

Appendix S: Example of a Small Municipal WUE Program

Note/Disclaimer: The Department of Health did not officially approve this WUE program. We consider it to be a good example of how you might want to think about writing your own program if you operate a smaller water system. The [Partnership for Water Conservation](#) helped this small water system create and write their WUE program.

Objectives

The objectives of this document are:

- Describe how the Clear Lake Water District (Clear Lake) will meet the state requirements of the Water Use Efficiency Rule (WUE Rule)
- Outline the water use efficiency goal Clear Lake has established
- Describe the water use efficiency measures that Clear Lake has chosen to implement to meet its goals

Clear Lake's water use efficiency program will be re-evaluated annually.

New Water Use Efficiency Plan

Under the WUE Rule (for more information on the WUE Rule see Addendum C), Clear Lake must set water use efficiency goals by July 1, 2010 and measure progress each year toward meeting those goals. Goals must include a measurable outcome, address water supply characteristics, and include an implementation schedule. Clear Lake must also evaluate or implement efficiency measures to help meet the goals.

Goal and Measures

Clear Lake's goal will be to reduce their summer usage by .5% by the year 2012 or roughly 25,000 gallons by the year 2012. Clear Lake evaluated various different scenarios and came up with an attainable goal for a water savings. Because Clear Lake's historic usage is highest during the summer months, the community decided to focus water savings during those times.

Clear Lake will reduce its water use by utilizing two different measures:

- 1) Clear Lake will encourage their customers to conserve water by implementing a conservation rate structure to target demand during the summer for outdoor water use. The new rate structure will target and affect most of the excessive outdoor water users during the summer months.
- 2) Clear Lake will increase efforts to promote water conservation among their customers and reduce overall water demand. They will more proactively focus on efforts to educate their customers about water conservation during all seasons. This educational information will primarily be provided bi-monthly to customers in the form of tips for outdoor and indoor water use. These will be in the form of regular messages included in their billings. Clear Lake will also include separate mailings for seasonal tips such as those for winterizing houses to prevent leaks. Education during the summer months will focus on reducing outdoor water use, and during the winter months will focus on reducing indoor use.

Table 1 summarizes the years 2008 and 2009 production and consumption volumes and water loss.

Table 1
2008/2009 Town Distribution System Leakage Summary

Month	Production (gal)	Consumption (gal)	Distribution System Leakage	
			Volume (gal)	Percentage
2008				
Jan/Feb	1,008,304	732,292	276,012	27.4%
Mar/Apr	833,011	733,788	99,223	11.9%
May/June	1,156,408	1,712,172	(555,764)	(48.1)%
July/Aug	2,187,152	2,113,848	73,304	3.4%
Sep/Oct	1,959,644	1,248,412	711,232	36.3%
Nov/Dec	1,052,436	824,296	228,140	21.7%
Flushing*		475,000	(475,000)	
TOTALS	8,197,955	7,839,808	358,147	4.4%
2009				
Jan/Feb	1,443,640	1,306,756	136,884	9.5%
Mar/Apr	878,152	779,416	98,736	11.2%
May/June	1,608,200	1,498,992	109,208	6.8%
July/Aug	2,347,224	2,196,128	151,096	6.4%
Sep/Oct	1,091,332	1,331,440	(240,108)	(22.0)%
Nov/Dec	1,315,732	1,037,476	278,256	21.1%
Flushing*		213,400	(213,400)	
TOTALS	8,684,280	8,363,608	320,672	3.7%

* Misc Flushing and Fire Dept Usage

Water Use Efficiency Measures

The WUE Rule requires that water efficiency measures must be implemented or evaluated. WAC 246-290-810 identifies the minimum number of water use efficiency measures that must be evaluated based on system size. Clear Lake has less than 500 connections and therefore must evaluate or implement one supplementary water use efficiency measure in addition to the mandatory measures. The following sections describe the mandatory measures and the supplemental measures Clear Lake will implement.

Mandatory Measures:

1. Source and Service Metering and Meter Calibration

Clear Lake currently meters all customers and sources. Clear Lake is already in compliance with this requirement.

2. Leak Detection and Water Accounting

Clear Lake has maintained a low Distribution System Leakage (DSL). They are a relatively new system and have not had many problems with leakage. Their three-year rolling average is 3.3 percent and is in compliance with this requirement.

3. Customer Education

Clear Lake sends out seasonal water conservation tips to their customers during the beginning of each season to help prepare customers for the changing season.

