1 | EAST WENATCHEE WATER DISTRICT 2021 WATER USE EFFICIENCY PROGRAM

INTRODUCTION

The District is required to develop and implement a water use efficiency plan as described in WAC 246-290-800. The following discussion represents the District's effort to follow those requirements. DOH has published a guidance document titled the Water Use Efficiency (WUE) Guidebook. The Washington Water Utilities Council sets forth the guidelines and requirements for public water systems regarding water use reporting, demand forecasting methodology and conservation programs. These requirements are based on statutes directing DOH and the Washington State Department of Ecology (Ecology) to encourage WUE. Ecology will also consider the implementation of an approved conservation plan in all water right permits issued by Ecology for public water systems.

WATER USE EFFICIENCY RULE

The 2003 Municipal Water Law (HB-1338) directed the Washington State Department of Health (DOH) to develop a new rule for Municipal Water Supply – Efficiency Requirements Act, Chapter 5, Laws of 2003 First Special Session, memorialized in Washington Administrative Code (WAC) 246-290-800. The Municipal Water Supply Efficiency Requirements Act, also known as the Municipal Water Law, became effective in 2007, and was upheld by the Washington State Supreme Court in 2010. The intent of the program is to help reduce the demand that growing communities, agriculture, and industry have placed on the state's water resources and to better manage these resources.

WATER SOURCE DESCRIPTION

The District currently obtains all of its water from the Regional Water System, with emergency supply from Well Nos. 4, 5, and 7. The Regional Water System source is the East Bank Aquifer near Rocky Reach Dam. The capacity of that aquifer is sufficient to supply the Regional service area for at least the next 20 years. *Volume 2 of the City of Wenatchee Water System Plan* contains further information regarding the Regional Water System.

The District owns and shares its water rights as a one-third tenant in common with the City of Wenatchee and Chelan County PUD. Water rights are held through the Regional Contract for common use by the three partners. Therefore, a water rights self-assessment for just the District is not applicable.

A water rights and source capacity analysis was performed in the 2019 City of Wenatchee Water System Plan Volume 2. The analysis in that plan concluded adequate physical source capacity through 2035 and water rights to serve beyond 2070. A study is currently in process to review

other future water sources. The Regional partners also purchased water rights that have been put into the State Water Trust Account until needed to meet system demands.

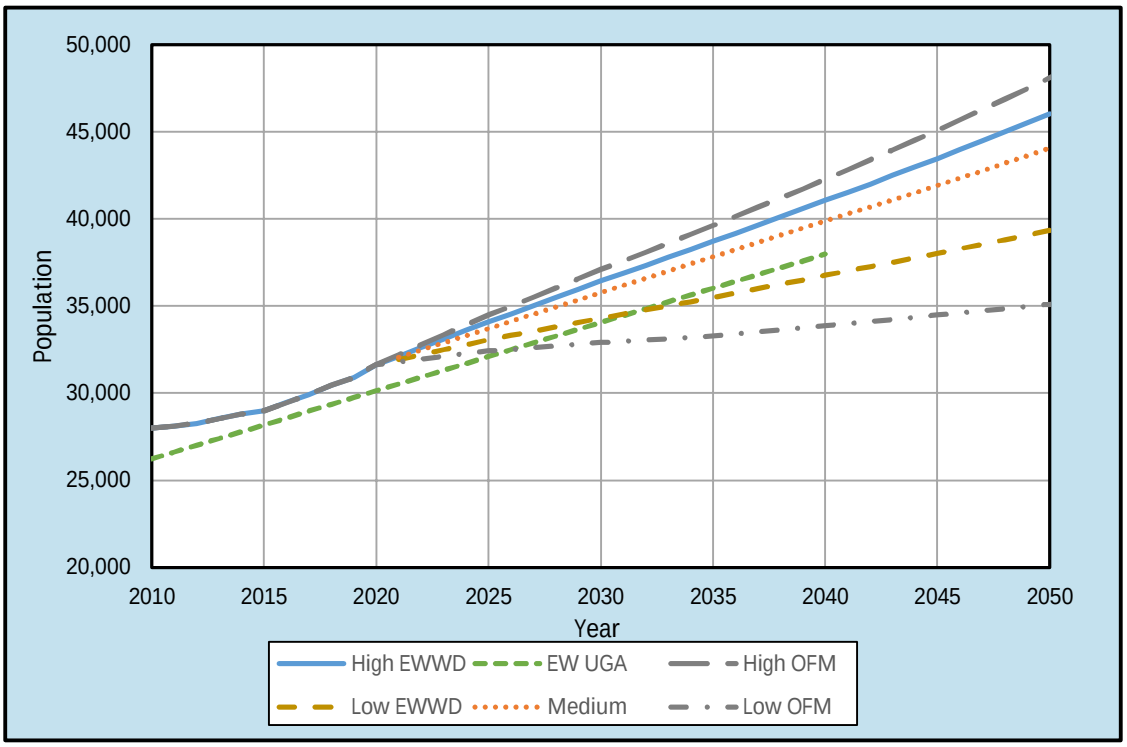
FUTURE WATER USE

The City of East Wenatchee estimates the population growth rate in the UGA will be between the medium and high rates from the OFM for the overall County, with annual growth starting at 1.30-percent in 2021 and steadily diminishing to 1.05-percent by 2040. For conservative infrastructure planning, this Plan assumes growth in the District will fall between this UGA rate and the OFM County overall high range rate. For conservative revenue planning this Plan assumes growth in the District will fall between this UGA rate and the OFM County overall low range rate. Published forecasts from the OFM and City currently end in 2040. Past 2040, 1.0-percent annual growth is assumed for the medium estimate. The results are shown on Table 1.1 and Chart 1.1.

