Water Use Efficiency Program

INTRODUCTION

The City of Stanwood (City) recognizes that water is a valuable and essential natural resource that needs to be used wisely. This Water Use Efficiency (WUE) program provides an approach to increase water use efficiency within the City's water service area.

BACKGROUND

The Water Use Efficiency Rule

In September 2003, the Washington State Legislature passed the Municipal Water Supply – Efficiency Requirements Act, also known as the Municipal Water Law. The Municipal Water Law required the State to implement the Water Use Efficiency Rule. The intent of this rule is to help reduce the demand that growing communities, agriculture and industry have placed on our State's water resources, and to better manage these resources for fish and other wildlife. Municipal water suppliers are obligated under the Water Use Efficiency Rule to enhance the efficient use of water by the system and/or its consumers.

The Water Use Efficiency Rule applies to all municipal water suppliers and requires suppliers to:

- Develop WUE goals through a public process and report annually on their performance;
- Maintain distribution system leakage at or below 10 percent of production;
- Meter all existing and new service connections;
- Collect production and consumption data, calculate distribution system leakage and forecast demands;
- Evaluate WUE measures; and
- Implement a WUE program.

Water Use Efficiency Program Requirements

The *Water Use Efficiency Guidebook,* originally published by the Washington State Department of Health (DOH) in July 2007 and revised in January 2009, identifies the water use reporting, forecasting and efficiency program requirements for public water systems. A WUE program meeting these requirements is a necessary element of a water system plan as required by the DOH and is necessary to obtain water right permits from the Washington State Department of Ecology (Ecology). The *Water Use Efficiency Guidebook* defines the necessary components of a WUE program as four fundamental elements.

1. Planning requirements that include collecting data, forecasting demand, evaluating WUE measures, calculating distribution system leakage and implementing a WUE program to meet goals.
2. A distribution system leakage (DSL) standard of 10 percent or less based on a 3-year rolling average. For systems with less than 500 connections, the DSL standard may be increased to 20 percent if a request with supporting data is provided to the DOH.
3. Goal setting to provide a benchmark for achievement and to help define the success of the WUE program.
4. Annual performance reporting on progress towards meeting WUE goals.

WATER SUPPLY CHARACTERISTICS

All water supply to the City's water system is provided by four groundwater wells in the East Stanwood Aquifer and one groundwater spring source. The City's oldest source of supply, the Hatt Slough Springs, is located south of the City limits on the south side of the Hatt Slough and provides only a small portion of the total water supply to the system. The main source of supply is from the Bryant Wells, located near State Route (SR) 532 and 268th Street NW. However, Bryant Well No. 2 has declined in capacity and is currently planned for replacement. The Cedarhome Well was recently installed to replace the Sill Well and is located east of Cedarhome Elementary School. Fure Well, which is located within the northeast corner of the City limits, provides a small portion of water supply to the system. A summary of the well sources is shown in **Table 1**, and a more detailed description of each source of supply is provided in **Chapter 2** of the City's *Comprehensive Water System Plan* (WSP).

Table 1
Supply Facilities Summary

Well	Pressure Zone	Year Drilled	Existing Pumping Capacity (gpm)	Well Depth (feet)	Well Diameter (inches)	Pump Type	Pump Motor Size (hp)	Water Treatment[2]	Control Facility
Bryant Well #1	297 Zone	1948	1,350	250	12	Turbine	75	Cl_2/Mn/H_2S/As	Knittle Tanks
Bryant Well #2[1]	297 Zone	1966	350	200	12	Turbine	75	none	Knittle Tanks
Fure Well	297 Zone	1951	100	157	12	Turbine	15	none	Continuous
Hatt Slough Springs	125 Zone	1934	350	n/a	n/a	Centrifugal	10	Cl_2	Continuous
Cedarhome Well	297 Zone	2008	600	490	12 & 16	Turbine	100	Cl_2	Knittle Tanks

1 = Bryant Well #2 is scheduled for replacement.

2 = Cl_2: chlorination; Mn: manganese filtration; H_2S: hydrogen sulfide removal; As: arsenic removal.

