

Conservation Program Development and Implementation

Introduction

Development and implementation of a water use efficiency (WUE) program is required by the DOH for approval of a water system plan. It is also required by the Department of Ecology (Ecology) when applying for new water rights. The applicable conservation program requirements and guidelines are contained in *Water Use Efficiency Guidebook*, Third Edition, May 2016 (DOH 331-375).

The requirements for a conservation program vary based upon water system size and whether or not additional water rights will be needed within twenty years. In all cases, the larger the size of the system, the more detailed and comprehensive the program. Additionally, if water rights are identified as being necessary within twenty years in the system's water demand forecast, the conservation planning must also include WUE measures as part of the supply alternatives evaluation.

A conservation program, as presented in this chapter, is one of the three required elements of a conservation plan. The other two elements, water use data collection and water demand forecasting, are discussed in Chapter 2, *Basic Planning Data and Water Demand Forecasting*.

Water Use Efficiency Requirements and Compliance Summary

In 2003, the Washington State Legislature passed Engrossed Second Substitute House Bill 1338, better known as the Municipal Water Law, to address the increasing demand in the State's water resources. The law established that all municipal water suppliers must use water efficiently in exchange for water right certainty and flexibility to help them meet future demand. The Legislature directed DOH to adopt an enforceable conservation program, which became effective on January 22, 2007. Table 4-1 summarizes the conservation program requirements and the City's compliance status for each requirement.

Table 4-1. Summary of Water Use Efficiency Program Requirements and Compliance Status

Category	WAC ¹ Section	Requirement	Yakima in Compliance?
1. Meters	246-290-496	1. Meter all sources .	Yes, See Section 4.1.3
		2. Meter all service connections .	Yes, See Section 4.1.3
2. Data Collection	246-290-100	1. Provide monthly and annual production/purchase numbers for each source.	Yes, See Table 2-4
		2. Provide annual consumption by customer class.	Yes, See Table 2-10
		3. Provide " seasonal variations " consumption by customer class.	Yes, See Figure 2-2
		4. Provide annual quantity supplied to other public water systems .	Yes, See Table 2-6
		5. Evaluate reclaimed water opportunities.	Yes, See Section 4.1.6
		6. Consider water use efficiency rate structure .	Yes, See Sections 4.1.3 and 4.1.4
3. Distribution System Leakage	246-290-820	1. Calculate annual volume and percent using formula defined in the WUE Rule.	Yes, See Table 2-6
		2. Report annually: annual leakage volume, annual leakage percent, and, for systems not fully metered, meter installation progress and leak minimization activities.	Yes, See annual WUE Reports
		3. Develop water loss control action plan (if leakage is over 10% for 3 year average).	Yes, See Section 4.1.5
4. Goals	246-290-830	1. Establish measurable (in terms of water production or usage) conservation goals and re-establish every 10 years. Provide schedule for achieving goals.	Yes, See Section 4.1.4
		2. Use a public process to establish the goals.	Yes, See Section 4.1.4
		3. Report annually on progress.	Yes, See annual WUE Reports

Table 4-1. Summary of Water Use Efficiency Program Requirements and Compliance Status (Cont'd.)

Category	WAC ¹ Section	Requirement	Yakima in Compliance?
5. Conservation Program	246-290-810	1. Describe existing conservation program.	Yes, See Section 4.1.3
		2. Estimate water saved over last 6 years due to conservation program.	Yes, See Section 4.1.3
		3. Describe conservation goals .	Yes, See Section 4.1.4
		4. Implement or evaluate 9 measures (relating to the following sectors: residential, outdoor, and industrial/commercial).	Yes, See Table 4-3
		5. Describe conservation programs for next 10 years including schedule, budget, and funding mechanism.	Yes, See Section 4.1.4
		6. Describe how customers will be educated on efficiency practices.	Yes, See Section 4.1.4
		7. Estimate projected water savings from selected measures.	Yes, See Section 4.1.4
		8. Describe how efficiency program will be evaluated for effectiveness.	Yes, See Section 4.1.4
		9. Estimate leakage from transmission lines (if not included in distribution system leakage).	N/A, all leakage is included in the distribution system leakage number.
6. Demand Forecast	246-290-100	1. Provide demand forecast reflecting no additional conservation .	Yes, See Table 2-17
		2. Provide demand forecast reflecting savings from efficiency program .	N/A, See Section 4.1.4. WUE measures are intended to maintain the already low per capita water use levels. Therefore, no additional savings are expected.
		3. Provide demand forecast reflecting all "cost effective" evaluated measures , if not implementing the minimum number of measures.	N/A, the City plans to implement at least 9 measures.
7. Performance Reports	246-290-840	1. 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, See annual WUE Reports
		2. Submit annually to DOH and customers and make available to the public.	