Table 0.1 - Population Forecasts

	2021	2027	2031	2036	2041	2046	2051
Low Estimate (for revenue forecast)	31,925	33,561	34,541	35,740	37,011	38,281	39,595
Avg. Growth Rate	1.62%	0.84%	0.73%	0.68%	0.70%	0.68%	0.68%
Medium Estimate	32,063	34,532	36,179	38,237	40,282	42,336	44,496
Avg. Growth Rate	1.71%	1.24%	1.18%	1.11%	1.05%	1.00%	1.00%
High Estimate (for capital planning)	32,133	35,020	36,872	39,176	41,535	43,979	46,567
Avg. Growth Rate	1.76%	1.44%	1.31%	1.22%	1.18%	1.15%	1.15%
East Wenatchee UGA	30,532	32,884	34,452	36,412	38,375		
Avg. Growth Rate	1.34%	1.24%	1.18%	1.11%	1.06%		

Chart 0.1 - Population Forecasts



The future water use forecasts are shown on Table 1.2.

Table 0.2 - Future High Range Demand Forecast

Pressure Zone	Existing (2020)				2027				2031			
	WDD gpd	ADD gpd	MDD gpd	PHD gpm	WDD gpd	ADD gpd	MDD gpd	PHD gpm	WDD gpd	ADD gpd	MDD gpd	PHD gpm
965-N	84,848	115,824	233,823	500	103,938	142,049	296,180	633	120,107	163,771	348,158	746
965-S	1,046,541	1,325,049	1,990,677	2,254	1,055,795	1,349,735	2,035,011	2,452	1,059,073	1,367,315	2,095,175	2,647
1170/1292	1,052,298	1,349,961	2,225,744	2,472	1,091,145	1,419,569	2,356,181	2,866	1,128,079	1,462,407	2,446,451	3,115
1235/1494	282,978	375,347	656,226	740	389,198	603,016	1,133,029	1,305	516,361	899,502	1,774,366	2,110
1594	96,416	374,838	950,406	2,192	117,465	436,234	1,134,588	2,540	129,059	470,257	1,240,830	2,799
1768	44,833	123,999	309,346	690	43,815	121,774	305,531	677	43,881	122,049	307,612	693
Total	2,607,914	3,665,018	6,366,222	8,847	2,801,355	4,072,376	7,260,520	10,473	2,996,559	4,485,302	8,212,593	12,110
Pressure Zone	2036				2041				Full Buildout			
	WDD gpd	ADD gpd	MDD gpd	PHD gpm	WDD gpd	ADD gpd	MDD gpd	PHD gpm	WDD gpd	ADD gpd	MDD gpd	PHD gpm
965-N	135,200	185,588	413,050	800	137,323	189,178	444,694	815	582,499	833,280	1,577,998	2,826
965-S	1,062,567	1,388,103	2,167,557	2,889	1,066,431	1,409,432	2,240,887	3,137	1,314,233	1,892,521	3,276,871	5,333
1170/1292	1,159,548	1,513,868	2,555,441	3,424	1,191,387	1,565,911	2,665,644	3,740	1,857,912	2,594,207	4,530,071	7,458
1235/1494	715,683	1,465,968	2,948,424	3,647	744,054	1,563,171	3,029,356	5,186	3,275,212	4,975,385	8,218,523	14,543
1594	143,113	511,458	1,369,852	3,122	157,248	552,928	1,499,837	3,452	665,263	1,843,251	4,670,959	10,176
1768	43,954	122,362	310,101	713	44,054	122,747	312,774	733	58,839	163,604	399,433	947
Total	3,260,065	5,187,347	9,764,424	14,594	3,340,495	5,403,366	10,193,191	17,063	7,753,957	12,302,248	22,673,855	41,284

WDD = Winter Day Demand

ADD = Average Day Demand

MDD = Maximum Day Demand

PHD = Peak Hour Demand

DISTRIBUTION SYSTEM LEAKAGE

Unbilled water must be accounted for in demand planning. There are multiple sources of unbilled water in the District water system.

- Construction Flushing: Hydrant meters are used for flushing new watermains whenever practical but flushing occasionally occurs without using a hydrant meter. In these cases, the District estimates the water used.
- Public Works: Water used by the City of East Wenatchee and County primarily for street cleaning.
- Sewer Department: Water used by the Douglas County Sewer District primarily to clean sewer lines.
- Water Quality Flushing: Water used by the District to flush dead-end pipes to maintain water quality. Some of this flushing is metered, the rest is estimated.
- District Meters: Water used by the District primarily for irrigation of District facility sites.
- Leaks: Leaks within the system.
- Fire Department: Water used by the Fire Department for fire suppression and hydrant testing. The Fire Dept. briefly operates all hydrants annually and tests all new hydrants thoroughly. For estimating, annual tests assume 200 gallons per hydrant, and new hydrant tests use 3,000 gallons each.
- Failed Meters: About 3-percent of customer meters fail and are replaced each year.

