

9. WATER USE EFFICIENCY

WAC 246-290-810 requires that water system plans and small water system management programs must describe the municipal water supplier's existing Water Use Efficiency (WUE) Program. The municipal water supplier must continue existing levels of water use efficiency.

9.1. Metering Requirements

9.1.1. Source Meters

WAC 246-290-496(1) requires that systems measure the volume of water produced or purchased using a source meter or other meter installed upstream of the distribution system. The requirements of this section of the WAC do not apply to volumes of water delivered to a public water system through an emergency intertie; however, interties used as permanent or seasonal sources must have meters.

Millwood currently meters production at the City's source of supply.

9.1.2. Consumption Meters

WAC 246-290-496(2) requires systems to measure the volume of water delivered to consumers by installing meters on all direct service connections. Systems may serve certain clustered entities through a single meter (e.g. campgrounds, RV parks, mobile home parks, buildings with multiple units, and complexes with multiple buildings served as a single connection).

Millwood currently meters all service connections.

As required by WAC 246-290-496(3), the City selects, installs, operates, calibrates, and maintains customer service meters according to generally accepted industry standards and information from the manufacturer.

9.2. Data Collection

The Water Use Efficiency (WUE) Rule requires systems to collect production and consumption data on a regular basis and report that information in the annual performance report. Water production and consumption data has numerous uses including: calculating system leakage, forecasting demand, identifying areas for more efficient use of water, and evaluating the effectiveness of the WUE program.

9.2.1. Source and Service Meter Data

The City collects and records daily totals from all source meters; service meter data is collected and recorded on a monthly basis. The City uses this data to calculate distribution system losses. Refer to **Sections 3.1.3** and **3.1.4** for the City's source and service meter data.

9.3. Water Supply Characteristics

9.3.1. Ground Water Supply – Old Park, New Park, and Butler Wells

All of Millwood's wells withdraw water from the Spokane-Rathdrum Aquifer. See **Table 2-1** for source capacities and information. See **Section 5.2** for a discussion regarding supply capacity and demand.

9.4. Current WUE Program

The City's existing WUE program seeks to gradually and permanently reduce average per-capita demand. Short-term voluntary or mandatory reductions in water use to overcome temporary water shortages associated with drought, transmission line failures, or emergency conditions are not considered elements of a WUE program. Rather, WUE program elements constitute a long-term voluntary reduction in customer demand through education, improved technology, and water rate structure. Customers are educated annually on how to use water efficiently through the use of information contained in the City's yearly consumer confidence report.

As a part of the existing WUE program the City trains employees to perform water use efficiency oriented public outreach in the normal course of their duties.

9.4.1. Estimated Conservation Savings to Date

The City's 2003 WSP calculated the City's ERU usage at 620 gpd/ERU. As shown in Section 3.1.5 the City has reduced ERU usage to 502 gpd/ERU. Millwood has saved approximately 118 gpd/ERU.

9.5. Goal Setting and the Public Forum

One of the most important steps in achieving efficient water use is setting goals that can be measured. The Water Use Efficiency Rule requires systems to set goals through a public process. Involving the public allows water users to understand the characteristics and future needs of the City's system and to set a reasonable, attainable goal.

9.5.1. WUE Goals

In June of 2011, Millwood established the following WUE goals:

Supply Side Goal: reduce distribution system leakage to 10% over the effective period of this water system plan.

Demand Side Goal: reduce water use by 1% annually over the effective period of this water system plan.

9.5.2. Public Forum for Establishing WUE Goal

The Water Use Efficiency Rule requires that systems allow customers and interested members of the public to participate in the goal setting process through a public forum. This allows the public an opportunity to provide input on the decisions and it helps customers to understand the need to use water more efficiently and how they can help achieve the WUE goal.

The City conducts public forums when establishing or revising the WUE goals in accordance with the requirements of WAC 246-290-830(4). See the **Appendix** for WUE related items.

9.6. Evaluation of WUE Measures

9.6.1. Required Number of WUE Measures

The City serves approximately 765 connections. The following Table contains the number of measures systems must either implement or evaluate for cost effectiveness based on the number of connections served. The City must either implement or evaluate for cost effectiveness at least four measures.

Table 9-1 Required Number of WUE Measures

Number of Connections	Less than 500	500 – 999	1,000 – 2,499	2,500 – 9,999	10,000 – 49,999	50,000 or more
Number of WUE Measures Required	1	4	5	6	9	12

9.6.2. WUE Measures Evaluated and Implemented

The following Sections list the WUE measures evaluated by the City. Each section contains a description of the measure, whether or not the City chose to implement the measure, and an analysis of the measure’s cost efficacy (if not implemented).

9.6.2.1. Measure #1: Rates that Encourage Efficiency

Currently the City allows 4,000 cu ft in its base rate. Millwood plans to implement a new rate structure that reduces the allowable quantity included in the base rate while simultaneously increasing rates. The City chooses to implement the new rate structure during the Fall of 2011. It is difficult to estimate water saving from this measure however it will contribute to achieving the City’s WUE goal.