1. Washington Administrative Code.

Historical Conservation Program

Historical Program Measures

DOH requires systems with more than 10,000 service connections (such as the City of Yakima) to implement at least nine WUE measures. These nine WUE measures are in addition to the mandatory supply-side measures required under the WUE Rule. The City's recent conservation program has consisted of WUE measures across multiple customer classes. Specific WUE measure implemented for different customer classes, count as multiple WUE measures. For example, the City has implemented a conservation rate structure for single family, multifamily, and nonresidential customers. Therefore this counts as three WUE measures. A summary of these measures over the last six years is shown in Table 4-2. The details of each measure are discussed below.

Table 4-2. Historical Conservation Program Summary (2010-2015)

Measure	Sectors ¹			Years Implemented					
	SF	MF	NR	2010	2011	2012	2013	2014	2015
Mandatory Measures									
1. Source Meters	n/a			X	X	X	X	X	X
2. Service Meters	X	X	X	X	X	X	X	X	X
3. Meter Calibration	X	X	X	X	X	X	X	X	X
4. System Leak Detection and Repair	n/a			X	X	X	X	X	X
Water Use Efficiency Measures									
5. Conservation Rate Structure	X	X	X	X	X	X	X	X	X
6. Bills Showing Consumption History	X	X	X	X	X	X	X	X	X
7. Educational Bill Inserts	X	X		X	X	X	X	X	X
8. Conservation Outreach	X	X	X	X	X	X	X	X	X
9. Use of Reclaimed Water	n/a			X	X	X	X	X	X

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

1. Source Meters

Source meters are a critical conservation tool since accurate water production data is used in developing conservation priorities, goals, and programs. The City has source meters on its Naches River WTP and all of its wells. All of these meters are verified by a third party contractor on a bi-annual basis.

2. Service Meters

Service meters at customer connections are another key component of providing accurate water information for conservation planning. The City has meters on all service connections. Over the past 6 years, the City replaced or upgraded all of the existing meters with advanced metering infrastructure (AMI) (discussed further in Section 4.1.4).

3. Meter Calibration

The City has conducted audits to determine proper meter size and has replaced over 200 meters with smaller meters that improve accuracy for those users. The City has also implemented an intensive meter calibration program for all meters over 1.5 inches. These efforts enable the City to more accurately measure water consumption and provide the basis for detecting leaks and evaluating conservation opportunities.

4. System Leak Detection and Repair

The City has conducted an extensive and ongoing leak detection program. The program has used extremely sensitive sound amplification instruments and a computer-based leak correlation program to help pinpoint the location of leaks. Approximately 220 miles of the distribution system (90 percent of the total system) were included in the program. In this program, 85 leaks were detected and repaired in water mains, meters, hydrants, service lines, service connections, and valves. It should be noted that repair of these leaks did not significantly reduce the observed distribution system leakage (DSL). As such, the City anticipates that DSL is due to inaccuracies in meter reading and the City's billing system. In addition, the City's leak detection program includes conducting leak detection surveys every few years. The City's leak detection efforts are described further in Section 4.1.5.

5. Conservation Rate Structure

In October 2007, the City conducted a Cost of Services and Rate Study which established a transition to a conservation rate structure. In 2009, the City switched from a declining block rate structure to a single block conservation rate structure. This rate structure applies to residential and nonresidential customers. The City completed a rate study in 2012 and an update in July 2013 that analyzed additional conservation rate options. Sewer use charges are linked to water consumption. This is an additional incentive to conserve water because sewer use rates are higher than the water rates per hundred cubic feet.

6. Bills Showing Consumption History

In 2010, the City began including consumption history in utility bills for both residential and industrial/commercial customers. In 2015, the City established an internet portal that customers can access to view their billing records and water use.

