
Silverdale Water District Water Use Efficiency Program

This document serves to summarize Silverdale Water District's Water Use Efficiency Program (WUEP) and conservation activities. The purpose of this plan is to maintain our water resource, reduce peak day demand, delay additional infrastructure costs by prolonging the need for additional water sources and storage, and to fulfill Washington State Department of Health's (DOH) Water Use Efficiency Rule (WUER). This document will be used to communicate Silverdale's WUEP to customers, its governing body, interested parties, and DOH.

This document has three purposes: (1) review Silverdale's compliance with State conservation planning requirements, (2) describe Silverdale's recent conservation program, and (3) describe the conservation program that Silverdale will implement from 2013 through 2018.

1. Conservation Requirements and Compliance Summary

The conservation requirements that must be addressed in water system plans are contained in the following sources:

- State of Washington Water Use Efficiency Rule (January 2007)
- Department of Health *Water Use Efficiency Guidebook* (January 2011)

The State of Washington revised water conservation planning requirements as a result of the 2003 Municipal Water Law. An outgrowth of that law is the Water Use Efficiency Rule (Rule), which was finalized in January 2007. The Rule has several requirements and corresponding compliance dates. Some of the requirements are associated with water system plans, while other requirements are independent of the 6-year water system planning cycle.

There are seven main categories of requirements: (1) meters, (2) data collection, (3) distribution system leakage, (4) goals, (5) efficiency program, (6) demand forecast, and (7) performance reports. Table 1-1 lists the requirements of the Rule and shows that Silverdale is in compliance with current requirements, and is well prepared to comply with upcoming requirements.

Table 1-1 Conservation Requirements and Compliance

CATEGORY	WAC ¹ SECTION	COMPLIANCE DEADLINE	REQUIREMENT	SILVERDALE IN COMPLIANCE?
1. Meters	246-290-496	Fully metered by January 22, 2017. Submit metering plan by July 1, 2008.	1. Meter all sources .	Yes , Silverdale meters all water produced.
			2. Meter all service connections .	All of Silverdale's service connections are metered, except for a recently acquired failing water system with 144 connections. These will be metered by 2015.
2. Data Collection	246-290-100	WSPs ² submitted after January 22, 2008.	1. Provide monthly and annual production/purchase numbers for each source.	Yes , provided in Section 4.1 of Silverdale's 2013 Water System Plan.
			2. Provide annual consumption by customer class.	Yes , provided in Section 4.2 of Silverdale's 2013 Water System Plan.
			3. Provide " seasonal variations " consumption by customer class.	Yes , provided in Section 4.2 of Silverdale's 2013 Water System Plan.
			4. Evaluate reclaimed water opportunities.	Yes , details provide in WSP. Silverdale is working to implement a reclaimed water system.
			5. Provide annual quantity supplied to other public water systems .	Silverdale does not supply water to other public water systems for non emergencies.
			6. Consider water use efficiency rate structure .	Silverdale's rates consist of two components: 1) a base charge and 2) a volume charge with inclining block rates. Over the last 5 years Silverdale has stratified the tiers within the rates system. This rate structure rewards those who use less.
3. Distribution System Leakage (DSL)	246-290-820	First report completed by July 1, 2008. First compliance determination made by July 1, 2010.	1. Calculate annual volume and percent using formula defined in the Rule.	Yes , as documented in Section 4.3 of Silverdale's 2013 Water System Plan, Silverdale's 2009-2011 3-year average distribution system leakage was 5%, which is well under the 10% threshold.
			2. Report annually: annual leakage volume, annual leakage percent, and, for systems not fully metered, meter installation progress and leak minimization activities.	
			3. Develop water loss control action plan (if leakage is over 10% for 3-year average).	
4. Goals	246-290-830	Goals established by January 22, 2008.	1. Establish measurable (in terms of water production or usage) conservation goals and re-establish every 6 years. Provide schedule for achieving goals.	Yes , measurable goals were established through a public process on July 11, 2013. See Section 3 of this document.
			2. Use a public process to establish the goals.	
			3. Report annually on progress.	Yes , Silverdale reports on progress towards meeting the goal to DOH via DOH's website and to its customers via Silverdale's annual water quality report and May newsletter.