The amount of time before a customer meter failure is identified and the meter is replaced can vary. 3 months is minimum due to the bi-monthly billing cycle, while 5 months is usually the longest. For estimating, a 4-month average is assumed. The estimated amount of water used during this period is based on the meter size and the annual average use of all customers for that meter size.

- 5/8” Meter = 200 gpd
- 1” Meter = 500 gpd
- 1.5” Meter = 800 gpd
- 2” Meter = 2,000 gpd
- 3” Meter = 6,000 gpd
- 4” Meter = 10,000 gpd

When a high-usage customer’s meter fails, the District will typically estimate unmetered water based on past billings.

The summary of estimated authorized consumption and DSL is presented in Table 1.3.

Table 0.3 - Distribution System Leakage (gallons)

	2014	2015	2016	2017	2018	2019	2020
Supply	1,249,078,000	1,323,029,791	1,268,334,188	1,292,178,214	1,299,487,236	1,281,701,800	1,337,632,681
Customer Sales	1,112,813,812	1,131,065,760	1,092,352,272	1,085,137,812	1,090,367,828	1,076,177,894	1,171,658,224
Hydrant Meter Sales	7,149,040	11,456,368	7,471,974	8,236,451	12,026,986	23,826,062	15,526,252
Construction Flushing	229,437	739,229	174,238	358,874	170,824	295,181	3,221,787
Meter Failures	12,466,004	14,578,136	15,692,280	16,241,744	28,918,692	9,765,792	5,568,000
Fire Fighting	120,000	120,000	142,500	150,000	112,500	135,000	82,500
Hydrant Testing	236,000	234,000	247,000	250,000	253,000	256,000	259,000
Maintenance Flushing	82,000	4,962,980	86,493	282,000	582,000	605,600	185,137
Fill Station	735,020	562,750	438,970	288,550	384,750	559,370	698,010
DSL	*115,246,687*	*159,310,568*	*151,728,461*	*181,232,783*	*166,670,656*	*170,080,901*	*140,433,771*
Percentage	9.2%	12.0%	12.0%	14.0%	12.8%	13.3%	10.5%
3 Year Average	12.5%	12.3%	11.1%	12.7%	12.9%	13.4%	12.2%

DSL over the last few years appears to have been misreported due to a small number of data entry errors that had large repercussions. Primarily these were transcription errors where decimal points were misread as commas.

An estimation was made of DSL by pressure zone. Where data is not readily available for the precise location of some authorized uses (meter failures, hydrant meter sales, etc.) the geographical distribution has been estimated. The results are shown in Table 1.4.

Table 0.4 - DSL by Pressure Zone (2017-2019 Average)

Pressure Zone	DSL Within Zone	DSL of Overall System	Steel Main Length (ft)
965-N (Est)	1.5%	0.5%	750
965-S	14.8%	45.6%	145,894
1170	13.5%	19.1%	63,869
1235	20.9%	0.7%	4,420
1292	13.5%	20.4%	68,196
1493	20.9%	12.7%	81,879
1594	0.9%	0.6%	0
1768	1.5%	0.3%	0

About 35-percent of the distribution mains are steel and many are known to be in poor condition. Many older customer services are galvanized steel, also often in poor conditions. As expected, the proportion of DSL tracks proportionally with the distribution of steel pipes.

DSL in the 1594 and 1768 Zones is statistically insignificant, which is to be expected as all water mains in those zones are ductile iron and all customer service lines are HDPE or copper. SCADA data recording issues have made it impractical to calculate DSL in the 965-N Zone, though it is expected to be similar to the 1594 and 1768 Zones because the mains and services are also almost entirely DI and HDPE respectively.

Assuming that the majority of DSL is leakage and not other unauthorized uses such as theft, the amount of DSL should be relatively consistent throughout the year.