Supplementary Measures Clear Lake will Implement:

1. Rates that Encourage Efficiency

Clear Lake is working with the Partnership for Water Conservation and the Rural Community Assistance Corporation to determine a competitive rate structure. They want to implement a rate structure that will provide financial sustainability as well as encourage high water users to reduce usage during the summer months of June, July, and August.

2. Bi-monthly Educational Seasonal Conservation Information

Clear Lake will offer more frequent educational information outlining more efficient indoor and outdoor water use during each billing cycle. Bi-monthly educational tips will target the high users of water in the area. Clear Lake will educate the public about why water conservation is important and why there is a particular need to lower water usage during the peak months of June, July, and August. Conservation tips will address seasonal topics such as outdoor water reduction in the yard, and during the winter months will focus on indoor leak prevention tips.

Clear Lake will implement all of the measures listed previously as part of their new WUE Program as well as continue with measures they are currently using. Table 2 summarizes these measures.

Table 2
New WUE Program Measures

Implemented Measure	Applicable Customer Classes
Conservation Rate Structure	1
Educational Materials	1
Total Measures Counted	2

Target Water Savings Projections

Table 3 shows projected savings from these goals and measures.

Table 3
Projected Water Use Efficiency Savings

Year	Population Summer	Population Winter	Usage (gal/capita/day) Summer	Usage (gal/capita/day) Winter	Yearly Usage Savings (Gal)
2007	313	273	77.21	47.02	N/A
2008	321	281	85.93	45.05	N/A
2009	325	285	83.22	60.66	N/A
2010	325	285	81.98*	50.91	8,333
2011	325	285	81.84*	50.91	16,667
2012	325	285	81.71*	50.91	25,000
Maximum Capacity	378	338	N/A	N/A	N/A

*Based on 3-year average usage

Demand Forecasting

The WUE Rule has added new criteria to consider when preparing demand forecasts. Clear Lake is now required to project demands both with and without anticipated savings from the WUE program. It also provides a basis to measure conservation success versus actual water use data. Clear Lake has a maximum of 15 connections. All connections have been sold, limiting future growth of the system.

Table 4 provides water demand forecasts with and without anticipated savings from the WUE Program.

**Table 4
Demand Forecast With and Without Conservation Savings**

Year	Population Summer	Population Winter	Without Conservation Average Day Demand (gpd) Summer	With Conservation Average Day Demand (gpd) Summer	Average Day Demand (gpd) Winter
2007	313	273	24,168	N/A	12,835
2008	321	281	27,578	N/A	12,654
2009	325	285	27,318	N/A	17,258
2010	325	285	26,354*	26,300*	14,249*
2011	325	285	26,354*	26,263*	14,249*
2012	325	285	26,354*	26,218*	14,249*
Maximum Capacity	378	338	N/A	N/A	N/A

*Based on 3 year avgs

Annual Performance Reporting

Clear Lake must submit a performance report to the Department of Health by July 1st, and each year thereafter. The annual report must include:

- Total source production and system wide consumption
- Distribution system leakage in percentage and volume
- Goal description, schedule, and progress toward meeting goals

The Washington Department of Health, Office of Drinking Water (DOH) has developed a report form that must be used. DOH has also developed a spreadsheet to track monthly production and consumption volumes and calculated DSL volume and percentage. These reports will be made available to the public.

Summary

To comply with the new requirements set forth in the WUE Rule Clear Lake has set a goal to reduce summer water use by .5% by the year 2012. Clear Lake will employ several measures to accomplish this goal, which are as follows:

- Implementing a new rate structure
- Increase customer education

If their goal is realized, Clear Lake will see a total savings of 25,000 gallons per year by 2012.

Addendum A

History of Clear Lake Water District's Water Use and Programs

In order to understand the Clear Lake's (Town) water efficiency goals, it is important to review their history prior to the setting of the current goals.

Water Supply Characteristics

The current source of water for Clear Lake is one ground water well. Clear Lake is within the Nisqually Watershed Resource Inventory Area 11 (WRIA 11).

The water right was granted in 1995. Clear Lake acquired a well site located in the southeast ¼ of the northwest ¼ of the northeast ¼ of Section 27, Township 17 North, Range 4 East (27/04E-27B). The well was completed at a depth of 400 feet and developed in a water-bearing sand and gravel from 369 to 384 feet below ground. The water right for the well allows for an instantaneous withdrawal of 230 gallons per minute (gpm) and an annual withdrawal of 59 acre-ft/yr (19.2 MG/Yr).

