CHAPTER 4
WATER CONSERVATION AND REUSE

4.1 INTRODUCTION

Cross Valley Water District (the District) recognizes that water conservation is a critical component of water supply planning. Under the Municipal Water Law (MWL) enacted in 2003, the District and other large public water providers in the State of Washington were required to place greater emphasis on ensuring efficient use of water, per Department of Ecology (DOE) determinations of beneficial use, in exchange for certainty of water rights and greater flexibility to plan for future demand. On January 22, 2007, the Water Use Efficiency (WUE) rule became effective, directing DOE to adopt and enforce a regulatory WUE program.

In the development of its WUE Program, the District evaluated nine conservation measures for cost effectiveness, though only required to evaluate six. This proactive approach to WUE is congruous with the District's longstanding support for the goals of regional water conservation and commitment to promoting efficient use through reductions in average household/business water consumption within its boundaries.

Water reuse is under consideration throughout the regional wastewater treatment service area of the King County Wastewater Treatment Division. Opened in 2011, Cross Valley houses the Brightwater regional treatment plant in the Maltby industrial area, located within the District's southwest service area. The District remains open to potential partnerships and opportunities for water reuse within its service area and was designated in December of 2005 as the purveyor of any reclaimed water within Cross Valley service area through a mitigation agreement with the County. The District recognizes that actual use of reclaimed water will require careful coordination of specific environmental conditions and customer needs in terms of quality, quantity, and price.

4.2 WATER CONSERVATION HISTORY

In the early 1990's, the District implemented a water conservation program which used the Conversation Planning Requirements. The core of the Cross Valley Water District's Conservation Plan falls into four categories:

- Public Education
- Technical Assistance and Administration
- Metering Policy
- Other Incentives / Measures

4.2.1 Public Education

Historically, the District has provided numerous public education services for its customers related to water conservation and stewardship. Currently, water conservation related public education programs are provided within the District's service area by the City of Everett, a utility partner. The District also maintains individuals on staff who are versed in water conservation, should any schools or organizations wish to promote water education. Additionally, conservation related information is provided on the District's website and informational notices are sometimes included on the billing statements sent to customers.

Cross Valley recognizes the importance in displaying both current and historical water usages on the water bills sent to customers, as this enables customers to track their own conservation and WUE efforts and to identify irregularities. In addition, reaching out to high water users to inform them of choices concerning WUE has been common practice for District staff.

4.2.2 Technical Assistance and Administration

Offering technical assistance to customers and administering system wide measures has been at the core of the District's Conservation Plan since the 1990s. The Conservation Plan over the past thirty years has included the following activities:

- A low-flow showerhead and faucet aerator exchange.
- Outdoor hose nozzle and water timer
- Targeting large water users for commercial and residential water audits (for internal water consumption) offered through the City of Everett, when available.
- Irrigation audits for golf courses and residences (external consumption) offered through the City of Everett, when available.

Newly added to the conservation efforts:

- An option for Beacon software allowing customers to open accounts, sign up for leak alerts, and view/track their own conservation goal.

4.2.3 Metering Policy

The District maintains a policy requiring meters on all sources, interties, and customer connections. Customers with new irrigation systems are also offered the opportunity to install separate meters as a conservation measure.

4.2.4 Other Incentives / Measures

The following items fall under the Other Incentives / Measures category:

- The District's office maintains water wise landscaping which provides customers with an educational example of how landscapes may be designed to maximize water efficiency, minimize excessive watering during peak summer months, and promote healthy soils.

- The District provides lawn watering schedules both in fliers and on the District website.
- The District has had tremendous success in distributing water conservation kits, achieved by publicizing the availability of the kits. Both indoor and outdoor kits are made available, as well as toilet leak detection strips.
- In January 1, 1993, a tiered rate structure (conservation pricing) was implemented to encourage conservation. Rates are reviewed periodically and adjusted as necessary. Conservation pricing and the break points in the block structure are considered in these adjustments.