The City currently holds several water right permits and certificates for the supply facilities shown in **Table 1**. A summary of these water rights is presented in **Table 2**. The City has acquired water right certificates for all of the sources shown in the table. Additional water rights information for each source may be found in **Chapter 6** and on the certificates, permits and water rights self assessment, which are included in **Appendix I**.

Table 2
Existing Water Rights

DOH No.	Source Name	Permit or Certificate Number	Old Certificate Number	Priority Date	Primary or Supplemental Right	Use	Existing Water Rights			
							Instantaneous		Annual	
							(gpm)	(cfs)	(acre-ft)	(gpm)
S01	Hatt Slough Springs	S1-02432CWRIS	1164 (old permit 1234)	9/28/1928	Primary	Permanent	1,125	2.5	-	-
S02	Bryant No. 1[1]	G1-00741CWRIS	615 (old permit 670)	2/20/1948	Primary	Permanent	2,000	4.5	2,400	1,487
S03	Bryant No. 2[1]	G1-00741CWRIS	615 (old permit 670)	2/20/1948	Primary	Emergency	2,000	4.5	2,400	1,487
S04	Fure Well	G1-01067CWRIS	616 (old permit 976)	2/11/1949	Primary	Emergency	150	0.3	121	75
S07	Cedarhome Well[2] (transferred from Sill Well)	CG1-04239	2986 (Sill Well)	3/6/1956 9/21/2001 (change)	Primary	Permanent	500	1.1	807	500

1 = Bryant Wells No. 1 and No. 2 are authorized by the same water right. Quantities shown are for the entire right, not each individual well.
2 = The change application for Cedarhome Well was approved for 500 gpm; however, the Sill Well water right was 600 gpm. Ecology agreed to approve the transfer of 600 gpm provided that it could be shown that the withdrawal of 600 gpm would not cause seawater intrusion. The City is working on developing this information for Ecology's review.

Sources of water derive from recharge of precipitation into aquifers that discharge to City-owned wells and springs. The groundwater recharge does not appear to be restricted by growth in the aquifer recharge areas for these sources. Groundwater recharge to the City's sources of supply occurs within the Stillaguamish River watershed (WRIA 5) and these sources are beneficially used within WRIA 5.

The sources of supply are not located in any of the 16 fish-critical basins established by the Department of Ecology. The City water rights are senior to instream flow rule and not subject to limitation by stream flow in the Stillaguamish River or its tributaries. The Stillaguamish River Watershed Chinook Salmon Recovery plan has identified increasing stream flow as a goal to improve habitat conditions for Chinook salmon, a species designated under the Endangered Species Act as Threatened in the Stillaguamish basin. However, stream flow in the tidally-influenced portion of the Stillaguamish River is not considered a limiting factor in salmon recovery planning.

Environmental factors such as drought or climate change are not likely to affect recharge to the sources. Groundwater levels fluctuate seasonally but recover each spring to previous year levels. Some general declines in water levels during pumping are attributed to well inefficiency, which will be addressed within the 6-year planning period as part of the WSP CIP to rehabilitate existing wells or replace supply wells in the same body of groundwater.

WATER USE EFFICIENCY PROGRAM

As previously described, the fundamental elements of a WUE program include planning requirements and DSL standards, as well as goal setting and performance reporting. The City's water use data, demand forecasts and other planning requirements are contained in **Chapter 4** of the WSP. The City is committed to continue collecting water use data beyond that presented in **Chapter 4** for evaluation of its WUE program and water use patterns, and for forecasting demands for future facilities. The City's WUE program that follows includes a statement of its goals and objectives, the evaluation and selection of alternative efficiency measures, the schedule and budget, and the method of program monitoring.

Water Use Efficiency Goals and the Public Process

Per WAC 246-290-830, WUE goals must be set through a public process and shall be evaluated and reestablished a minimum of every six years. In compliance with the new WUE Rule, a public hearing was held on January 24, 2008 to present and discuss goals. Background on the City's proposed WUE program, water supply characteristics, water demand forecasts and other elements were made available two weeks prior to the public forum date. All comments received at the forum were reviewed and considered by the City. The City's current WUE goals were adopted by the City at a regularly scheduled City Council meeting on February 3, 2008. In the future, WUE goals will be evaluated and reestablished during the water system planning process, or at minimum of every six years.