CATEGORY	WAC ¹ SECTION	COMPLIANCE DEADLINE	REQUIREMENT	SILVERDALE IN COMPLIANCE?
5. Efficiency Program	246-290-810	WSPs submitted after January 22, 2008.	1. Describe existing conservation program.	Yes , see Section 2.1 of this document.
			2. Estimate water saved over the last 6 years due to conservation program.	Yes , see Section 2.2 of this document.
			3. Describe conservation goals .	Yes , see Section 3.1 of this document.
			4. Implement or evaluate 1-12 measures , depending on size. (6 measures for Silverdale based on 6,000 connections.)	Yes , Silverdale is required to implement or evaluate 6 measures. Silverdale has chosen to implement 6 measures. See Section 3.2 of this document.
			5. Describe conservation programs for next 6 years including schedule, budget, and funding mechanism.	Yes , see Sections 3.1 and 3.2 of this document.
			6. Describe how customers will be educated on efficiency practices.	
			7. Estimate projected water savings from selected measures.	
			8. Describe how efficiency program will be evaluated for effectiveness.	
			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	WSPs submitted after January 22, 2008.	1. Provide demand forecast reflecting no additional conservation .	Yes , see WSP Section 4.
			2. Provide demand forecast reflecting savings from efficiency program .	
			3. Provide demand forecast reflecting all "cost effective" evaluated measures .	N/A . Since Silverdale is implementing the required minimum number of measures (6), this forecast is not required.
7. Performance Reports	246-290-840	First report completed by July 1, 2008.	1. Develop annual report including goals and progress toward 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 , Silverdale' performance reports are submitted to DOH via DOH's website and are provided to its customers via Silverdale's annual water quality report and May newsletter.
			2. Submit annually by July 1 to the Department of Health (DOH) and customers and make available to the public.	

1. WAC = Washington Administrative Code

2. WSP = Water System Plan

2. Recent Conservation Program

2.1 Measures

Silverdale's recent conservation program has consisted of the following conservation measures, the details of which are discussed below:

- Source Meters
- Service Meters
- System Leak Detection and Repair
- Consumption History on Bills
- Public Outreach Residential Showerheads
- Inclining Block Rate Structure
- Customer Leak Detection Program

Source Meters

Source meters are a critical conservation tool because accurate water production data are used to develop conservation priorities, goals, and programs. Silverdale has source meters on all production wells. Silverdale calibrates the source meters annually.

Service Meters

Service meters at customer connections are another key component of providing accurate water information for conservation planning. Silverdale has meters on all service connections, except for a recently acquired failing water system with 144 connections, which will be metered by 2015.

Silverdale has a formal meter testing and replacement program focused on meters 2 inches and larger. Most of these large meters are tested (and repaired or replaced as appropriate) every 1 to 5 years.

Meters that are smaller than 2 inches are not tested on a frequent basis. Silverdale does periodically select a number of meters of a certain age to check the accuracy as a representative to the system as a whole. Silverdale's billing software is programmed to alert staff if consumption varies significantly from historical use. Significantly lower consumption could be an indication that a meter is not registering properly. Significantly higher consumption could be an indication of a leak.

System Leak Detection and Repair

Operating an efficient physical system that minimizes leaks demonstrates a commitment to sound financial and resource management. Silverdale has both an informal and formal leak detection and repair program which relies on a visual method of leak detection. Leaks from buried pipes often become apparent due to wet spots on the ground and greener spots on lawns. When these indicators are present, the areas are investigated for possible leaks. Water

quality tests indicating the presence of chlorine can confirm whether the water is indeed a leak from Silverdale's system. Leaks are promptly repaired. Silverdale formally checks consumption versus production at the pressure zone level 6 times a year with meter readings. If this calculation indicated an increase in distribution system leakage, Silverdale would implement measures to detect the leak.

Consumption History on Bills

Customer bills that provide historical consumption data allow customers to understand how their water use varies throughout the year and from year to year. This information helps customers make informed choices about how they manage their water use, including implementing conservation. All of Silverdale's customer bills include historical consumption data.