Previous Incentives / Measures:

- The high efficiency appliance rebate program, though no longer offered, 17 Cross Valley customers were issued rebates.

4.3 Water Use Efficiency (WUE) Goal

Table 4-1 summarizes the requirements established under the MWL's Rule on Water Use Efficiency and provides a status on the District's progress towards meeting the requirements.

Table 4-1: Water Use Efficiency Requirements – Medium-Sized Water Systems

Component (WAC #)	Requirements	District Status/Recommendations
Data Collection (246-290-100)	Provide monthly and annual water production totals for all sources, including quantities purchased from and/or supplied to other purveyors. Provide Annual usage totals for each customer class and a description of the "seasonal variations" in consumption patterns of each customer class. Consider water use efficiency rate structures.	Cross Valley records water consumption and production data as required, including annual and monthly production totals, consumption totals by customer class, and seasonal variations of consumption totals by customer class. The District currently maintains a conservation pricing scheme discussed in Section 4.2.4. The District receives water use reports from associated fire departments and maintains a system for tracking water used in district operations, fire-fighting, and other types of authorized consumption. A copy of the District's Water Reclamation Checklist is provided in Appendix E.

Component (WAC #)	Requirements	District Status/Recommendations
Demand Forecasting (246-290-100)	Provide demand forecasts for District with and without conservation measures for the plan approval period and at least twenty-year planning period. Demand forecasts shall be developed per WAC 246-290-221. Describe forecasted savings from efficiency program, including all cost effective measures evaluated.	Water demand forecasts, with and without conservation measures, is discussed in Section 2.6.3 of this Plan. Demand forecasting methodology is compliant with WAC 246-290-221 standards. The District records estimated savings resulting from the WUE Program and has calculated forecasted savings from proposed WUE measures, discussed in Section 4 of this plan.
Metering (246-290-496)	All water sources and service connections must be metered. If not currently fully metered, District must implement a plan for full installation. Consumption: Meters must be installed on all new service connections when the connection is activated. Production: The volume of water produced or purchased must be measured using a meter installed upstream of the distribution system. Meters must be installed on all interties used as permanent or seasonal sources Meters must be selected, installed, operated, calibrated, and maintained following generally accepted industry standards and information from the manufacturer.	Cross Valley meters all new direct service connections and has meters on all existing sources, interties, and customer connections. In 2016 the District began installing remote reading equipment on all of its meters, which was completed in 2019. "Smart metering" is offered to customers through use of Beacon software, which offers access to hourly water use data, promoting leak detection and providing customers with tools to manage water use. Water production is measured using meters installed upstream of the distribution system. Meters are installed in all interties used as permanent or seasonal sources. The District's meter installation, calibration, and maintenance practices follow general industry standards. All meters purchased by the District, come pre-calibrated, and meet AWWA standard.
Efficiency Program (246-290-810)	Proposed WUE (Water Use Efficiency) program to include the following:	The WUE Program adopted by the District evaluated at least six measures as required by systems with between 2,500 and 9,999

