



**Water System Plan
Cross Valley Water District**

**Appendix F
WUE and Public Education**

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Chapter 5. Water Use Efficiency Program

5.1 Introduction

This chapter has four purposes:

1. Review compliance with conservation planning requirements.
2. Describe historical conservation measures.
3. Document historical conservation savings.
4. Describe the water use efficiency (WUE) program that will be implemented in the Everett Water Service Area (EWSA) from 2020 through 2029.

Everett has a long-standing commitment to water conservation. Everett's conservation program began in the early 1980s and has evolved significantly since then.

Everett administers both a regional conservation program implemented throughout the EWSA, as well as conservation elements that pertain exclusively to the Everett retail service area. The goal of these conservation efforts is to maximize benefits of the Sultan River resource by encouraging efficient use of water.

The conservation program was expanded as part of the *2000 CWP*, when a rigorous least-cost analysis was conducted. A committee of Everett staff and wholesale water customers evaluated over 20 potential demand-side measures that could be implemented regionally. Based on cost-effectiveness, market potential, consumer acceptance and other criteria, additional elements were added to the program that significantly strengthened the conservation effort. Similar analyses were repeated during the development of the *2007 CWP* and the *2014 Addendum to the 2007 CWP*.

As part of the *2020 CWP*, a progressive conservation program for the next 10 years has been developed through a collaborative process involving Everett staff, wholesale water customers, and the Everett City Council. This program builds on the success of the previous conservation efforts and focuses on activities that meet or exceed Washington State's WUE program requirements, while dedicating a level of investment that is in line with the economic abilities of the water system.

5.2 Objectives/Goals

Everett enjoys an abundance of water with a delivery system that is capable of meeting the near-term water demand in the EWSA with relatively modest capital improvements. Although there is little financial motivation for conducting an aggressive water conservation program, the City and its wholesale customers support stewardship of regional water resources, and also must comply with State WUE requirements. This includes providing financial support for activities that promote water conservation and assisting consumers with installing measures that increase end-use water efficiency which demonstrate the City's support of these objectives. The goal of the 2020-2029 regional water conservation program is to reduce the regional demand for water, based on typical current consumption volumes, by approximately 1.4 MGD on an annual basis by the end of 2029.

5.3 Compliance with Water Use Efficiency Planning Requirements

As part of the 2003 Municipal Water Law, the Washington State Legislature directed the DOH to adopt an enforceable WUE program. This program became effective January 2007 and is administered by the Office of Drinking Water. The WUE program is intended to achieve a consistently high level of stewardship by incorporating water use efficiency into the water system planning process. The specific requirements are found in WAC 246-290, the Third Edition of the Water Use Efficiency Guidebook (DOH 331-375), and the DOH Water System Planning Handbook (update pending). To summarize, municipal water suppliers must:

- Publicly establish water savings goals.
- Evaluate or implement water-saving measures to achieve the goals.
- Develop and implement a WUE program to support the established goals.
- Report annually on the progress towards achieving the goals.
- Achieve a standard of no more than 10 percent water loss.

The requirements are intended to support the goal of ensuring safe and reliable drinking water by contributing to long-term water system reliability and public health protection, promoting good stewardship of water resources and ensuring the efficient operation and management of water systems.

There are seven main categories of WUE requirements:

1. water meters
2. data collection
3. demand forecasting
4. WUE program
5. distribution system leakage
6. goal setting and public forum
7. annual WUE reporting

Everett has been in, and remains in, compliance with the WUE requirements, with the exception of metering all service connections. Everett is actively installing meters on non-metered service connections and plans to complete the program by July 2021.

The remainder of this chapter addresses category 4, the WUE program, which has nine requirements:

1. Describe the WUE program
2. Estimate water savings
3. Identify goals
4. Evaluate conservation measures

5. Describe the next 10-year conservation program
6. Educate customers
7. Project water savings from measures
8. Evaluate program effectiveness
9. Estimate system leakage (Chapter 3)
10. Evaluate reclaimed water opportunities (Chapter 2)
11. Evaluate rate structure (Chapter 10)

5.4 Historical WUE Programs

The conservation measures evaluation conducted for the 2014 Comprehensive Water Plan resulted in the implementation of a number of measures, summarized in Table 5-1. For each measure, the table indicates the years implemented and whether the measure included Everett's wholesale customers. The details of measure implementation between 2014 and 2019 are discussed in the subsequent sections.