RESULTS OF PAST CONSERVATION EFFORTS

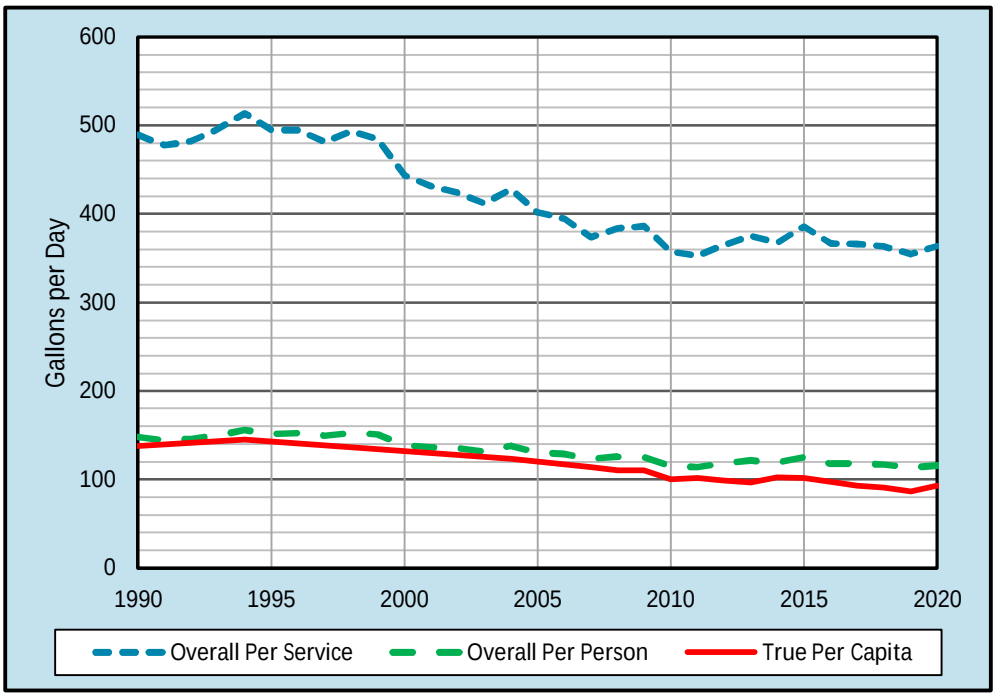
Table 1.5 shows water usage since 1990. Total pumped water is compared to the number of water service connections and population to obtain an average water supply per each. Both metrics show an average annual reduction of over 1-percent from 2000 to 2020.

Table 0.5 – Past Conservation Performance

Year	No. of Services	Population	Annual Supply (gal)	Per Service		Per Person	
				gpd	Reduction	gpd	Reduction
1990	5,649	18,643	1,008,186,000	489		148	
1991	5,751	19,052	1,001,955,900	477	2.4%	144	2.8%
1992	5,892	19,461	1,036,862,700	482	-1.0%	146	-1.3%
1993	6,012	19,870	1,088,261,900	496	-2.9%	150	-2.8%
1994	6,154	20,279	1,153,566,200	514	-3.6%	156	-3.9%
1995	6,339	20,688	1,144,547,000	495	3.7%	152	2.7%
1996	6,503	21,097	1,173,656,000	494	0.0%	152	-0.6%
1997	6,683	21,506	1,174,199,000	481	2.6%	150	1.9%
1998	6,766	21,915	1,217,774,000	493	-2.4%	152	-1.8%
1999	6,951	22,324	1,230,116,000	485	1.7%	151	0.8%
2000	7,124	22,734	1,153,162,000	443	8.5%	139	7.9%
2001	7,277	23,000	1,145,310,000	431	2.8%	136	1.8%
2002	7,412	23,152	1,145,872,000	424	1.8%	136	0.6%
2003	7,587	23,738	1,140,539,000	412	2.8%	132	2.9%
2004	7,785	24,130	1,216,081,302	428	-3.9%	138	-4.9%
2005	7,994	24,609	1,172,514,000	402	6.1%	131	5.5%
2006	8,298	25,458	1,194,903,000	395	1.8%	129	1.5%
2007	8,634	26,163	1,177,065,000	374	5.3%	123	4.1%
2008	8,830	26,915	1,235,899,000	383	-2.7%	126	-2.1%
2009	8,954	27,596	1,261,905,000	386	-0.7%	125	0.4%
2010	9,030	27,985	1,177,936,000	357	7.4%	115	8.0%
2011	9,091	28,126	1,170,219,000	353	1.3%	114	1.2%
2012	9,153	28,268	1,218,790,303	365	-3.4%	118	-3.6%
2013	9,230	28,526	1,263,973,463	375	-2.8%	121	-2.8%
2014	9,318	28,801	1,249,078,000	367	2.1%	119	2.1%
2015	9,399	28,995	1,323,029,791	386	-5.0%	125	-5.2%
2016	9,481	29,455	1,268,334,188	367	5.0%	118	5.6%
2017	9,674	29,915	1,292,178,214	366	0.2%	118	-0.3%
2018	9,794	30,457	1,299,487,236	364	0.7%	117	1.2%
2019	9,912	30,887	1,281,701,800	354	2.5%	114	2.7%
2020	10,077	31,651	1,337,632,681	364	-2.7%	116	-1.8%
		20 Year Average Annual Reduction			*1.3%*		*1.2%*

This data is displayed graphically on Chart 1.2.

Chart 0.2 – Past Conservation Performance



Since 1990, the total reduction has been 28-percent overall per person and 34-percent overall per connection. However, since 2010 these overall unit consumption values have remained relatively unchanged. This is primarily due to industrial water use which has increased from 1-percent to 8-percent of all sales since 2010. To account for this, also included on Chart 1.2 are the true per capita values which do not include DSL or industrial water use because those consumptive values are not related nor proportional to the population. True per capita consumption has reduced by 48-percent since 1990 and 9-percent since 2010.

The District conservation goals in 2014 compared to the results are as follows:

1) To reduce DSL by 0.5 percent.
   a) This goal has not quite been achieved. The three-year average in 2014 was 12.5 percent and currently is 12.2 percent.
2) To reduce per capita water use by 1 to 2-percent (total over 6 years).
   a) This goal has been exceeded, with a true per capita reduction from 103 gpd in 2014 to 93 gpd in 2020, a 10-percent reduction. Overall per service and overall per person consumption have averaged about 0.5-percent annual reduction since 2014.
3) To promote public education and awareness of water conservation issues.
   a) The District continues this endeavor.