Component (WAC #)	Requirements	District Status/Recommendations
	Existing Program: Describe existing WUE program and estimate amount of water saved through program over the prior six or more years. *Goals*: Describe proposed WUE goals in compliance with WAC 246-290-830. *Measures*: Provide at least 6 proposed WUE measures, required of water systems with 2,500 - 9,999 connections. Describe how measures address proposed goals and estimate projected water savings from implementation of measures. Describe how customers will be educated on measures. Explain how WUE program will be evaluated for effectiveness in the future. Quantitatively evaluate proposed measures for cost-effective from the system's perspective, including marginal costs of producing water, and/or whether the measures are cost-effective if costs are shared with other entities. Quantitatively or qualitatively evaluate measures to determine cost-effectiveness from the societal perspective. For measure to be implemented over the next six or more years, include a schedule and budget that demonstrates how they will be funded. The District may submit a schedule and budget for the entire water system plan approval period, if the approval period is longer than six years. DSL: Evaluate District's Water distribution system leakage in accordance with WAC 246-290-820.	connections. Measures were evaluated quantitatively for cost effectiveness and qualitatively on the basis of measures' potential effects on customer rates. The WUE Program is discussed further throughout this chapter and meets all requirements.
Distribution System Leakage (246-290-820)	Include Distribution System Leakage (DSL) totals in accordance with WAC 246-290-820 and report all actions taken to minimize leakage, if any. DSL totals should be recorded in both annual percent and volume. Percentage DSL must be calculated using the equation provided in WAC 246-290-820. Authorized consumption which cannot be metered, such as fire flow, must be estimated. If all or portions of transmission lines are excluded when determining DSL, estimate the amount of leakage from the excluded portion of transmission and describe how it is maintained to minimize leakage. Any water that cannot be accounted for is considered DSL. N/A The District is considered compliant if DSL is ten percent or less for the last three-year average, or if a water loss control action plan is provided.	The District is fully compliant with WAC 246-290-820. No water loss action plan is required, as the three-year average DSL is less than 10% annually. The District provides leakage volume statistics in their Water Use Efficiency Report (WUE).

Component (WAC #)	Requirements	District Status/Recommendations
Goals (246-290-830)	WUE Goals are designed to enhance the efficient use of water by a system's consumers (consumption per ERU). Goals must be developed in accordance with WAC 246-290-830. WUE programs should be designed to adequately address WUE Goals and programs must be modified if any previous goal has not been met. If the District determines that further reductions in consumption levels are not reasonably achievable, District shall provide written justification in accordance with WAC 246-290-830 to be included in WUE Program and Performance Report. Provide documentation of compliance with WUE Goal setting requirements as follow: (a) Goals shall be set in a public forum to provides opportunity for public participation and comment. Public notice must occur at least two weeks prior to the forum and should include the purpose, date, time, and location of forum, and how/where to access any supporting documents. (b) The following regulatory information must be made available to the public: (i) Efficiency Program requirements per WAC 246-290-810(4); (ii) Annual WUE performance reports in compliance with WAC 246-290-840; (iii) Description of water supply per WAC 246-290-100(4)(f)(iii)(B), or source description in accordance with WAC 246-290-105 (4)(f); (iv) Summary of public comments and how they were considered. The District's governing Board shall review all comments received and, following required goal setting process, shall reestablish District's WUE goals at least every six years. Existing public processes may be used if all other requirements of WAC 246-290-830 (4) are met. WUE Goals may be changed at any time, if in accordance with required goal setting process. Changes must be identified in next Performance Report.	The District has established 6 WUE goals, discussed in detail in Section 4.3.1. Goals are consistent with the purpose, scope, and setting requirements outlined in WAC 246-290-830. WUE Goals will be set in a public forum for which public notification will be sent out. Supporting documents will be uploaded to a designated website, along with all regulatory information required to be made available to the public.
Performance Reports (246-290-840)	Develop an annual report in accordance with WAC 246-290-840. Report should include total annual water production in volume; total DSL in volume and percentage; all actions taken to	The District includes an annual performance report with the annual CCR, and submits their

Component (WAC #)	Requirements	District Status/Recommendations
	minimize DSL; current WUE goals, goal schedule, and relevant WUE measures; and a narrative description of the District's progress towards goals. Submit report annually to Department of Health (DOH) and make available to the public.	performance report to DOH separately by July 1st every year.

As Table 4-1 depicts, Cross Valley is in compliance with the requirements for WUE established under the MWL. Discussion of the WUE goals for conservation and the program established to support the goal is provided in the following paragraphs.