Table 5-1. 2014 - 2019 WUE Program Overview

Measure	Years Implemented						Included Wholesale Customers?
	2014	2015	2016	2017	2018	2019	
Public Education							
School Outreach	X	X	X	X	X	X	Yes
Speakers Bureau	X	X	X	X	X	X	No
Program Promotion	X	X	X	X	X	X	Yes
Theme Shows & Fairs	X	X	X	X	X	X	No
Incentives/Measures							
Indoor Kits							
Showerheads	X	X	X	X	X	X	Yes
Bathroom Faucet Aerators	X	X	X	X	X	X	Yes
Kitchen Faucet Aerators	X	X	X	X	X	X	Yes
Toilet Leak Detection Strips	X	X	X	X	X	X	Yes
Outdoor Kits and Watering Timers	X	X	X	X	X	X	Yes
ICI Audits			X	X	X		Yes
Miscellaneous ^a	X	X	X	X	X	X	Yes

^a This category refers to costs that do not fit in any other category. Expenditures in this category were \$2,500 each year.

5.4.1 WUE Program Measures (2014 – Present)

Public Education

This measure includes education programs targeted to increase awareness of local water resources and encourage water conservation practices.

School Outreach

Everett's school outreach program consists of classroom presentations, teacher workshops, and classroom educational materials, all of which are made available throughout the EWSA.

Everett's classroom presentations are facilitated by trained instructors with curriculum designed for elementary, middle, and high school students. The presentations are marketed to teachers through newsletters and other communications. The presentations were redesigned in recent years to keep content fresh and relevant. This has resulted in a significant increase in the number of presentations.

Everett has offered teacher workshops to assist teachers in educating students about water resource issues, including conservation. Teachers participate in activities, experiments, and field trips and can receive continuing education credits or clock hours.

Everett provides teachers with a broad collection of classroom educational materials pertaining to water use efficiency including books, videos, posters, and other supplies.

Speakers Bureau

Everett provides staff to groups requesting presentations on water resource issues, including conservation. Everett offers this service exclusively in its retail service area.

Program Promotion

Everett publicizes the need for water conservation through television and radio public service announcements, news articles, public water system bill inserts, and other means.

In addition to program-specific outreach, Everett engages in general program promotion intended to build and reinforce a water conservation ethic among customers throughout the EWSA.

Everett has developed and distributes several educational brochures. For example, the "Everyday Conservation" brochure provides conservation tips for inside and outside the home, the "Smart Watering" brochure contains information on efficient lawn and garden watering techniques, and the "Growing Healthy Soil" brochure has information on how soil can be improved as a means to reduce watering.

Everett develops and distributes approximately 150,000 summer watering calendars each year in the EWSA that encourages residential customers to water every third day (staggered, based on their street address). This effort can help to reduce the daily peak demand for water in the summer by reducing the amount of watering that occurs on a given day.

In terms of marketing efforts, Everett has used transit advertising to help convey conservation messaging. Billboards promoting various conservation themes have been posted on buses during the summer months when demand peaks. It is estimated these billboards are seen by over 75 percent of the residents of the EWSA each year. Since 2003, Everett has also participated in tri-county (Snohomish, King, and Pierce) water conservation marketing campaigns which included radio and/or television messages.

Theme Shows and Fairs

Everett exhibits displays, along with other education materials, at a variety of special events within its retail service area.

INDOOR KITS

Indoor kits contain easily installed water saving devices for single-family residential homes. Owners and managers of apartment buildings and condominiums can also receive indoor kits.

Everett has offered free indoor water conservation kits to residential customers throughout the EWSA since 2001. The kits are marketed through advertisements in local newspapers and bill inserts. From 2001 to 2003, the indoor kits were only distributed to Class A water systems in the EWSA due to the limited number of the kits. Since 2004, the kits have also been distributed to Class B systems.