9.6.2.2. Measure #2: Irrigation Conservation Information Kits

The City will provide information and simple tools such as rains sensors to consumers. The City chooses to implement this measure to help achieve the WUE goal. It is difficult to estimate water saving from this measure however it will contribute to achieving the City’s WUE goal.

9.6.2.3. Measure #3: Consumer Rebates for Efficient Appliances

The City chooses to implement a consumer rebate program for installing water efficient fixtures or appliances. It is difficult to estimate water saving from this measure however it will contribute to achieving the City’s WUE goal.

9.6.2.4. Measure #4: Pump Pre-Lube Controls

The City chooses to eliminate the continuous pre-lube loop in each of its well pump stations. The City estimates it will save approximately 31 million gallons per year.

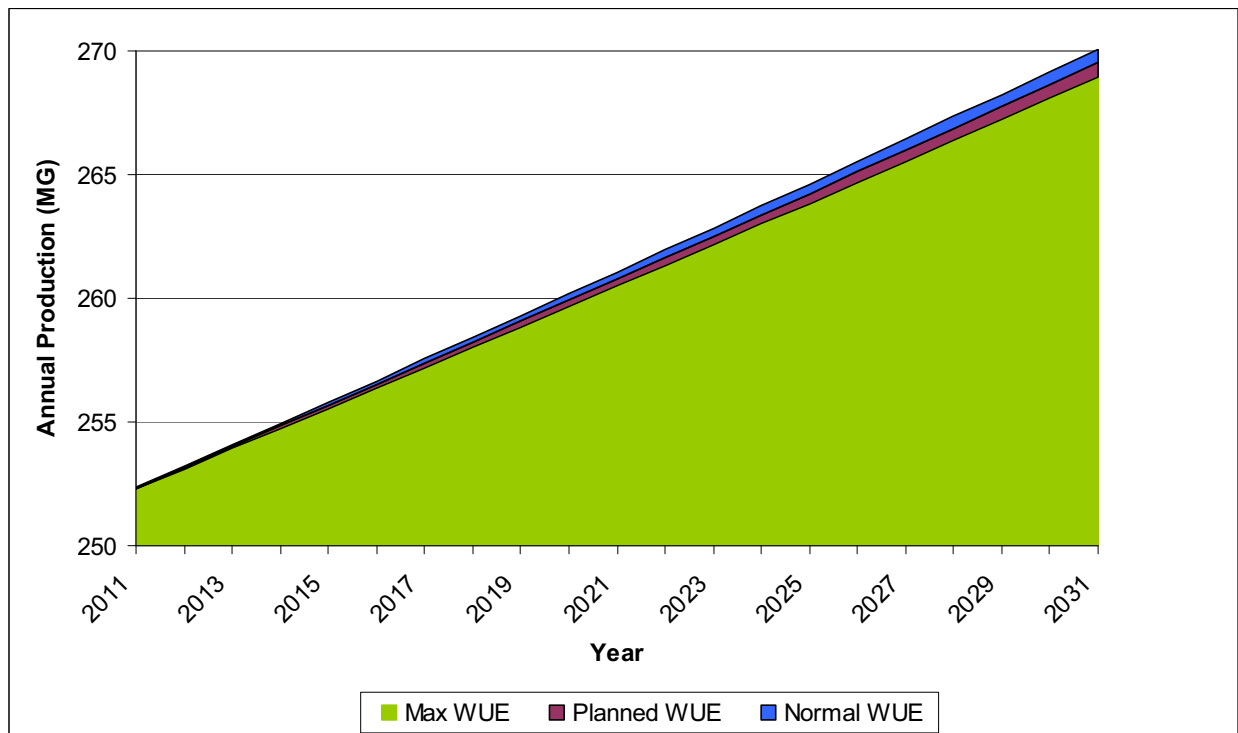
9.7. Evaluating Efficacy of WUE Measures

The City will monitor total system annual water use and average customer water use to determine whether WUE measures reduce actual water use.

9.8. Demand Forecasting – Projected Conservation

The Demand projections developed in **Section 3** do not take into account WUE efforts that might reduce future demand. The City projects total water use to increase 0.32% annually without WUE. With planned WUE measures the City believes it possible to reduce annual water use growth to .31%. If the City implemented all available WUE measures annual growth could conceivably reduce to .30%. The figure following illustrates potential water savings due to more efficient use of water.

Figure 9-2 Projected Water Use with WUE



The City plans to review water consumption annually to determine success of WUE efforts. The City also plans to review its WUE program annually to evaluate future water saving targets, and assess program benefits versus costs.