4.3.1 Goal(s) for Conservation

The District began efforts to establish their goals for conservation in late 2007. To calculate a reasonable savings in water usage over the next reporting period, the District first looked at total customer consumption from 2014 to 2018. The District's water use from 2014-2018 is shown in Table 4-2. The historic and projected customer consumption data displayed in Table 4-2 and Figure 4-1 does not include non-revenue water, such as water used for testing fire hydrants and flushing water mains to improve water quality or water leakage from the system. In addition to the savings projected from participants in the conservation program, District staff is striving to minimize the amount of water used in day-to-day operations.

Table 4-2: Historical Customer Consumption

Year	Total Customer Water Use (Million Gallons)	Consumption by Customer Class (Million Gallons)				
		Residential	Commercial	Industrial	Government	Agriculture
2014	548.50	463.05	33.91	9.31	20.55	21.68
2015	596.89	516.19	35.05	9.04	8.84	27.77
2016	535.03	463.65	33.30	11.09	6.05	20.94
2017	586.40	513.64	34.19	10.38	10.11	18.08
2018	566.00	500.97	29.61	11.30	9.11	15.00
Average	566.56	491.50	33.21	10.22	10.93	20.69
Average % of Total Use		86%	6%	2%	2%	4%

* Estimated data based on historic billing records

Next, seasonal variations in water use were reviewed and indicate that water use during peak summer months approaches approximately 358 gallons per ERU per day. Other periods of the year water use averages between 138-228 gallons per ERU per day. District staff concluded it

was cost effective to further reduce both indoor and outdoor use as a method for lowering average day demand (ADD) and peak day demand (PDD). The Municipal Water Law (MWL) requires a measurable goal for conservation be evaluated and adopted through a public process to reduce customer demands over a six-year period. In 2021, the Board of Commissioners adopted the following goals for reducing water use:

Goal 1:

"For the Everett Supply Area, Cross Valley Water District will participate in the regional conservation program administered by the City of Everett, which is to reduce the regional demand for water, based on typical consumption volumes, by approximately 1.4 million gallons per day on an annual basis by the end of 2029.

Goal 2:

"For areas serviced by wells, Cross Valley Water District will allocate the necessary resources to save 10 gallons per day (GPD) per equivalent residential unit (ERU) through 2030. This represents a 3% reduction in daily consumption per ERU by 2030."

These goals endeavored to provide an annual savings of 0.5% over the previous year in terms of average consumption per ERU. Figure 4-1 displays projected daily consumption per ERU. There are two scenarios listed in the graph: the "blue" bars show current water use at different times of the year and the "green" bars to their left show projected water use in 2040 with the proposed WUE Program in place.