Table 5 summarizes water rights held by Clear Lake.

Table 5
Clear Lake's Existing Water Rights

Source Name	Permit/ Certificate No.	Primary or Supplemental Right	Existing Water Rights		
			Instantaneous	Annual Withdrawal	
			gpm	acre-feet	MG
Groundwater Well	G2-28922	Primary	230	59	19.2

The Effects of the Clear Lake's Past Programs

Clear Lake's past conservation efforts have been mainly educating their customers about what they can do to reduce their water consumption. They have periodically sent out seasonal tips to their customers encouraging them to prepare for the winter or summer months. Clear Lake has focused on educating their customers about winterizing their pipes for the winter months and proper watering techniques for the summer months. Because Clear Lake has a seasonal population it can sometimes take a month or two to find out that a pipe has broken or that a hose has been left on. The winter population is very low and uses a very small amount of water, so Clear Lake wants to focus its efforts on the summer months.

Table 6 summarizes water use since 2007.

Table 6
Historic Annual Use Per Capita (may change to winter/summer)

Year	Population Summer	Population Winter	Gal/capita/day Summer	Gal/capita/day Winter
2007	313	273	77.21	47.02
2008	321	281	85.93	45.05
2009	325	285	84.19	60.66

Water Meters

Clear Lake currently has meters on all existing customer connections and the source, and meters all new connections.

Data Collection

Clear Lake collects data on a regular basis. The source meter is read every other day and consumption meters are read bi-monthly for billing purposes. Clear Lake reports water produced and consumed annually.

Distribution System Leakage

Clear Lake has maintained very reasonable water loss. They check meters regularly and can usually spot irregular water usage. They have a fairly new system and have not had many problems with the system so far. The biggest water loss is usually during the winter from a customer’s broken pipe. Their three-year rolling average is 3.3 percent and meets the WUE guidelines of being under 10 percent.

Table 7 summarizes the last three years’ production and consumption volumes water loss, also called distribution system leakage.

Table 7
Historic Distribution System Leakage Summary

Year	Production (gal)	Consumption (gal)	Distribution System Leakage		
			Volume (gal)	%	3-yr rolling average
2007	7,242,136	7,122,148	119,988	1.7%	NA
2008	8,197,955	7,839,808	358,147	4.4%	NA
2009	8,684,280	8,363,608	320,672	3.7%	3.3%

Customer Education

Clear Lake has promoted water conservation and educated customers about efficient water use by including a conservation tip in their first seasonal billing statements.

Conservation Rate Structure

Clear Lake established a tiered rate structure in 2005 to comply with the Municipal Water Law. They established a three-tiered structure after checking and comparing the rates of several community systems in the area. Clear Lake has seen a steady rise in water consumption, particularly during the summer months. The current rate structure does not evenly distribute the costs to the average consumer. The high users of water are subsidized by the low users of water under the current rate structure.

The current ensure financial sustainability for the water system. The new rate structure will be based on the budgeting needs of the water system to include regular calibration of meters, maintenance, and replacement used in water pumping. Additionally, the new rate structure will also be structured to target the excessive water user's price signal about the value of water among the top tier users. A new rate structure would help lower excessive outdoor water use. Additionally the new rate structure will more evenly distribute the costs to the second and third tier of customers. Future review of the rate structure will determine if any changes will be necessary for the water system.

Table 8
Town Water Rate Summary in CCF

Customer Class	Base Rate	Tier 1 0-15 (CCF) Charge per 100 Cubic Feet(CCF)	Tier 2 15-30(CCF) Charge per 100 Cubic Feet(CCF)	Tier 3 Over 30 (CCF) Charge per 100 Cubic Feet(CCF)
Single Family	\$20.00	\$0.65	\$0.90	\$1.25

Table 9
New Town Water Rate Summary in CCF

Customer Class	Base Rate	Tier 1 0-15 (CCF) Charge per 100 Cubic Feet(CCF)	Tier 2 Over 15 (CCF) Charge per 100 Cubic Feet(CCF)
Single Family	\$20.00	\$1.25	\$1.90

Addendum B

The Water Use Efficiency Rule

Water Use Efficiency Rule Background

The Washington legislature passed the Water Use Efficiency Act of 1989 (43.20.230 RCW), which directed the Department of Health (DOH) to develop procedures and guidelines relating to water use efficiency. In response to this mandate, the Department of Ecology (Ecology), the Washington Water Utilities Council, and DOH jointly published a document titled *Conservation Planning Requirements* (1994).