CURRENT CONSERVATION PROGRAM

PUBLIC EDUCATION

The District has developed a promotional program, which will publicize the needs and methods for achieving water conservation in the community. The District has used radio to inform its customers

of the importance of water conservation and has also given out free indoor water conservation kits to its customers.

Radio news, newspaper articles, and other publications have been used to quickly inform a wide audience of impending or current water resource shortages or system failures.

The conservation program seeks to publicize the need for promoting efficient indoor and outdoor water usage through distribution of informational brochures or other printed materials that address methods of conservation. Pre-printed brochures are available from multiple sources, including Ecology, DOH, and American Water Works Association (AWWA). These are reviewed for their content, approach, and cost. Displays and informational packets are used as a method of disseminating conservation information throughout the community.

Promotion and public education are ongoing. Staff has given presentations at civic groups such as Rotary and Kiwanis, as well as at local schools and college.

Water conservation tips are provided in the District's annual Water Quality Report sent to all customers and available on the District's website.

Program Promotion

This conservation measure is a required element of all water conservation programs. The Conservation Planning Requirements provides the following definition for this measure.

> *Publicize the need for water conservation through television and radio public service announcements, news articles, public water systems' bill inserts, or other means. This includes promoting efficient indoor and outdoor water usage, distribution of Ecology/Health conservation brochures of other printed material, informing customers, builders and contractors of new plumbing code regulations requiring efficient plumbing fixtures and other efforts.*

The District includes conservation information in its annual report during the summer to educate customers about the methods and reasons for conserving water. Water conservation information can also be accessed by District customers via informational material located on the District and Chelan County Public Utility District No. 1 (PUD) websites. Other promotional methods used include newspaper articles, radio public service announcements, and displays at local fairs and mall shows. Other alternative approaches that are periodically considered include water-related conferences and seminars, community presentations, newsletters, conservation education courses for adults, and various conservation programs for the elementary, middle, and high schools.

The District has used the local media on numerous occasions to promote water conservation and will continue this effort in the future. The District will support the Regional conservation promotion activities of both the Chelan County PUD and the City of Wenatchee.

Theme Shows and Fairs

The District hosts a booth at local home shows to promote water use efficiency and answer customer questions.

TECHNICAL ASSISTANCE

Purveyor Assistance

The District continues to work with the Chelan County PUD and City of Wenatchee to discuss water conservation methods and programs. The District will promote discussions regarding cooperative planning, program development and purchasing.

Customer Assistance

The District provides assistance and information to customers to facilitate water conservation.

Customer assistance publications on water conservation practices are available at the District. The District currently has brochures available at the District's main office on the WUE standards for plumbing fixtures.

The District will commit the necessary budgetary resources to provide information to the customer, which facilitates water conservation. This element will be ongoing as long as it is shown to be cost effective.

Customer assistance is practiced regularly in the District. Most assistance revolves around troubleshooting unexpected or unusually high excess water use. Users who are interested in landscape management and xeriscape programs are directed to Chelan County PUD's website http://www.chelanpud.org/conservationhome/water-conservation/xeriscape.html, which provides information on plants and landscaping native to the area. This information is particularly valuable to residential homes that are built on lands without an irrigation water right.

SYSTEM MEASURES

Source Meters

A source master meter was installed when the District joined the Wenatchee Regional Water System in 2001. Each Regional backup well also has its own meter.

Metering Program

The District's policy is to require that all use and services for water shall be furnished with and measured by meter. The District implemented this policy many years ago by metering all water consumption that the District is aware of. District personnel periodically test installed meters and replace them if there is a problem. The District currently has a meter replacement program that replaces all meters on a 15-year cycle. Source water is metered at the Regional Supply Station.

Leak Detection

The amount of distribution system leakage (DSL) in the District system has averaged approximately 12 percent over the last several years. The District has leak detection equipment, which is used as needed to detect leaks in suspected areas. Leaks are repaired as discovered. The District has also used an outside company to evaluate areas of the system that they suspect may be leaking.

The District also has a data logger which it has used on customer service meters that records water use and time of day. If a customer has unusual water consumption, water use data can be recorded for a week and give the customer a printout and plot of water use for that period of time. It usually provides insight into when the consumption occurs and points to the problem, such as like a soft water machine that back flushes too long, an irrigation system running longer that assumed, a fire sprinkler system leaking, etc.

BILLING MEASURES

Conservation Pricing

Historically the District included 600 cubic feet of water in the base monthly water rate and billed bi-monthly. Water use exceeding the base allocation was billed on a uniform block rate per gallon. The District has recently completed a rate study and adopted a new rate system which now bills for all consumption at tiered rates. The tiered rate billing encourages the use of separate irrigation water and xeriscaping.

CONSERVATION GOALS AND PUBLIC PROCESS

WUE goals must be set through a public process and be evaluated and reestablished a minimum of every 6 years. Public hearings are typically scheduled with the District's Commissioner meetings, with the most recent held on January 6, 2016.