7. Educational Bill Inserts

The City distributes bill inserts providing water system users with information on water efficiency measures. The inserts also direct customers to the City's website for additional information on leak detection and additional water efficiency measures.

8. Additional Conservation Outreach

The City has implemented a number of public outreach activities aimed at conveying water conservation messages. These activities include the following:

- **Brochures:** Since 1989, the City has distributed water conservation brochures to educate the public about water conservation, promoting indoor and outdoor conservation practices. These brochures have been distributed by city staff and displayed on the City's website and at the Utility Billing, Public Works, and City Clerk's offices.
- **WaterSense Program:** The City of Yakima joined the WaterSense program in September 2010. WaterSense is an EPA-sponsored partnership program, launched in 2006, that seeks to protect the future of our nation's water supply by promoting water efficiency and enhancing the market for water-efficient products, programs, and practices. The City has continued to promote this program to help water users identify

water-efficient products and programs that meet the WaterSense water efficiency and performance criteria. In addition, the City has adopted the 1993 Uniform Building Codes which mandate low use plumbing fixtures.

- **Water Conservation Website:** The City encourages a conservation ethic through its website which provides customers with indoor and outdoor water conservation guidance and recommendations.
- **Integrated Plan Partnership:** In 2009, the City partnered with the U.S. Bureau of Reclamation, Ecology, and other stakeholders in the Yakima River basin to develop the Yakima Basin Integrated Plan (described in Section 1.4.9). The Integrated Plan provides a comprehensive approach for addressing the basin's water resource problems and ecosystem restoration needs. An element of the Integrated Plan is to enhance municipal water conservation in the basin. As part of this effort, the City has partnered with other municipalities and agencies in the basin to identify best management practices for water conservation and develop basin-wide resources that promote municipal water conservation. For example, in 2015, the City worked with Integrated Plan partners to produce a water conservation brochure that was distributed throughout the basin.
- **Outreach Letters:** In 2015, the City distributed water conservation letters to local government entities, schools, and community groups to help promote efficient water use. This letter encouraged customers to conserve water, especially during periods of drought, and provided recommendations for implementing conservation measures.

9. Use of Reclaimed Water

All water from a potable source used at the wastewater treatment plant (WWTP) is metered. Since the late 1970s, reclaimed water has been used for all wash downs and for irrigation at the WWTP. The WWTP uses 1.0 to 1.3 million gallons (MG) of reclaimed water a day.

Historical Conservation Program Savings

The City's historical conservation program has focused largely on promoting a conservation ethic within the City through the use of price signals and educational outreach. Water savings associated with promoting a conservation ethic can be difficult to quantify. In 2004, the City established a residential water use goal of 74.9 gallons per capita per day (gpcd). Since 2004, per capita water use has gradually declined from an estimated 78.8 gpcd in 2004 to 71.7 gpcd in 2015. These estimates are based on total residential consumption and water service area population in these years. This shows a reduction of approximately 7.1 gpcd over the last 12 years. Since 2009, per capita water use has declined by approximately 3.7 gpcd. The City has been able to achieve this goal despite moderate population growth in the water service area. This reduction in water use is likely partially attributed to the City's conservation program. However, the City recognizes that reductions in water use are also influenced by other factors, such as the proliferation of more efficient appliances and fixtures, drought conditions such as those that affected the region in 2015, and the 2008 economic recession and its lingering social and economic effects.

Between 2004 and 2009, the average annual DSL estimate was 19.5 percent. Between 2010 and 2015, the average annual DSL estimate was 10.8 percent. This suggests a reduction in DSL of approximately 8.7 percent over the last 12 years. This reduction in DSL has likely contributed to the reduction in per capita water use. However, it should be noted that DSL estimates between 2004 and 2015 have been highly variable, ranging from 31.7 percent in 2008 to 3.1 percent in 2012. Ongoing leak detection efforts over the years have failed to identify any significant amounts of actual leakage in the distribution system. Therefore, it is likely that the variability in estimated DSL can be attributed to the City's billing system not recording all water sales. Therefore, efforts to better understand and reduce DSL have focused initially on upgrading the billing system and undertaking a meter replacement program. The City implemented a new utility billing system in 2016, making it possible to

better account for water use. The City also completed implementation of its AMI system in 2016. While a portion of this reduction in DSL is likely due to the implementation of WUE leak detection measures, it will be difficult to quantify these reductions until the new billing system and AMI system are fully operational.

