may be realized. The landscape efficiency ordinance may be partnered with the contractor certification program to further promote wise planning and operation strategies for landscape maintenance.

3.3.3 Estimated Water Savings

The estimated water savings through implementation of Tumwater's water conservation program are shown in Figure 3.2. By the end of 2015, estimated water savings are anticipated to be 110,280 gallons per day, which equates to 40,252,220 gallons annually. This estimated savings is based upon the difference between average consumption over the 2003-2008 planning period, multiplied by a growth factor determined by the Thurston Regional Planning Council. This potential increase in water use is represented in Figure 3-2 as Consumption without Conservation. To represent potential water savings that would result from full realization of Tumwater's goal, expected annual water savings has been represented as Consumption with Conservation

Progress toward meeting the conservation goals will be reviewed annually using billing system and production data.

Figure 3.2 Estimated Savings from Water Conservation Program