The District supports water conservation as a wise and efficient use of natural resources. The program presented here will include elements that improve source management and increase public awareness with the intent of reducing per capita water consumption. The objectives of this conservation program are:

1) To reduce the DSL volume by 1-percent (approximately 1.5 MG) per year.
   a) DSL is expected to be reduced primarily by replacing steel watermains and steel customer service lines.
2) Maintain or reduce per capita water use.
   a) While the District expects the newly implemented tiered rates and the County/City land use goals of smaller lots will both result in a reduction of per capita use, no numerical reduction goals are proposed other than to not increase use. The District's per capita consumption (93 gpd) is already significantly lower than those of the adjacent City of Wenatchee (133 gpd), Chelan County PUD (141 gpd), and City of Cashmere (119 gpd).
3) To promote public education and awareness of water conservation issues.

MANDATORY MEASURES

The following conservation measures are mandatory, and do not count towards the District's quota of other conservation measures.

Source of Supply Meter Readings

Requirement: Read meters daily. Record monthly and annual totals.

Compliance Status: Water supply to the District is currently provided by one metered supply point. Flow is recorded in real time through the SCADA system, with daily totals archived.

Customer Service Meters

Requirement:

a. Record monthly totals. Monthly totals may be estimated if water usage is billed less frequently.
b. Record usage for the following classes: single-family, multi-family, commercial, industrial, and public.

Compliance Status: Customer meters are read every other month. The District has grouped customers into several classes that meet the requirements stated above.

Meter Calibration

Requirement: Verify meter accuracy and repair or replace on a regular schedule.

Compliance Status: The source meter (full bore mag-meter style) was installed in 2001. All original propeller meters in each booster station have also been replaced with mag-meters. The District has no current reason to question the accuracy of any of these meters. Mag-meters have no moving parts, so they are less prone to loss of accuracy than mechanical meters. Typically, a failure is complete failure rather than a change in accuracy.

Customer meters are replaced when water use records become suspect. A 15-year replacement program for customer meters is in place. The District reviews water use on the large (3-inch and larger) customer meters and will replace with modern high accuracy meters when water use appears suspect.

Leak Detection

Requirement: Conduct periodic leak detection surveys until DSL is reduced to below 10 percent.

Compliance Status: The District regularly uses its own leak detection equipment.

Customer Education

Requirement: Provide customer education.

Compliance Status: Current customer education is described under the “Public Education,” and “Customer Assistance” paragraphs of the Current WUE Program Section. Formal forums have not been held.

Determine DSL Rate

Requirement: Record annual totals.

Compliance Status: Source and customer meters are totaled yearly, and authorized unmetered uses (firefighting, construction flushing, etc.) are estimated.

MEASURES TO BE EVALUATED OR IMPLEMENTED

Because the District exceeded 10,000 connections in 2020, at least 9 additional measures must be evaluated for applicability and cost-effectiveness.

The following measures are presented and evaluated for practicality and benefit. If a measure will not be implemented, it is evaluated on three bases: 1) the cost-effectiveness to the District; 2) the cost-effectiveness if costs are shared with other entities; and 3) the cost-effectiveness on a societal view. Measures that will be or are currently implemented do not include any further cost evaluation.

Cost Sharing Perspective

Except where specifically noted otherwise, cost sharing with other entities is considered ineffective. Education efforts typically have very low costs, and other measures are so geographically localized that coordinating with other entities would not increase efficiency or reduce costs. The District stays in constant contact with the City of Wenatchee and Chelan County PUD to discuss how each purveyors' approach to water use efficiency has fared.

Societal Perspective

The societal cost benefits of water use efficiency would be the same for any measure that reduces water use, and as such are not repeated in each section below. The efficient use of water can reduce electrical needs for pumping, improve instream flows (though for the capacious Regional Aquifer and Columbia River, this would not be measurable), and support both the perception and the reality that our resources are being used wisely.

WUE Measures

1) The District replaces steel mains where leaks have been identified. The District will commit the necessary budgetary resources through user fees to include these projects in the capital improvement program. This program is reviewed and updated at least annually.
2) The District has adopted a new rate system that will be implemented starting January 1, 2022.
    a) The rate system includes customer classes of Single-Family, Multi-Family, Commercial, Industrial, and Irrigation.
    b) Single Family rates are two tiered with higher unit cost for higher consumption.
    c) Other class rates are single tiered, but at a higher rate than Single Family.
3) Change to Monthly Billing

    The District has always billed customers every two months. Starting in 2022 bills will be sent monthly. The conservation benefit is that broken meters and private service leakage can be identified and fixed sooner.

    In 2020 alone, residential service leakage was estimated to be at least 7 MG. Monthly billing could reduce this amount by up to half.

    Since 2014, broken customer meters are estimated to have under-recorded from as low as 5 MG/year to as much as 29 MG/year. Monthly billing could reduce that value by up to half.

4) Ongoing Public Education for Single Family customers.
   a) Irrigation Water Use – New Construction

      The District reviews development and subdivision proposals for compliance with District standards. When land being developed is within an existing irrigation service area, the District will inform the proponent and encourage the use of separate irrigation water. The District has no jurisdiction to enforce the use of irrigation water, but will advise to the extent practical.

   b) Landscape Management

      Promote low water demand landscaping in all retail customer classes.