The City has also generated potable water savings through the use of reclaimed water at the City's WWTP. The WWTP currently uses approximately 1.0 to 1.3 MG of reclaimed water a day for facility operation and irrigation. By using reclaimed water at the WWTP, the City is able to reduce the demand on the potable water system which would have been used if reclaimed water had not been available.

Conservation Program (2018-2027)

The elements included in the conservation program include the following:

- Conservation Program Goals and Objectives
- Evaluation of WUE measures
- Selection of WUE measures for implementation

These elements are outlined in the following subsections.

Water Use Efficiency Program Goals and Objectives

The regulation (WAC 246-290-830) requires the governing body of the municipal water system (the Yakima City Council in this case) to establish WUE goals through a public process. The WUE goals were re-evaluated as part of this 2017 Water System Plan update and will be discussed in a public hearing as part of the City Council meeting adopting this plan. A copy of the Council Action Minutes from that meeting and a signed copy of the resolution adopting the Water Use Efficiency Goals are included in Appendix B. The hearing allowed for public input on the proposed goals. The WUE goals established through this process are as follows:

1. Reduce DSL to 10 percent or less by January 1, 2019
2. Maintain a residential water use goal of 74.9 gpcd

In addition to these goals, the City has established four main objectives for its conservation program:

1. Minimize impact of conservation program on domestic water rates
2. Encourage conservation ethic through increased customer awareness
3. Reduce commercial and industrial water consumption
4. Comply with DOH guidelines and state law

Evaluation of Water Use Efficiency Measures

DOH requires systems with more than 10,000 service connections (such as the City of Yakima) to implement at least nine WUE measures. Specific WUE measure implemented for different customer classes, count as multiple WUE measures. The evaluation and selection of measures relates to the cost-effectiveness of the measures.

During the preparation of the 2004 water system plan update, the City evaluated an initial list of 25 potential conservation measures. The list included measures implemented by other northwest water utilities and the minimum program measures required by DOH. From these 25 measures, the measures that were deemed to be applicable to Yakima were placed on a "short list" for more detailed evaluation. From this list, the City selected those measures to

implement that were cost-effective for their system (see Section 4.1.3 for summary of historical conservation measures).

During this water system plan update, the City considered historical conservation measures and potential new measures that contribute to the conservation goals and objectives. Based on this, the City selected measures for implementation over the next 10-year planning period. Table 4-3 summarizes the measures that the City selected for 2018 through 2027. The following subsections provide a description of each measure.

Table 4-3. Selected Water Use Efficiency Measures for 2018-2027

Measure	Sectors ¹		
	SF	MF	NR
1. Advanced Metering Infrastructure	X	X	X
2. Conservation Rate Structure	X	X	X
3. Bills Showing Consumption History	X	X	X
4. Educational Bill Inserts	X	X	
5. Conservation Outreach	X	X	X
6. Use of Reclaimed Water	Not broken out by sector.		
7. Low-Water Demonstration Gardens	Not broken out by sector.		
8. Irrigation Efficiency Demonstration	Not broken out by sector.		

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

Measures Selected for the 2018-2027 Conservation Program

1. Advanced Metering Infrastructure

In 2016, the City finished implementing an AMI system. This involved replacing and upgrading all existing water meters. *Components of the AMI system include new water meters, radio transmitters for existing water meters, structures for data collection units, and AMI software.* The AMI system will allow for real-time monitoring and geocoding of consumption data. The system will allow the City to evaluate water use, consumption, and DSL, as needed. The system will also improve the City's ability to evaluate the effectiveness of WUE measures, educate customers about leak detection, and support future water system planning.

2. Conservation Rates

The City plans to continue with the existing single block conservation rate structure. In 2017, the City plans to conduct another Cost of Service and Rate Study. This study will consider additional conservation rate options.

3. Water Bills Showing Consumption History

The City plans to continue to provide customers with water bills that show consumptive history. This measure allows customers to compare the percentage increase or decrease in water use over the same period from the previous year.

4. Educational Bill Inserts

The City plans to continue customer leak detection education using billing inserts. Bill inserts direct customers to the City's website for additional information on leak detection and other water efficiency measures, such as EPA's WaterSense program and Pacific Power and Cascade Natural Gas incentive programs for water efficient fixtures and appliances.