Public Outreach

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

- **School Education:** Silverdale works with a group of other governmental agencies to put on an annual Water Festival. This day brings together more than 1,000 4th graders to celebrate and study water and the environment. The curriculum covers water conservation, as well as other resource issues including local water quality, waste reduction, storm water concerns and energy conservation.
- **Community Events:** Silverdale participates in several community events throughout the year including The Kitsap Home and Garden Show, Kids Day, and The Kitsap Fair. Participation has typically included exhibiting conservation displays and giving away promotional items containing conservation messages.
- **Web site and Newsletter:** Silverdale posts water conservation materials, including conservation tips, on its Web site and in a bi-monthly newsletter.

Residential Showerheads

Silverdale maintains the availability of free efficient showerheads for residential customers. The program is advertised twice per year, once in the billing message and once in the newsletter. On average 40 to 50 showerheads are given away per year. Recently Silverdale has started tracking properties where showerheads have been distributed.

Inclining Block Rate Structure

Silverdale has utilized an inclining block rate structure for all accounts for many years. More recently, Silverdale has stratified the tiers within the structure. This has encouraged customers to maintain more efficient water use and has helped maintain sufficient revenue while allowing low water users to pay reasonable rates.

Leak Detection for Customers

Leaks waste a lot of water and can cost customers significant amounts of money. Silverdale alerts customers to potential leaks it finds during meter reading and helps customers investigate upon request. The technician that makes contact with the customer will investigate multiple fixtures; however toilet dye tablets are given to check for leaks unless a definitive leak has been identified. This program is very successful both at saving water and offering great customer service to our residents.

2.2 Estimated Savings

Silverdale staff have not historically calculated or tracked the estimated savings associated with the conservation program. This will change in the future as a systematic tracking method is implemented to track Silverdale's new conservation goal required by the Water Use Efficiency Rule.

3. 2013–2018 Conservation Program

The time period for the conservation program described in this section mirrors the 6-year planning period of the water system plan, which is 2013–2018. Silverdale funds the conservation program through rates paid by its water customers.

3.1 Goals

The conservation program's goals should reflect the drivers behind a utility's pursuit of water conservation. Conservation drivers can include meeting regulatory requirements, minimizing impacts on water resources, decreasing operating costs, and deferring capital costs and obtaining new supply. The conservation driver(s) applicable to any one utility depend on that utility's specific supply situation and cost structures. Silverdale's conservation program is primarily driven by minimizing impacts on water resources and reducing peak day demand.

Silverdale's official goals are below. These goals were established using a public process that included conducting a public meeting at the July 11, 2013 Commissioner meeting.

Goals:

1. Silverdale Water District will provide 150,000 gallons of recycled water on the peak day by the end of 2018. This will result in saving roughly more than 14,000,000 gallons of potable water annually.
 - a. $(150,000 \text{ gallons on peak day}) \times (80\% \text{ conversion factor to reduce to average peak season day}) \times (120 \text{ days in peak season}) = 14,400,000 \text{ gallons over the peak season}$
 - b. This will be more than a 3% reduction in peak day demand.
2. The average single family connection uses 197 gallons per day, for the years 2009, 2010 and 2011. Silverdale will reduce the per day demand of single family connections by 3%, based on a three year average by 2018. When Silverdale meets this goal, the average

single family connection will use less than 191 gallons per day, based on 2016, 2017 and 2018.

3.2 Measures

Silverdale’s conservation program for 2013–2018 consists of the six measures shown in Table 3-1. The details of each measure are discussed below. These measures were selected based on a combination of factors including applicability to Silverdale’s service area, customer acceptance, cost effectiveness, and/or savings potential. Silverdale will continue to use source meters, service meters, and system leak detection and repair, although those activities are not counted as official conservation “measures” under the conservation Rule.

Table 3-1 2013-2018 Conservation Program

MEASURE	RELATIONSHIP TO CURRENT PROGRAM
1. Consumption History on Bills	Continuation
2. Public Outreach	Continuation
3. Customer Leak Detection	Continuation
4. Residential Showerhead Program	Continuation
5. Inclining Block Rate Structure	Continuation
6. Reclaimed Water System	Continuation

Consumption History on Bills

Silverdale will continue to provide consumption history on customer bills for all customer sectors, as described in Section 2.1.