This measure applies to the single family and multifamily sectors. It is assumed that 75 percent of customers targeted are single family, and 25 percent are multifamily. Indoor kits are free to customers and currently include 1.75 gpm showerheads, 1.0 gpm bathroom faucet aerators, a brochure and thread seal tape. Additionally, 1.5 gpm kitchen faucet aerators and toilet leak detection dye strips are offered separate from the packaged indoor kits. The showerheads, bathroom faucet aerators, and kitchen faucet aerators are more efficient than the maximum allowed under the plumbing code. As such, indoor kits are distributed to both existing and new customers.

Outdoor Kits

Since 2001, Everett has offered free outdoor conservation kits to residential customers throughout the EWSA. This measure applies to the single family sector, both existing and new customers. Outdoor kits are designed to encourage consumers to reduce watering and other outdoor water use. The free outdoor irrigation kits include devices and information to improve the irrigation efficiency of residential customers that manually irrigate their landscaping (e.g. spring-loaded hose nozzle, rain gauge, hose washers, conservation brochure). Most recently, the outdoor kits consisted of three items that can be distributed in any combination based on individual customer need, to reduce the possibility of parts not being used. These include a hose nozzle, a moisture meter, and a watering timer with shut-off device.

Industrial/Commercial/Institutional Indoor and Outdoor Audits

This measure provides free indoor and outdoor audits to large volume industrial, commercial, and institutional (ICI) customers to determine efficiencies that could be achieved through hardware improvements, operational changes, or irrigation efficiency improvements. This measure targets ICI customers who consume several million gallons of water each year. There is no exact volume of water that denotes a "large volume ICI customer," and a customer's eligibility for this measure is determined at Everett's discretion. The audits are performed by a contracted professional auditor.

Other Incentives and Miscellaneous Measures

This measure allows for special water conservation projects and/or possible incentives for the large customer audit program. Opportunities to adopt other incentives and miscellaneous measures are evaluated on an individual basis and with respect to the available funds over the program period.

5.5 Historical Conservation Savings

The conservation savings Everett achieved between 2014 and 2019 are shown in Table 5-2. As of the end of 2019, it was estimated that these measures collectively saved about 1.08 MGD over the six year period. These numbers were compiled by Everett staff based on conservation program planning and empirical data. Additionally, savings related to the plumbing code requirements continued over this period as older, fixtures were replaced at the end of their useful lives by more efficient models. These savings are considered incidental to the water use efficiency program, and are not reflected in the 1.08 MGD total listed in the table.

Table 5-2. Estimated Savings From 2014-2019 (MGD)

Measure	2014	2015	2016	2017	2018	2019	Total
Education	0.60	0.60	0.60	0.60	0.60	0.60	0.60
Indoor Kits	0.02	0.05	0.04	0.04	0.06	0.04	0.25
Outdoor Kits	0.02	0.02	0.02	0.02	0.03	0.03	0.14
ICI Audits	-	-	0.04	0.05	0.00	-	0.09
Miscellaneous ^a	-	-	-	-	-	-	-
Totals	0.64	0.67	0.70	0.71	0.69	0.67	1.08
Cumulative Totals	-	0.71	0.81	0.92	1.01	1.08	

^a No direct savings attributed to the "Miscellaneous" category but remains in the table since costs were incurred under the category.

5.6 Water Use Efficiency Program for 2020 – 2029

A water use efficiency program for Everett for the next 10 years was developed based on an evaluation of various measures and analyses of associated costs and water savings. The following sections describe the analyses which informed development of the 2020-2029 water use efficiency program. A summary of the program is presented in Section 5.6.3.

5.6.1 Avoided Cost of Supply Analysis

When water is saved through efficiency and conservation, certain costs associated with the water and wastewater systems are avoided. These can include operational costs such as chemical costs associated with water and wastewater treatment, energy costs associated with pumping drinking water and wastewater, as well as capital costs associated with expanding the capacity of facilities to convey higher volumes of water or wastewater. Collectively these are termed "avoided costs of supply." Conservation measures where the cost of implementation is below the avoided cost of supply are considered cost-effective.

