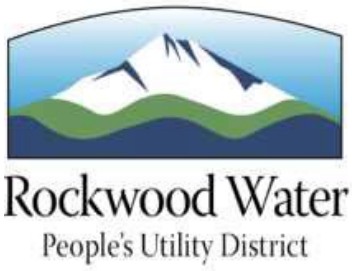
Final

Water Management and Conservation Plan

Rockwood Water People's Utility District and City of Gresham, Oregon



August 2023

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Appendices

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1. Municipal Water Supplier Plan Elements

This section satisfies the requirements of Oregon Administrative Rules (OAR) 690-086-0125.

This rule requires a list of affected local governments to whom the plan was made available, and a proposed date for submittal of an updated plan.

1.1 Introduction

The goal of this Water Management and Conservation Plan (WMCP or Plan) is to describe the water management and conservation policies, programs, and practices that ensure long-term sustainable water use for the Rockwood Water People's Utility District (District or Rockwood) and the City of Gresham (City or Gresham).

The District was officially formed in 1925 as the Rockwood Water District and developed its first public supply well in 1926. In addition to the Cascade groundwater system, which is jointly owned and operated by the District and City, the District relies on wholesale water purchases from the Portland Water Bureau (PWB). Rockwood has contracted with PWB since 1943 for this water supply. PWB's water sources include the Bull Run watershed and the Columbia South Shore well field. In 1990, the District became the Rockwood Water People's Utility District through a vote of District service area residents. The service area encompasses approximately 10 square miles within the cities of Portland, Gresham, and Fairview and in 2021 served a population of 66,397, making it one of the larger water providers in the state.

The City of Gresham was incorporated in 1905. It is one of the largest service areas in Oregon based on the population served. The City provides water service to a population of 75,483. The City owns and operates a public water system that supplies potable water to approximately two-thirds of City residents. Over the past 20 years, Gresham has grown from a rural agricultural community to a thriving, diverse urban area. The City's current water sources include wholesale water from PWB (Bull Run watershed surface water and/or groundwater from the Columbia South Shore well field) and groundwater from the Cascade groundwater system, which the City jointly owns with the District.

The current wholesale contracts the District and City have with PWB will expire on June 30, 2026. The cost of wholesale water under a renewed contract is anticipated to be significantly higher to cover the costs of a new treatment facility. (New treatment is required for surface water from the Bull Run watershed to comply with federal regulations to protect consumers from microbial pathogens.) In response, neither entity sought to extend the wholesale water contract with PWB. In place of the PWB source of supply, the District and City will transition to the use of groundwater as their sole source of water supply by 2026. The District and City are currently expanding the jointly held Cascade groundwater system, which is comprised of three wells and transmission and distribution systems and will eventually include three water treatment plants and additional wells and inline reservoirs. This WMCP describes the District's and City's current and near-term water supply (through 2026), including the use of both groundwater and

purchased wholesale water from PWB, and their future water supply (from 2026 onward) using only groundwater.

1.2 Plan Requirement

On April 10, 2012, the Oregon Water Resources Department (OWRD) issued a final order approving the District's application for an extension of time for Permit G-8719 to October 1, 2047. The extension included a condition limiting appropriation of groundwater under the permit to 4.42 cubic feet per second (cfs) until additional access to water under the permit is authorized by a final order approving the District's WMCP.

On August 16, 2013, OWRD issued a final order approving the District's and City's first joint WMCP and authorizing the appropriation of up to 33.5 cfs under Permit G-16917. The final order requires the submittal of an updated WMCP by February 12, 2023.

1.3 Plan Organization

This WMCP fulfills the requirements of the OAR adopted by the Water Resources Commission in November 2018 (OAR Chapter 690, Division 86). It describes water management, water conservation, and curtailment programs to guide the wise use and stewardship of the City's and District's water supply.

The Plan also fulfills the requirements of OAR 690-315-0090(3), which applies because access to additional water under extended Permit G-16917 is requested.

The WMCP is organized into the following sections, each addressing specific sections of OAR Chapter 690, Division 86. Section 2 is a self-evaluation of the District's and the City's water supplies, water use, water rights, and water systems. The information developed for Section 2 is the foundation for the sections that follow. The later sections use this information to evaluate the water conservation and water supply planning efforts of the providers, including how projected demands will be met solely with groundwater beginning in 2026 through 2042.