In 2003, the Municipal Water Supply – Efficiency Requirements Act (Municipal Water Law) was passed and added new requirements to RCW 70.119A. It requires additional conservation measures and serves as the new standard for water efficiency for all public water systems, in particular municipal water suppliers. The Municipal Water Law, among other things, directed DOH to develop the Water Use Efficiency Rule (WUE Rule), which became effective January 22, 2007. The WUE Rule is outlined in WAC 246-290 and the *Water Use Efficiency Guidebook* (DOH Publication #331-375). These documents provide guidelines and requirements regarding the development and implementation of conservation and efficiency programs for public water systems and municipal water suppliers. Conservation and efficiency programs developed in compliance with these documents are required by DOH and by Ecology as part of a public water system water right application. Conservation must be evaluated and implemented as an alternate source of supply before state agencies approve applications for new or expanded water rights.

The WUE Rule sets more stringent requirements for public water systems. The Water Use Efficiency Guidebook replaces the 1994 Conservation Planning Requirements and is comprised of eight chapters:

1. Introduction to Water Use Efficiency Requirements
2. Water Meters
3. Data Collection
4. Demand Forecasting
5. Water Use Efficiency Program
6. Distribution System Leakage
7. Goal Setting and the Public Forum
8. Annual Performance Report

Water Use Efficiency Descriptions and Requirements

The *Water Use Efficiency Guidebook* establishes varying implementation and evaluation requirements for municipal water suppliers (MWS). The new requirements focus on the importance of measuring

water usage and evaluating the effectiveness of the WUE program. There are three fundamental elements to the Rule, including planning, distribution leakage standards, and goal setting and performance reporting.

Table 10
Summary of WUE Requirements

Requirement	Deadline for MWS under 1,000 connections
Begin collecting production and consumption data	January 1, 2008
Include WUE program in planning documents	January 22, 2008
Set WUE goals	July 1, 2010
Submit service meter installation schedule	July 1, 2009
Submit first annual performance report	July 1, 2010
Meet distribution system leakage standard (based on 3-year rolling average)	July 1, 2011, or 3 years after installing all service meters
Complete installation of all service meters	January 22, 2017

Water Meters

Metering all water production and consumption is critical for determining system-wide and individual water use efficiency. The Rule sets deadlines for meter installation and data collection, which are shown in Table 11.

Table 11
Meter and Data Collection Deadlines

Requirement	Deadline for MWS under 1,000 connections
Install production meter(s)	January 22, 2007
Begin collecting production and consumption data	January 1, 2008
Submit service meter installation schedule	July 1, 2009
Complete installation of all service and intertie meters	January 22, 2017

As Table 11 indicates, the WUE Rule requires production meters on all existing and new water sources now, and requires consumption meters on all customer connections by 2017.

Data Collection

The WUE Rule requires regular collection of production and consumption data. Data must be reported in Clear Lake's planning documents and in its annual performance report to DOH. Water use data will be used for the following:

- Calculating leakage
- Forecasting demand for future water needs
- Identifying areas for more efficient water use
- Evaluating the success of the WUE program
- Describing water supply characteristics
- Aiding in decision-making about water management

It was recommended by DOH to begin collecting production and consumption data by January 1, 2008 in order to have a year's worth of data available to prepare the first annual report, due July 1, 2009.

The WUE Rule also sets requirements for collecting source and service data. Source meters must be read monthly and reported in monthly and annual totals. Service meter totals must be reported in annual amounts for each customer class, although it is recommended to read meters every one to two months.

Distribution System Leakage

The WUE Rule requires that water distribution systems have a three-year rolling average leakage rate of less than 10 percent of finished water production by July 1, 2011. Distribution system leakage is defined as the water lost from the distribution system and includes both apparent losses and real losses. Apparent losses include things such as theft, meter inaccuracies, and data collection errors. Real losses are the physical losses from the distribution system and include such things as reservoir overflows and leaky water mains. Known or credibly estimated losses can be excluded from the leakage calculations and may include uses such as construction, firefighting, and flushing.

Distribution system leakage for Clear Lake equals the difference between the treated supply volume from each source and the volume measured at the customers' meters plus any credibly estimated authorized unmetered usage.