5. Additional Conservation Outreach

The City plans to continue public outreach activities aimed at conveying water conservation messages. These activities include the following:

- **Brochures:** The City plans to continue distributing water conservation brochures to educate the public about water conservation and promote indoor and outdoor conservation practices.
- **WaterSense Program:** The City plans to continue to promote WaterSense to help water users identify water-efficient products and programs.
- **Water Conservation Website:** The City plans to continue encouraging a conservation ethic through its website which provides customers with indoor and outdoor water conservation guidance and recommendations.
- **Integrated Plan Partnership:** As part of the Integrated Plan, the City plans to continue its partnership with other municipalities and agencies in the basin to develop basin-wide municipal conservation resources, advance components of a municipal conservation program, and conduct outreach to water users and elected officials. This will contribute to promoting a conservation ethic within the basin and the City.

6. Use of Reclaimed Water at the Wastewater Treatment Plant

The City plans to continue using 1.0 to 1.3 MG of reclaimed water a day at the WWTP. (See Section 4.1.6 for a discussion of other water reuse options evaluated.)

7. Low-Water Demonstration Gardens

In 2016, the City received a grant from Ecology and other contributors to design and install low-water demonstration gardens. In 2017, the City plans to complete installation of demonstration gardens at the Yakima Public Works office and a downtown site on Yakima Avenue. Each site will include signage to educate the public about low-water landscapes. Photos and information about the gardens will also be posted on the City's website for water users to view.

8. Irrigation Efficiency Demonstration Projects

As described above, the City plans to install demonstration gardens at the Yakima Public Works office and a downtown site on Yakima Avenue. These demonstration gardens will use efficient irrigation system technologies, such as wireless irrigation control systems. Each site will include signage to educate the public about efficient irrigation practices. Photos and information about irrigation efficiency will also be posted on the City's website for water users to reference.

Additional Measures Considered But Not Selected for the 2018-2027 Conservation Program

In addition to the measures selected, the City considered other potential conservation measures. However, due to financial considerations, the City decided not to implement these measures at this time. The following subsections summarize the additional measures that the City considered.

Retrofit Kits and Residential Water Audits

The City considered including retrofit kits, toilet flappers (devices that regulate the amount of time for filling the toilet bowl), and residential water audits in their conservation program for 2018 to 2027. However, the City determined that these measures produce limited water-saving benefits and are expensive to implement. For example, toilet flappers often require installation by utility personnel since those mailed to customer are frequently not installed. Similarly, residential water audits involve hiring a utility representative. Audits typically take approximately one hour and must be applied to many customers. In addition to consultation and installation, the cost of the audit also includes scheduling, follow-up, and the conservation devices. Due to labor costs, the City determined that these measures were not cost-effective at this time.

Commercial/Industrial Audits

Like the residential audits, commercial/industrial can be time-consuming and expensive for the City to conduct. Despite being unable to implement these measures at this time, the City still plans to support reductions in commercial and industrial consumption where possible.

Estimated Conservation Program Savings

Savings from Water Use Efficiency Measures

The City's future conservation program will continue to focus largely on promoting a conservation ethic within the City through the use of price signals and educational outreach. Water savings associated with promoting a conservation ethic are difficult to quantify. Therefore, the savings from educational measures were not quantified as part of this Water System Plan update. The following summarize the expected savings from each WUE measure.

1. **Advanced metering infrastructure:** The City would use AMI data to inform customers of potential leaks. The savings from improved customer leak detection is unknown at this time. The City will be able to quantify these savings after several years of collecting AMI data.
2. **Conservation rates:** The City plans to maintain the existing conservation rate structure. This is expected to sustain existing water use levels.
3. **Water bills showing consumption history:** Water savings are expected as part of promoting a conservation ethic.
4. **Educational bill inserts:** Water savings are expected as part of promoting a conservation ethic.
5. **Additional conservation outreach:** Water savings are expected as part of promoting a conservation ethic.
6. **Use of reclaimed water at the WWTP:** The City plans to maintain the level of reclaimed water use at the WWTP (1.0 to 1.3 MG per day). Over the next ten year planning period, this measure will save approximately 3,650 to 4,745 MG of potable water.