Based on the successful implementation of the current WUE program, the City has achieved one of the goals adopted in 2008 and has saved approximately 165 million gallons of water over the previous 6 years. New goals have been proposed based on the demand analysis and projections presented in the City's *Comprehensive Water System Plan* (WSP). It is anticipated that the proposed goals will be adopted along with the WSP at a regularly scheduled City Council meeting. Prior to adoption of the goals, a public notice will be posted at least two weeks before a City Council meeting public forum for presenting and considering public comments.

The proposed goals and objectives of the City's WUE program consist of:

- Reduce the 4-year rolling average demand per equivalent residential unit (ERU) by 5 percent by 2019 and by 8 percent by 2029. This represents an average demand per ERU of 201 gallons per day by 2019 and 195 gallons per day by 2029; and
- Maintain distribution system leakage at 10 percent or less through 2029.

The City will achieve these goals and objectives through the implementation of the WUE program that follows. Reducing DSL is a supply side goal that can be achieved through measures that will mainly be carried out by the City's Water Department or in coordination with other City departments. Reducing the demand per ERU is a demand side goal that can be achieved through carrying out measures that affect customers' water use.

Evaluation and Selection of Water Use Efficiency Measures

The City's evaluation of WUE measures and selected levels of implementation are presented within this section. The measures fall within three categories of implementation: 1) mandatory measures that must be implemented; 2) measures that must be evaluated; and 3) additional measures selected by the City that must be either evaluated or implemented.

The City served 3,051 water service connections in 2009. Based on the number of connections, at least six WUE measures must be evaluated or implemented. Measures that are mandatory cannot be credited towards the system's WUE measures. Since the City implements the minimum number of required measures, a cost-effective evaluation is not required.

Mandatory Measures

Source Meters

The volume of water produced by the system's sources must be measured using a source meter or other meter installed upstream of the distribution system. Source meters are currently installed and operating at each of the City's sources. If any new sources are installed in the future, they will be equipped with a source meter.

Service Meters

All public water systems that supply water for municipal purposes must install individual service meters for all water users. Service meters are currently installed and operating at all connections throughout the distribution system. All future connections that are installed or activated will be equipped with a service meter.

Meter Calibration

The City must calibrate and maintain meters based on generally accepted industry standards and manufacturer information. Compliance will be maintained by the City by performing maintenance on the source and service meters every five to ten years at a minimum. Meter calibration is performed on an as-needed basis, typically when meter readings are inconsistent with customer consumption history.

Water Loss Control Action Plan

To control leakage, systems that do not meet the DSL standard must implement a Water Loss Control Action Plan (WLCAP). The City's rolling 3-year average DSL was 10 percent in 2009; however, total distribution system leakage in 2009 alone was only 8.6 percent. The City has increased recordkeeping and estimating of authorized water consumption uses such as construction, flushing and fire fighting activities to reduce the amount of DSL in the system. The City will also conduct a system-wide leak detection survey in 2010, 2011 and 2012 to identify leaking water mains. It is anticipated that the 2009 DSL of 8.6 percent can be maintained through new record keeping practices and the completion of the leak detection survey in 2012.

Customer Education

Annual customer education regarding the importance of using water efficiently is a required element of all WUE programs. Customer education is provided in the City's annual Consumer Confidence Report (CCR) to customers and includes information on the system's DSL, progress towards meeting WUE goals and tips for customers on using water more efficiently.

Measures That Must Be Evaluated

Rate Structure

A rate structure that encourages WUE and provides economic incentives to conserve water must be evaluated, but is not required to be implemented. The City's current utility rates are designed to discourage excessive water use. The uniform block rate structure imposes a unit charge for water use above the base amount allowed for each meter size. For ¾-inch meters that typically serve single family residences, customers that use over 600 cubic feet in one billing cycle are billed an additional $2.31 for every 100 cubic feet of water consumed in excess of 600 cubic feet.

The City will be conducting a water rate study in 2010 and will consider alternative rate structures that will further encourage WUE. The water rate study will evaluate an inclining block rate structure that imposes an increased unit charge with higher water use above the base amount allowed. The rate study will also evaluate seasonal rates to reduce peak summer water use.