9.9. Distribution System Leakage Standard

The Water Use Efficiency Rule divides system water use into two categories: authorized consumption and distribution system leakage (DSL). DOH defines authorized consumption as the volume of water authorized for use by the water system. In addition to normal water sales metering records, systems can track and estimate other types of authorized water uses such as:

- Maintenance flushing of the water system
- Fire fighting and hydrant testing
- Cleaning of water tanks or reservoirs
- Street cleaning

DOH considers DSL all water use not authorized by a water system; this includes both apparent losses and real losses such as:

- Leakage
- Theft
- Meter inaccuracies
- Meter reading errors
- Data collection errors
- Calculation errors
- Water main breaks

The City calculates DSL by comparing source production meters with water sales from customer meters. **Table 3-2** contains the Millwoods's current calculated DSL. The City's three year average DSL is estimated to be approximately 20% (see **Section 3**). The high distribution system leakage is likely due to deteriorated cast iron pipe however, City staff recently discovered a meter reading error that reduced its previous DSL number by about 15%.

9.10. Water Loss Control Action Plan

The City is currently assessing its data accuracy and collection methods to identify any further errors.

9.11. Evaluation of Conservation Oriented Rate Structure

An inclining block type rate structure encourages conservation by directly linking a customer's increased consumption to higher water bills. Implementing an inclining block rate structure is relatively simple and inexpensive (to the water system) to implement. The City utilizes an inclining block rate structure for all of its customers (refer to **Section 8**); this encourages conservation. However, customers receive a large base allotment (4,000 CF) so rate blocks have likely have little or no effect on conservation. Reducing the base allotment volume would further orient the City's water rates towards conserving water.

9.12. Water Shortage Response Plan

With three sources, one reservoir, two booster stations, and three interties connected to the system, the City's water supply is relatively secure. Nevertheless, there are conceivable circumstances under which the City would need to respond to short-term or long-term water shortages. The plans for responding to such an incident are delineated in the following paragraphs.

The likely duration of the water shortage, which sources are affected and the time of year the shortage occurs largely determine which response steps are required.

The City has high redundancy. Nevertheless, there could come a time when severe water use reductions would be needed. The following table lays out the water shortage response plan.

Table 9-3 Water Shortage Response Plan

Stage 1 Minor Shortage Voluntary Measures 5% – 10% reduction goal	Stage 2 Moderate Shortage Mandatory Program 10% – 20% reduction goal	Stage 3 Severe Shortage Rationing Program 20% – 30% reduction goal
A. PUBLIC INFORMATION ACTIONS		
<ul style="list-style-type: none"> - Prepare & distribute water conservation materials (bill insert, etc.) - Prepare & disseminate technical conservation information to specific customer types - Coordinate media outreach program - Issue news releases to the media 	<ul style="list-style-type: none"> - Continue public information program 	<ul style="list-style-type: none"> - Continue public information program
B. GOVERNMENT ACTIONS		
<ul style="list-style-type: none"> - Increase enforcement of hydrant opening - Increase meter reading frequency & meter maintenance - Promote intensive leak detection & repair program - Draft & adopt ordinances banning water waste. A typical ordinance could require: <ul style="list-style-type: none"> ▪ No unfixed leaks; ▪ No hosing of paved surfaces; ▪ No fountains except those using re-circulated water; ▪ No water running onto streets; ▪ No watering during the middle of the day; and ▪ No irrigation runoff - Draft & adopt ordinances allowing City to declare a water emergency and require fixed consumption allotments or % cutbacks (rationing) 	<ul style="list-style-type: none"> - Reduce water usage for main flushing, street cleaning, public fountains, & park irrigation - Watering of parks, cemeteries, etc., restricted to nights or designated irrigation days 	<ul style="list-style-type: none"> - All public water uses not required for health or safety prohibited unless using tank truck water supplies or reclaimed wastewater - Irrigation of public parks, cemeteries, etc., severely restricted - Pool covers required for all municipal pools - Main flushing allowed only for emergency purposes
C. USER RESTRICTIONS		
<ul style="list-style-type: none"> - Implement voluntary water use reductions (see A. Stage 1) 	<ul style="list-style-type: none"> - Implement ordinance banning water waste (See B. Stage 1 above) - Adopt landscape irrigation restrictions incorporating one or more of the following: <ul style="list-style-type: none"> ▪ Time of day (e.g., 7 pm to 7 am) ▪ Weekly frequency (e.g., odd/even, time per week) ▪ Sprinkler bans (e.g., hand) - Commercial car washes should intensify voluntary use reductions - Golf course irrigation times and weekly watering limits reduced 	<ul style="list-style-type: none"> - Implement ordinance allowing utilities to declare a water emergency & to require rationing (see B. Stage 1) - Car washing permitted only during specified watering hours of designated irrigation days - Times of day restrictions applied to commercial car washes - Golf course watering times & weekly watering limits reduced - Permissible watering hours & weekly frequency for landscaping irrigation further reduced
D. PENALTIES		
<ul style="list-style-type: none"> - None 	<ul style="list-style-type: none"> - Warning - House call - Shut off and reconnection fee 	<ul style="list-style-type: none"> - Fines
E. PRICING		
<ul style="list-style-type: none"> - None 	<ul style="list-style-type: none"> - Impose surcharges 	<ul style="list-style-type: none"> - Impose surcharges

The City Council has the necessary authority to implement the above measures at such time as they are required.