7. **Low-water demonstration gardens:** Water savings are expected as part of promoting a conservation ethic
8. **Irrigation efficiency demonstration projects:** Water savings are expected as part of promoting a conservation ethic

Although it is difficult to quantify the water savings expected from individual WUE measures, the City expects that these measures will help to sustain the water savings achieved through the City's historic conservation program (described in Section 4.1.3). Therefore, the City plans to maintain a residential water use goal of 74.9 gpcd. The 2015 per capita usage was estimated to be 71.7 gpcd (see Table 2-10). The 5 year average (2011 to 2015) per capita usage was estimated to be 70.0 gpcd. This is already a low per capita water use level. The City recognizes that low water usage in recent years may be a short-term response to recent drought and the lingering effects of economic recession. Therefore, it is possible that this low level of water usage does not reflect long-term water use trends. As such, the City anticipates that additional reduction in water use would be difficult to obtain and are likely not financially feasible. This is especially true since the City has a separate irrigation supply, so opportunities to reduce outdoor potable water uses are limited. As such, the WUE measures selected for 2018 through 2027 are intended to maintain the existing per capita water use level. Therefore, no additional water savings are expected from these WUE measures over the next 10-year planning period.

Savings from Improved Leak Detection

The City plans to reduce DSL to 10 percent or less. Based on ongoing leak detection efforts, the City speculates that high DSL estimates are attributed to the City's billing system not recording all water sales. As such, it is likely that actual DSL is already under 10 percent. Efforts to better understand and reduce the DSL have therefore focused on upgrading the billing system and implementing AMI. The City completed implementation of the new billing system and AMI system in 2016. Moving forward, this will allow the City to more accurately estimate DSL and better evaluate the effectiveness of the conservation program. Note that the expected savings from improved leak detection are separate from the savings generated by the WUE measures. Because DSL accounts for a portion of the per capita water use estimate, the new billing and AMI systems will allow the City to determine the accuracy of the current per capita water use estimate and evaluate the effectiveness of WUE measures to determine if a new per capita goal is appropriate. The City will reassess the per capita water use goal after gathering several years of AMI data.

Water Loss Control Action Plan

The City of Yakima established a WUE goal to reduce DSL to less than 10 percent by January 1, 2019. The estimated DSL for 2015 was 14.5 percent (see Table 2-6). The estimated three-year average (2013-2015) DSL was 12.7 percent. This is slightly above the WUE Rule requirement (DSL at 10 percent or less). The City has implemented the following actions to achieve the DSL goal:

- Implementation of a new billing system (put on line in 2016).
- Implementation of an AMI system (fully complete in 2016).
- A new source meter on each of the seasonal wells.
- Ongoing transmission main and distribution system leak detection monitoring and repair.

The City has not detected any significant amount of leakage in either the transmission main or the distribution system. The City anticipates that the apparent DSL is due to the City's billing system not recording all water sales. Implementation of the AMI system and a new utility billing system in 2016 is expected to resolve this issue. The new AMI system will allow real-time water meter reads to be transmitted to the utility billing system, eliminating the need

for manual meter reading. This is expected to improve meter reading and billing accuracy, and enhance identification of customer usage patterns and potential leaks. The city also has a program to calibrate source meters every two years as needed, and to calibrate service meters over 1.5 inches as recommended in the maintenance manuals provided by meter vendors.

Water Reuse

An inventory of the potential sources and uses for reclaimed water is required under WAC 246-290-100 to be included in the conservation plan. Reclaimed water is commonly used for landscape irrigation, agricultural irrigation, or industrial processes. The feasibility of using reclaimed water as a water supply depends upon the quality and quantity of the reclaimed water, the requirements of the intended application site, the economics of treating, supplying, and distributing the reclaimed water, and public acceptance.

A discussion of the regulations governing the use of reclaimed water and the potential sources and uses is presented in the following subsection. The use of reclaimed water was not included in the current conservation plan except for its continued use at the WWTP.

Regulations

In 1996, Chapter 90.46 RCW was enacted by the legislature to address reclaimed water use. In passing this legislation, the legislature has encouraged the development of wastewater reclamation and reuse facilities and the use of reclaimed water for domestic, agricultural, industrial, recreational, and fish and wildlife habitat including wetlands. The legislature directed DOH and Ecology to coordinate efforts towards developing an efficient and streamlined process for creating and implementing processes for the use of reclaimed water.