The total potential avoided cost of supply due to conservation is \$0.41 per ccf. This represents the potential savings Everett could realize for each unit of water not supplied if water use efficiency and conservation efforts result in avoided capital projects and operational expenses. A technical memorandum detailing the information gathered, the analysis methodology, and the results of the avoided cost of supply analysis is included in Appendix K.

5.6.2 Conservation Measure Analysis

An analysis of several measures was conducted to include updated demographic information and revise savings estimates of measures previously employed in the conservation program. The

analysis included consideration of demographics, participation rates, estimated water savings, and implementation costs. The analysis included 16 measures, applied to the single family, multifamily, and ICI sectors as appropriate, shown in Table 5-3. All conservation measures in the current program were reanalyzed (except education, which is not analyzed in the model). Note that this was not an exhaustive analysis of all potential measures, but rather a focused analysis of measures considered applicable to Everett and its wholesale customers.

Table 5-3. Conservation Measures Analyzed

Measure	Single Family	Multifamily	ICI
Toilets - leak detection	X	X	X
Showerheads – 1.75 gpm	X	X	
Showerheads – 1.5 gpm	X	X	
Faucet aerators bathroom - 1.0 gpm	X	X	
Faucet aerators bathroom - 0.5 gpm			X
Faucet aerators kitchen – 1.5 gpm	X	X	
Clothes washers - residential capacity (in common areas)			X
Clothes washers - commercial capacity (in Laundromat)			X
Outdoor Irrigation Kits	X	X	
Combined Indoor and Outdoor Audit			X
Irrigation Systems - school audits only			X

The measures were analyzed for both the 10-year and 20-year planning periods associated with this CWP. A summary of the results for the 10-year planning period, which is most applicable to Everett's conservation program for 2020-2029, is shown in Table 5-4. A technical memorandum discussing data inputs, measure definitions, analysis methodology, assumptions, and detailed results for both the 10-year and 20-year planning periods is included in Appendix L.

Table 5-4. Summary of Conservation Measure Analysis for the 10-Year Planning Period

Conservation Measure		Savings Generating Customers	Annual Average GPD at Full Implementation	CCF Over Measure Life	Total Cost Over Plan Period	Direct Costs	
						Cost per CCF Saved Over Measure Life	Cost per CCF Saved Over Measure Life
Single Family	Toilets - leak detection	6,148	111,894	496,864	\$9,594	\$0.02	\$0.02
	Showerheads - 1.75 gpm	7,546	45,276	220,925	\$86,140	\$0.39	\$0.39
	Showerheads - 1.5 gpm	4,611	37,810	175,277	\$57,500	\$0.33	\$0.33
	Faucet aerators bathroom - 1.0 gpm	8,384	51,981	253,634	\$16,770	\$0.07	\$0.07
	Faucet aerators kitchen - 1.5 gpm	8,384	34,386	167,782	\$55,890	\$0.33	\$0.33
	Outdoor Irrigation Kits	3,029	2,312	10,264	\$52,806	\$5.14	\$5.14
	Toilets - leak detection	6,905	94,608	420,107	\$7,176	\$0.02	\$0.02
	Showerheads - 1.75 gpm	9,854	44,356	216,451	\$57,720	\$0.27	\$0.27
	Showerheads - 1.5 gpm	5,179	31,599	146,476	\$31,230	\$0.21	\$0.21
	Faucet aerators bathroom - 1.0 gpm	9,351	43,963	214,523	\$18,700	\$0.09	\$0.09
Multi-family	Faucet aerators kitchen - 1.5 gpm	9,351	29,001	141,515	\$62,340	\$0.44	\$0.44
	Clothes washers - residential capacity (in common area)	1,324	13,374	76,356	\$28,470	\$0.37	\$0.37
	Outdoor Irrigation Kits	927	161	713	\$19,994	\$28.04	\$28.04
	Toilets - leak detection	181	40,725	180,840	\$4,459	\$0.02	\$0.02
	Faucet aerators bathroom - 0.5 gpm	1,526	67,754	297,607	\$10,680	\$0.04	\$0.04
Commercial	Clothes washers - commercial capacity (in Laundry)	4	5,376	30,693	\$6,910	\$0.23	\$0.23
	Combined Indoor and Outdoor Audit ¹	3	46,554	113,582	\$10,650	\$0.09	\$0.09
	Irrigation Systems - school audits only	7	2,449	11,524	\$6,750	\$0.59	\$0.59