Public Outreach

Silverdale will continue its public outreach programs including providing school education, participating in community events, and promoting conservation on its Web site, as described in Section 2.1

Customer Leak Detection

Silverdale will continue its customer leak detection program, as described in Section 2.1.

Residential Showerhead Program

Silverdale will continue its showerhead program, as described in Section 2.1. Silverdale plans to increase this program to reach 100 devices annually and to evaluate homes that have received showerheads for reduced water use.

Inclining Block Rate Structure

Silverdale will continue to utilize an inclining block rate structure, as described in Section 2.1

Reclaimed Water System

Silverdale will continue to work on implementing the reclaimed water system throughout Silverdale. This program will replace potable supplies for irrigation needs and toilet flushing at commercial properties. Details are available in the 2013 Water System Plan.

3.3 Estimated Savings

The estimated savings of the 2013–2018 conservation program are shown in Table 3-2. Upon full implementation of the program, besides the reclaimed water program, the program is expected to save more than 0.89 million gallons per year. It should be noted that these savings are not the full savings Silverdale anticipates achieving between 2013 and 2018 by all the measures listed in Table 3-1; rather, these values reflect the estimated savings from the measures that are readily quantifiable. The savings achieved by the program, and the corresponding progress toward reaching Silverdale’s goal, will be estimated by tracking customer participation and multiplying participation by per-unit savings.

Table 3-2 Estimated Savings for 2013–2018 Conservation Program

CONSERVATION MEASURE	PARTICIPANT TYPE	HOUSEHOLDS ¹	PARTICIPANTS ²		SAVINGS (GALLONS PER DAY)	
			ANNUAL	OVER 6-YR PROGRAM	NEW EACH YEAR	TOTAL AT FULL IMPLEMENTATION OF PROGRAM
Customer Leak Detection - single family customers	Single Family Household	5,288	180	1,080	410	2,460
Customer Leak Detection - multifamily customers	Multifamily Household	3,053	20	120	317	1,902
Showerhead Program	Single Family Households	5,288	100	600	1,550	9,300
Total		n/a	n/a	n/a	2,277	13,662

1. Households in the year 2011.

2. Households that use the toilet leak detection dye tablets given to them by Silverdale during leak investigation; 90% participation is assumed. Assumes 10 units per multi-family connection. Number of households annually to take advantage of showerhead program.

3.4 Effect on Demand

Silverdale’s demand will be reduced by the expected savings from the conservation program. The demand forecast presented in the water system plan includes the following four forecasts:

- Baseline demand forecast (without traditional conservation or the reclaimed water program),
- Demand forecast with traditional conservation reductions,
- Demand forecast with reclaimed water reductions, and

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- Demand forecast with both traditional conservation reductions and reclaimed water reductions.

The demand forecast with traditional conservation reductions reflects an anticipated 3% reduction in the single family customer category between 2012 and 2018. This reduction was accomplished by steadily reducing the single family water use factor from 197 gpd per single family connection in 2012 to 191 gpd by 2018, which is an annual reduction of 0.5%. Silverdale plans to continue conservation efforts beyond 2018. However, since the conservation goals beyond 2018 are not defined at this time, the single family water use factor was reduced by only 0.25% annually between 2018 and 2032.

For the demand forecast with reclaimed water reductions, the amount of potable water that will be replaced by reclaimed water was estimated and the demand forecast was reduced by this amount. The reclaimed water estimates are based on: 1) Silverdale's 2009 Dyes Inlet Water Reclamation Facility Feasibility Study, 2) Silverdale's 2011 amendment to its 2005 Water System Plan, and 3) subsequent refinements by Silverdale staff. Reclaimed water is expected to become available in 2017 and Silverdale anticipates steadily increasing use of reclaimed water to 1.0 mgd maximum day demand by the end of the 20-year planning period of the 2013 Water System Plan. The average day demand savings is calculated based on peaking factors defined in the 2009 Feasibility Study.