      The District has promoted low water use landscaping (xeriscape) by utilizing xeriscape techniques during modifications to the District's office, reservoir, and booster pump station projects. However, other than the information in the proposed brochures regarding low water use landscaping, the District does not plan to actively pursue a formal program of promotion of this type of landscaping. The District directs customers to the Chelan County PUD website, which provides information about xeriscaping.

5) Ongoing Public Education for Multi Family customers. See also item 3a and 3b.
6) Ongoing Public Education for Commercial/Industrial customers. See also item 3a and 3b.
7) Bill Showing Consumption History for Single Family customers:

   In 2009 the District updated their billing system so that bills now show water use over the same period from the previous year.

8) Bill Showing Consumption History for Multi Family customers:

   See description under item 6.

9) Bill Showing Consumption History for Commercial/Industrial customers:

   See description under item 6.

10) Irrigation Water Use – Existing Unserved Areas

    The Regional Water System purchased a large amount of irrigation water shares from the Pioneer Water Users Association in 2013. Some of these shares will be used for municipal water, but some are available for irrigation. The District has discussed with the Greater Wenatchee Irrigation District to evaluate if irrigation water can be supplied to the Fancher Heights area, which currently has no irrigation water. A significant amount of infrastructure will be required, but the water savings could be over 0.5 MG per day.

    Status: Not implemented, but the issue is reviewed every few years.

    Cost: At least 5 miles of transmission main may be required at an estimated cost of $5,000,000 to $8,000,000. A distribution system within the improved areas is much harder to estimate, but may cost between $3,000,000 and $6,000,000.

11) Review Bills for Abnormal Use for Single Family customers

    The District reviews billing trends and identifies individual customers whose usage increases dramatically. This can indicate a leak in a customer's private service.

Status: Implemented.

12) Review Bills for Abnormal Use for Multi Family customers.

See description under item 10.

13) Review Bills for Abnormal Use for Commercial/Industrial customers.

See description under item 10.

14) Supply Fixture Efficiency Kits to Customers on an Individual Basis

The District has both indoor and outdoor kits on hand. Documentation contained in the indoor kit states potential water savings of up to 130 gpd (47,000 gallons per year) per home.

15) Supply Fixture Efficiency Kits to All Existing Homes

New and remodeled residences in the District already need to comply with the water efficiency standards for plumbing fixtures.

Status: Not implemented.

Cost Evaluation: To purchase and distribute kits to retrofit fixtures of all older homes not meeting these standards would be cost prohibitive for the District. It appears that more can be accomplished in the program promotion measure by educating the public about ways to conserve water, including the new WUE standards for plumbing fixtures and devices they can install to improve the efficiency of their existing fixtures.

16) Install Real-time Customer Metering

The District is working with Sensus to implement a pilot study using their FlexNet system for about 850 customer smart meters in the 1593 and 1768 pressure zones. The system will monitor all customer use in real-time with the data readily available to both the customer and the District. This can indicate leaks immediately rather than waiting for bills to arrive and also allow the customer to make more educated decisions about their water use. Another benefit is reduced service trips to perform intermittent manual readings when homes are sold. Once fully implemented, drive-by meter reading will be almost fully eliminated.

Status: The District is ready to begin, but worldwide material shortages are preventing delivery of the equipment. The current best estimate is that equipment may arrive in spring of 2022.

Cost sharing: The technology is not expected to be more cost efficient with multiple agencies due to incompatible equipment and billing systems.

INVENTORY OF SOURCES FOR RECLAIMED WATER

Following is a list of potential sources of reclaimed water.

Treated Sanitary Sewage Outflow

The District has had conversations with the Douglas County Sewer District about using its discharge water as a potential source for reclaimed water. Currently, the wastewater plant does not provide tertiary treatment, which, by itself, could stop any proposed project financially if grant monies are not found. To make any use of this water, an entirely new pump and distribution system would have to be built. The closest potential customer base of any useful size is Fancher Heights, about

three miles from the treatment plant. As water resources become more limited, this issue will be looked at more closely in the future with the Douglas County Sewer District.

Excerpt from the 2004 Water Resource Inventory Area (*WRIA*) *44 and 50 Watershed Management Plan*:

> 1.2 Reclaimed Water Feasibility Assessment
>
> The Douglas County Sewer District Treatment Plant discharges about 3 million gallons per day of treated wastewater. This water could potentially be used for landscape irrigation for parks, cemeteries, and golf courses. Currently, the Sewer District does not have the facilities to treat the wastewater to the tertiary level, as required to protect public health and safety, and the tertiary treatment is cost prohibitive at this time compared to the benefits obtained. In the future, however, when the treatment plant is upgraded or a new plant is built, reclaimed water may become feasible.

Fish Hatcheries

The only fish hatchery near the District is at Rocky Reach Dam. The water is taken from wells in the same aquifer as the Regional water system, and then passed directly back into the Columbia River after going through the hatchery. Using the water as reclaimed water could potentially be difficult to gain acceptance from the Ecology as the rights may be non-consumptive or non-transferrable. At least 6 miles of transmission main and a pump station (estimated cost well over $10,000,000) would be needed just to reach the leading edge of the District customer base. New distribution would also be required from that point into the District.