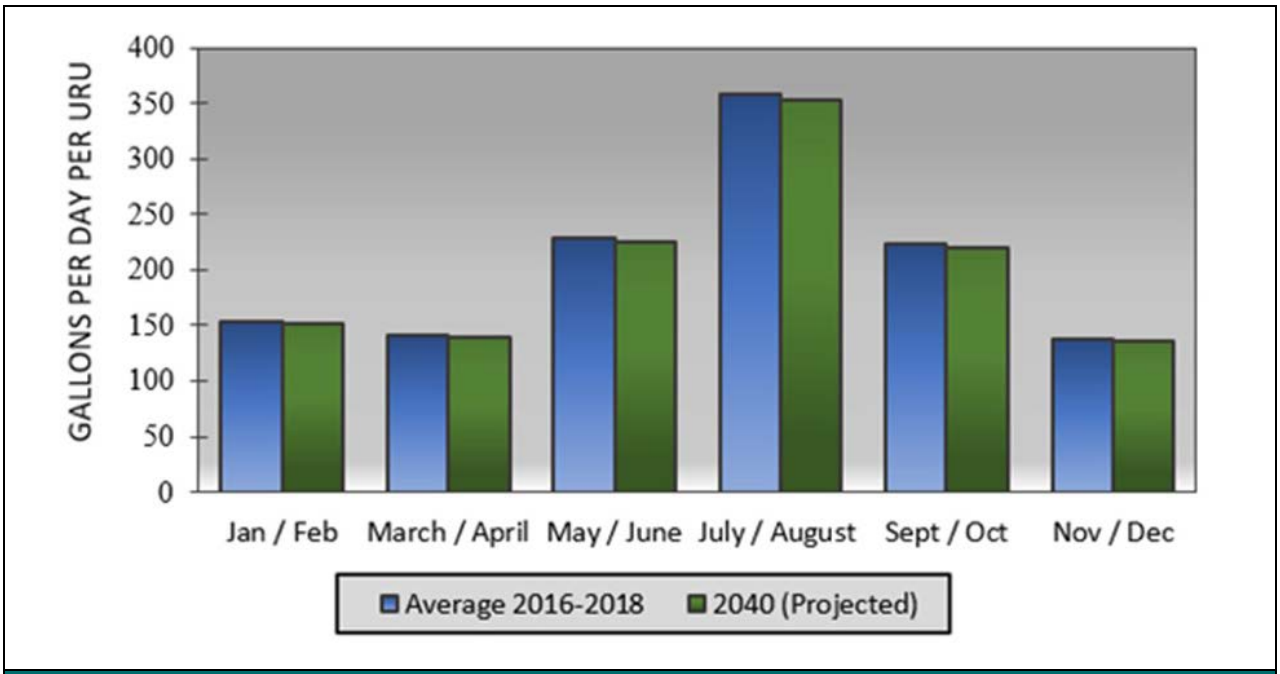

Figure 4-1: Historic and Projected GPD per ERU

As a wholesale customer of the City of Everett, Cross Valley is included in their regional goal of reducing water use. The District contributes to this regional goal by administering at least six of the WUE measures listed in Table 4-3 over a six year period. The measures listed in Table 4-3 have been evaluated and/or implemented for Cross Valley's WUE Program and have been adopted by the City of Everett and the District. A copy of the City of Everett's Conservation Program as put forth in the City's 2020 Comprehensive Water Plan, is provided in Appendix G.

Table 4-3: Water Use Efficiency Measures

Measure		Description	Annual GPD Saved Per Unit Distributed[1]
1.	Public Education	School curriculum outreach and the demonstration garden educate customers on water saving behavioral tips.	-
2.	Indoor Conservation Kits	Kits contain low-flow showerheads, bathroom aerators, and kitchen aerators.	20
3.	Outdoor Conservation Kits	Kits contain automatic water timers, spray nozzles, and new rubber washers.	5
4.	Leak Detection Program	Detection tablets indicate leaks in household fixtures and encourage repair.	5
5.	Business and School Audits	Indoor and outdoor audits determine ways schools and businesses can save water in landscape maintenance or in day-to-day operations.	50
6.	Conservation Pricing	The District's Tiered Structure discourages high consumption.	-
7.	Lawn Watering Schedule	This voluntary program designates which days certain households can water lawns to help mitigate peak demands	-

Note[1:] Savings are estimated and based on assumed participation from District customers. The expected savings from the Conservation Pricing, Lawn Water Schedule, and Public Education Program has not be calculated, but the measures will continue to exist as part of the District's comprehensive WUE Program.

4.4 WATER REUSE

Reclaimed water and water reuse is recognized as an effective method for improving the longevity of the District's sources of supply. With King County Metro's Brightwater Treatment Facility having opened in 2011, the District is in a unique position to benefit from the Class A reclaimed water that will be produced from the plant within its own service area. The District will continue to support efforts for industrial users and other potential candidates to obtain reclaimed water and will work with customers and King County to ensure service is provided where cost-effective and requested. None of the Cross Valley customer's currently receive reclaimed water service. The District has entered into an agreement with King County as part of the mitigation

related to construction of the Brightwater Wastewater Treatment Plant within the Cross Valley service area that established the District as the purveyor of reclaimed water within the service area. The District will work directly with King County to establish such service if it is requested and appropriate. Cross connection control facilities will be required and enforced by the District as part of its regular Cross Connection Control program.