The legislature declared that the people of the state have a primary interest in the development of facilities to provide reclaimed water to replace potable water in non-potable applications, to supplement existing surface and groundwater supplies, and to assist in meeting future water requirements of the state. The legislature also declared that the use of reclaimed water is not inconsistent with the policy of anti-degradation of state waters as provided under Chapter 90.48 RCW and Chapter 90.54 RCW. Reclaimed water facilities are water pollution control facilities as defined in Chapter 70.146 RCW and are eligible for financial assistance as provided in that RCW.

DOH and Ecology issued final water reclamation and reuse standards in September of 1997 (Publication #97-23). These standards, as directed by the legislature, were the result of a joint effort by Ecology and DOH. While the standards are primarily administered by the DOH for facility plan review, Ecology has state wastewater discharge permitting authority under the provisions of Chapter 90.48 RCW.

The 1997 Reclamation and Reuse Standards establish requirements for wastewater treatment and reuse. A multi-tiered (Class A through D) reclaimed water classification system defines the characteristics of the reclaimed water for each class (defined in Publication #97-23).

Reclamation and reuse regulations specifically identify groundwater recharge as a beneficial use, and reclaimed water can be used to mitigate water rights limitations, should they exist.

Potential Sources

Effluent from wastewater treatment plants is the most common source of reclaimed water for municipal applications; however, other sites may also serve to provide a source of water for reuse, depending on the reliability and treatment requirements of the applied water. The primary source of reclaimed water in the City is the Yakima Regional WWTP, located between Interstate 82 and the Yakima River. The activated sludge plant is operated by the

City and primarily discharges secondary treated effluent into the Yakima River. The WWTP is the most likely source for reclaimed water for additional uses within the City.

Potential Reclaimed Water Users

The feasibility of using reclaimed water depends on the volume and quality of the source, the size and location of suitable application sites and the proximity of the source to the application or use sites. Table 4-4 presents an inventory of potential reclaimed water users located within 2 miles of the WWTP, which was considered to be the most likely source of water. As the distance from the source increases, the economic feasibility of serving reclaimed water typically diminishes unless there is a large, constant user available. Potential users were identified based on maps of the area and a listing of the top 20 water users.

Table 4-4. Potential Reclaimed Water Users within 2 Miles of the WWTP

Application	Number
Golf courses	1
Parks and arboretum	9
Schools	5
Industrial/commercial facilities	4
Nurseries	1
Freeway landscape irrigation	1
Yakima WWTP	1
Misc.-pipeline flushing, street cleaning dust control, etc.	---

There are four industrial/commercial entities with high water use located within a 2-mile radius of the WWTP. Two of these entities are involved with food handling or production. Based on water use patterns, the other two entities appear to predominately consume water for indoor uses, so use of reclaimed water would likely require costly retrofitting of these facilities to install separate reclaimed water plumbing. Based on these considerations, use of reclaimed water at these locations is unlikely at this time.

The remaining reuse applications could potentially use a range of Class A to Class C reclaimed water, depending on the specific water quality requirements of each use as described in the *Water Reclamation and Reuse Standards* (September 1997, Department of Health and Department of Ecology, Publication No. 97-23).

Although use of reclaimed water in Yakima may be technically feasible, some institutional constraints must be considered. The unit cost of potable water is relatively low in Yakima, so the unit cost of reclaimed water may exceed the unit cost of potable water and may be difficult to sell. Although the use of reclaimed water to help meet large-scale agriculture's irrigation needs would likely be acceptable, the quantities of reclaimed water that could be made available may be too small to justify the investment in reclaimed water facilities. The use of reclaimed water to irrigate schools, parks, and other public landscaping may also encounter public skepticism unless it is accompanied by a public education program focused on the safe use of reclaimed water.

In addition, the Bureau of Reclamation monitors return flows on the Yakima River at the Parker gage, downstream from the City of Yakima. Flow levels at the Parker gage contribute to the Bureau of Reclamation's estimate for total water supply available, which is used to establish portioning levels. If the City were to decrease releases from the WWTP, this would

reduce the return flows at the Parker gage. As such, the City would be subject to additional prorationing. Reduction of flows at Parker could also prompt other proratable users to seek remedies from the City.

Based on these considerations, the City does not plan to pursue additional reclaimed water uses, beyond what is currently used at the WWTP, at this time.