5.6.3 2020 – 2029 Conservation Program

The conservation program for 2020 – 2029 was developed using detailed conservation measure analyses along with other considerations such as conservation drivers, budgetary constraints, and success of prior programs. It will continue the efforts of the prior program with minor changes as described in the measure descriptions below. The general premise in establishing the program was to select a suite of measures that would: 1) provide assistance to all water use sectors, 2) select measures with implementation costs that are within a reasonable range of Everett's avoided cost of supply, 3) have annual budgets similar to current conservation program expenditures, and 4) contain at least the minimum number of required measure under the WUE rule.

The conservation program for 2020 – 2029 consists of the following five categories:

Education

Measures in this category are a continuation of the EWUC's current educational efforts described in Section 5.4.1. The savings associated with education measures are estimated to be approximately one percent of the forecasted demand without conservation for each year. Note that the savings in this category are not cumulative over the ten-year period since a continuous effort must be made in order to maintain the savings each year. The budget for education is based on prior program costs, with a modest increase due to inflation and other increased costs.

Indoor Measures

Measures in this category apply to the single family and multifamily sectors. It is assumed that 75 percent of customers targeted are single family, and 25 percent are multifamily. Indoor measures are free to the customer and include 1.75 gpm showerheads, 1.0 gpm bathroom faucet aerators, a brochure and thread seal tape. Additionally, 1.5 gpm kitchen faucet aerators and toilet lead detection dye strips are offered separate from the packaged indoor kits. The showerheads, bathroom faucet aerators, and kitchen faucet aerators are more efficient than the maximum allowed under the plumbing code. As such, indoor measures will be distributed to both existing and new customers.

The conservation measure analysis noted that leak detection and repair is the most significant indoor conservation measure in terms of both savings and cost effectiveness. Therefore, Everett will place greater emphasis on providing information to customer regarding toilet leaks in the 2020-2029 program.

Outdoor Measures

This measure category applies to the single-family sector, both existing and new customers. These are free outdoor irrigation fixtures with devices and information to improve the irrigation efficiency of residential customers that manually irrigate their landscaping. The kits typically include a spring-loaded hose nozzle. Moisture meters and watering timers are also made available. Watering guides and conservation brochures are offered online and at the utility counter during spring and summer months to distribute to customers along with the devices.

ICI Indoor and Outdoor Audits

This measure provides free indoor and outdoor audits to large ICI customers to determine water use efficiency that could be achieved through hardware improvements, operational changes, or irrigation efficiency improvements. This measure targets large water users as defined in the ICI audit description in Section 5.4.1. The audits will be performed by a professional auditor contracted with Everett.

Other Incentives and Miscellaneous Measures

This category allows for special water conservation projects and/or incentives for the high-volume water use customers. Other incentives and miscellaneous measure opportunities which may arise over the next 10 years can be evaluated for implementation on an individual basis and with respect to available program funds.

Summary of 2020 – 2029 Program

The estimated number of units (e.g. fixtures, devices, audits), annual program budget, and estimated water savings for the 2020 – 2029 conservation program are summarized in Table 5-5. This table represents the overall planning goals for the conservation program. Approximately \$226,000 per year will be budgeted for regional water conservation activities. However, annual budgets and units distributed to customers may vary year to year.

Table 5-5. Annual and Total Budget and Estimated Savings for the 2020-2029 Water Use Efficiency Program

Measures	Annual			Program Totals		
	Units	Budget	Savings (MGD)	Units	Budget	MGD Saved
Education	-	\$165,000	0.60	-	\$1,650,000	0.60
Indoor Measures	3,000	\$32,000	0.06	30,000	\$320,000	0.60
Outdoor Measures	4,000	\$40,000	0.02	40,000	\$400,000	0.20
ICI Audits	2	\$6,000	0.04	20	\$60,000	0.40
Miscellaneous	-	\$25,000	-	-	\$250,000	-
Totals	-	\$268,000	0.72	-	\$2,680,000	2.0