Reclamation Opportunities

The City has evaluated reclamation opportunities but has determined that reuse opportunities will not be beneficial because the cost to construct improvements to the existing wastewater treatment plant and separate conveyance systems is much more than the financial savings resulting from the potential water savings.

The City's wastewater treatment plant does not treat wastewater to a level that can be used for reclaimed purposes. Significant upgrades to the wastewater treatment plant and the installation of purple pipe would be necessary to provide reclaimed water to customers. The City's highest water users consist of businesses such as food processing and packing plants, a nursing facility and a grocery store that rely on potable water and likely would not purchase reclaimed water. Customers that could utilize reclaimed water include large irrigators such as parks, schools and cemeteries. A car wash facility is also located near the wastewater treatment plant and could utilize reclaimed water if available.

The City's 2009 *Comprehensive Sewer System Plan* recommends a Headworks Study and Loading Analysis to be completed in 2014. The study will consider improvements to enable the wastewater treatment plant to produce reclaimed water when the treatment capacity is expanded. Improvements to the wastewater treatment plants are scheduled beyond 2022 in the *2009 Comprehensive Sewer System Plan*.

Selected measures

The City has chosen to implement three different WUE measures in addition to those that are mandatory or required to be evaluated. Each of the chosen measures will be implemented for all three customer classes. The City's WUE program, therefore, counts as nine WUE measures, which exceeds the requirement of six WUE measures based on the number of service connections.

Customer Education

Customer education that is carried out more than once a year counts towards meeting the program requirements for WUE measures. The City will provide periodic customer education, in addition to the annual CCR, through school outreach activities, brochures in water bills and support of regional educational programs. Since this measure will be implemented for all customer classes, it counts as three WUE measures for the City's program.

Indoor Conservation Kits

The City will offer free indoor conservation kits to all customers. These kits may include high efficiency showerheads, faucet aerators, toilet tank water displacement bags, leak detection dye tablets for toilets and informational brochures. Additional advertising efforts will be made to promote the availability of these kits, which include placing notices in utility bills, links on the City website and displaying the kits at public events. Since this measure will be implemented for all customer classes, it counts as three WUE measures for the City's program.

Outdoor Conservation Kits

The City will offer free outdoor conservation kits to all customers. These kits could include a garden hose nozzle, an automatic shut-off for manual lawn and garden sprinklers, rain gauge and leaky hose repair kit. Additional advertising efforts will be made to promote the availability of these kits which include placing notices in utility bills, links on the City website and displaying the kits at public events. Since this measure will be implemented for all customer classes, it counts as three WUE measures for the City's program.

Water Bill Showing Consumption History

The City is currently updating its utility billing system. Once complete, the City will evaluate the ability to add consumption history charts and information on water bills. If implemented, this will count as three additional WUE measures for the City's program.