Storm Water Impoundments

Although there are numerous storm-water impoundments within the District service area that are managed by the City of East Wenatchee and Douglas County, the minimal rainfall of 10 inches annually does not provide a useful volume. Also, the rain primarily occurs is in the winter and spring months when irrigation water is not needed.

POTENTIAL USES FOR RECLAIMED WATER

Industrial and Commercial

The industrial users have been informed that, if the water lost in their operations is supplied through their water meter, many are paying sewer charges on that water even though it may not be discharged to the sanitary sewer system because sewer charges are based on the water meter readings. These businesses have been encouraged to utilize their non-contact cooling water in some other aspect of their operation. Floor cleaning, landscape irrigation, and non-treated float tanks are potential recycling uses for non-contact cooling water.

Landscape Irrigation

This could include public parks, nurseries, and golf courses. The effluent from the Douglas County Sewer District wastewater treatment plant is the only nearby source of sufficient volumes to be used for irrigation. However, to protect public health and safety, treatment of the wastewater used

for irrigation would need to be improved to the tertiary level. Tertiary treatment is estimated to be cost prohibitive at this time compared to the benefits obtained.

The closest park to the wastewater treatment plant is a very small City of East Wenatchee park at the north end of Valley Mall Parkway, approximately 2,000 feet north of the plant. This is estimated to be cost prohibitive for the benefits obtained.

All golf course, schools, and large landscape areas within the District are currently served via irrigation water from either Greater Wenatchee Reclamation District or the Wenatchee Reclamation District. So, converting them to a water reclamation source does not provide any water conservation savings through the District's water system.

CONSERVATION PROGRAM MONITORING

The District will continue to monitor overall water use, per-capita water use, and the amount of DSL on an annual basis. The District will monitor the success or failure of its water conservation program by analyzing this data and determining the long-term trend in per-capita water usage. If the results of the program monitoring show that the water savings' goals for per-capita water use are not being met, more rigorous program implementation or additional program items will be considered.

Evaluation of the implemented measures will be made based on the criteria in Table 1.6.

Table 0.6 – Conservation Monitoring

Category or Measures Implemented	Economic Incentive Promoted	Monitoring Technique	Impact to Water (S)upply or Customer (D)emand	Impact to (C)ommercial, (R)esidential, or (I)ndustrial Customer	Measure Reduces (P)eak Demand or (O)verall Demand
Tiered Billing	Yes	Tabulate Annual Per Customer and Per Capita Consumption	D	C, R, I	P, O
Steel Main Replacement	No	Track Annual Pipe Length Replaced and Leaks Repaired	S	N/A	P, O
Public Outreach	N/A	Track Brochures Distributed, Presentations, and Outreach	D	R	P, O
Program Promotion	N/A	Track Brochures Distributed, Presentations, and Outreach	D	C, R, I	P, O
Purveyor Assistance	N/A	Review Impacts with Other Utilities and Monitor Customer Feedback	D	C, R, I	P, O
Customer Assistance	N/A	Track Number of Customers and Material Delivered	D	C, R, I	P, O
Source Meters	N/A	Monitor Meter Accuracy	S	N/A	P, O
Service Meters	No	Monitor Meter Accuracy	D	C, R, I	O
Unaccounted for Water / Leak Detection	No	Annual Evaluation of Water Loss	S	C, R, I	O

WATER LOSS ACTION PLAN

The District's DSL is estimated to be just over 12 percent. The District crew has always spent part of their time repairing leaks. But by 2010 the leaks were becoming so numerous that the crew was spending nearly all of their time on repairs. Most leaks are in steel mains that are unlined or uncoated, steel customer service lines, and copper customer service lines. Even many lined and coated steel mains leak where the coatings have been damaged.

In response, the District developed a program in 2014 to replace the 80 miles of steel pipelines. The high cost of the program encouraged the District to contract with a financial firm to perform a rate study and develop a funding plan. A rate increase was enacted, but rather than wait for the increase to slowly build the reserves, a bond sale was conducted in 2016 to provide immediate funding to start the program. From 2016 to 2021, the District replaced approximately 8 miles of old mains. When new mains are installed, old customer service lines are replaced using HDPE.

When new private development occurs adjacent to a steel main, the District determines if the main needs to be replaced (upsized) to serve the hydraulic needs of the development. The District also evaluates if the development improvements may cause the existing main to leak, such as

performing vibratory compaction directly above it. If either case is true, the District requires the developer to replace the steel main.

The District intends to continue these programs until all steel mains and metal customer service lines are replaced. The estimated 67 miles of remaining steel mains may take another 40 to 50 years to replace.

The steel mains are estimated to leak by 300 gallons per year per foot of pipe, gross average. Replacement of 1.5 miles per year (combined between District and developers) may reduce DSL by 2.4 MG, or about 1.7-percent annually of all DSL. Based on this assumption, reducing DSL from 12-percent to 10-percent (approximate 23 MG reduction) may take another 10 years.

The District funds their steel main replacement program at $1,500,000 to $2,000,000 per year. To maximize these funds, the District coordinates with the City and County to replace mains in conjunction with street projects. This reduces the District's cost for pavement restoration and reduces the disruption to the public by not having the same road under construction multiple times.