Water Use Efficiency Program Schedule and Budget

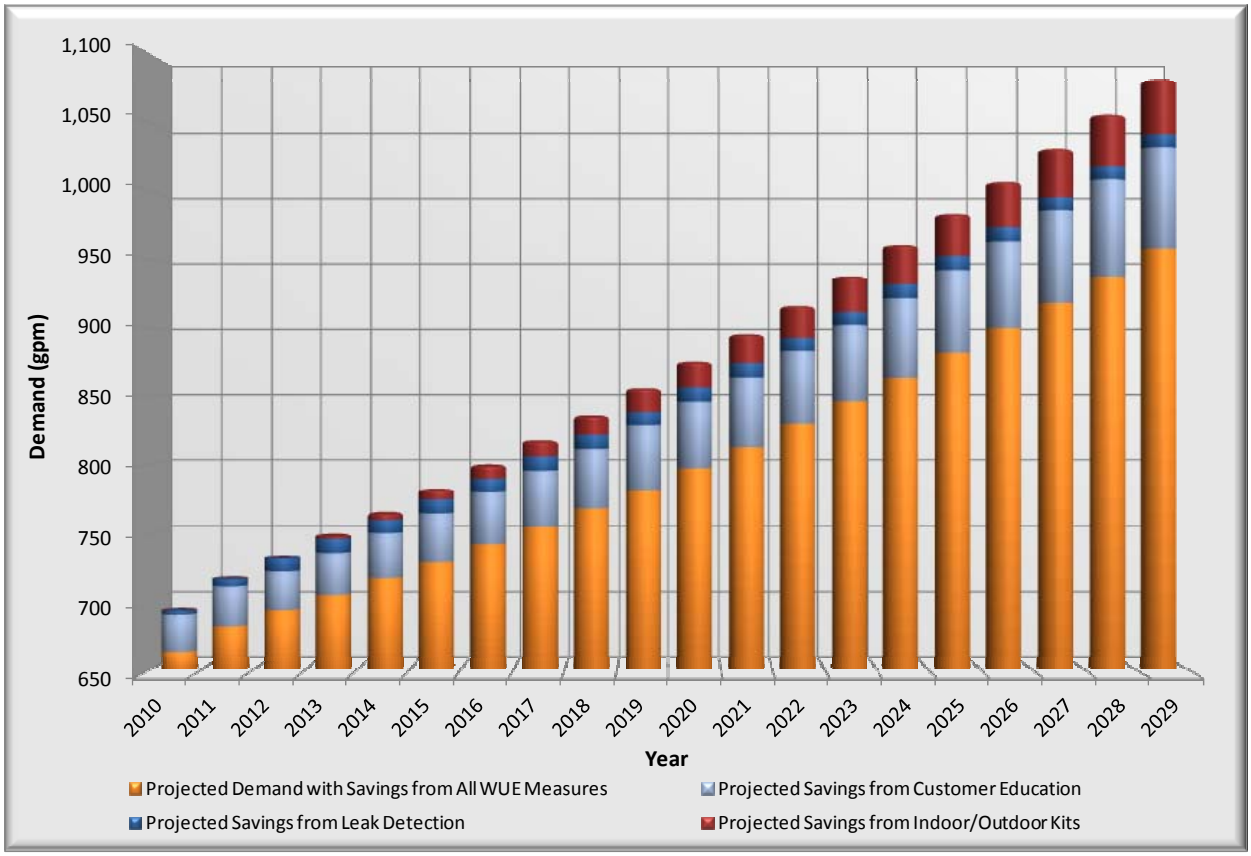
The WUE measures described above and selected for implementation by the City are summarized in **Table 3** with their corresponding schedule and budget. The successful implementation of this program is expected to achieve a 5 percent water use reduction by the year 2019 and an 8 percent water use reduction by the year 2029, as shown in **Chart 1**.

Table 3
WUE Program Schedule and Budget

Water Use Efficiency Measure	Schedule	Budget
Mandatory Measures		
Source Meters	Ongoing	O&M Funded
Service Meters	Ongoing	O&M Funded
Meter Calibration	Ongoing	O&M Funded
Water Loss Control Action Plan/Leak Detection	2010-2012	$6,000/yr
Customer Education - Annual Consumer Confidence Report	Ongoing	$500/yr
Measures That Must be Evaluated		
Rate Structure[1]	2010	$40,000
Reclamation Opportunities	2014/2022	Sewer CIP Funded
Selected Measures		
Customer Education - School Outreach, Brochures, etc.	Ongoing	$1,000/yr
Indoor Conservation Kits	2013-2029	$2,000/yr
Outdoor Conservation Kits	2013-2029	$1,500/yr
Water Bill Showing Consumption History	Not Determined at this Time	

1 = Rate structure budget reflects water rate study cost.

Chart 1
WUE Program Projected Water Savings



Water Use Efficiency Program Evaluation and Reporting

The City will continue to evaluate overall demand, per capita and per ERU water use, and the amount of DSL on an annual basis. The City will evaluate the performance of its WUE program and implemented measures by analyzing demand data and determining the long-term trend towards reducing water usage per ERU and meeting WUE goals. If the program monitoring shows that progress towards meeting the WUE goals is not being accomplished, more rigorous program implementation or additional program items will be considered, along with a cost-effective evaluation of measures.

The City will continue to provide annual WUE performance reports to its consumers in the Consumer Confidence Report, and will detail the results of water use monitoring and progress towards achieving the system's WUE goals. A copy of the City's 2009 CCR is included in **Appendix L** of the City's WSP.