Section	Requirement
Section 1 – Municipal Water Supplier Plan Elements	OAR 690-086-0125
Section 2 – Water Supplier Description	OAR 690-086-0140
Section 3 – Water Conservation	OAR 690-086-0150
Section 4 – Curtailment Plan	OAR 690-086-0160
Section 5 – Water Supply	OAR 690-086-0170

1.4 Affected Local Governments

OAR 690-086-0125(5)

The following governmental agencies may be affected by this WMCP:

- City of Fairview
- City of Portland
- Metro
- City of Wood Village
- City of Troutdale
- Multnomah County

Thirty days before submitting this WMCP to OWRD, the District and City made the draft WMCP available for review by each affected local government listed above along with a request for comments relating to consistency with the local government's comprehensive land use plan. Appendix A contains the letters requesting comment and comments received. The District and City also provided a courtesy copy of the WMCP to Interlachen and Lusted Water Districts, and the Regional Water Providers Consortium (RWPC).

1.5 Plan Update Schedule

OAR 690-086-0125(6)

The District and City anticipate submitting an update of this Plan within 10 years of OWRD's final order approving the Plan. As required by OAR Chapter 690, Division 86, a progress report will be submitted within 5 years of the final order.

1.6 Time Extension

OAR 690-086-0125(7)

The District and City are not requesting an extension of time to implement metering, or a benchmark established in a previously approved plan.

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2. Water Supplier Description

This section satisfies the requirements of OAR 690-086-0140.

This rule requires descriptions of the District and City water sources, water delivery area and population, water rights, and adequacy and reliability of the existing water supply. The rule also requires descriptions of the District and City customers and their water use, the water system, interconnections with other water suppliers, and quantification of water loss.

2.1 Rockwood Water People's Utility District

2.1.1 Water Sources

OAR 690-086-0140(1)

The District obtains its base water supply directly from the PWB's Bull Run conduits through wholesale master metered connections. During a high turbidity event or emergency at Bull Run or during periods of high demand, the District can receive groundwater from PWB's Columbia South Shore well field that is backed through PWB's Powell Butte Reservoir south of the District. All of the District's water demands beyond the 6.94 million gallons per day (mgd) PWB base flow are supplied from the District's and City's Cascade groundwater system. The Cascade groundwater system currently consists of the District's Cascade Wells 3, 4, and 5. These sources are described in more detail later in this section under System Description.

2.1.2 Intergovernmental Agreements

OAR 690-086-0140(1)

1. Regional Water Sales Agreement with the Portland Water Bureau

The District has an intergovernmental agreement (IGA) with PWB for the purchase of water. The agreement specifies a guaranteed purchase quantity of 6.94 mgd. The District may purchase water over and above the guaranteed purchase quantity, but may result in increased wholesale water costs and penalties if it exceeds the District's projected peaking factors. The agreement expires in 2026. The District has informed PWB that it will not renew the contract and will instead rely on water produced from the Cascade groundwater system. The District is evaluating options for emergency supplies that may result in an IGA with PWB to provide access to available water if the Cascade groundwater system is not capable of meeting demands during emergency events.

2. Cascade Groundwater System Intergovernmental Agreements

As previously described, the District obtains its base water supply from the PWB's Bull Run supply conduits as wholesale customers of PWB. To reduce wholesale water costs and provide a redundant water supply, the District began developing the Cascade groundwater system. The City wished to participate in development of this system, and, in response, the District and City

developed three primary IGAs outlining development of the system and ownership, management, and operations responsibilities.

Under the District's IGA (Contract No. 1827) and Amendment 1 with the City, the District granted the City use of up to 18 mgd from the Cascade groundwater system under Permit G-16917 and Certificate 83629. The IGA is perpetual and only terminates upon written consent by both parties. A joint operations agreement (Contract No. 5794, superseding Contract No. 2046) accompanied Contract No. 1827 and defines the operational responsibilities and infrastructure ownership of the Cascade groundwater system. The latest IGA between the District and City, Contract No. 310774, confirms coordination between these providers regarding the implementation of the 2020 Groundwater Development Master Plan in areas of development, construction, connection, and operation of joint groundwater supply infrastructure.[1]

2.1.3 Interconnections with Other Systems

OAR 690-086-0140(7)

The District has seven interties for water from PWB's Bull Run source. In addition to these supply connections, the District also maintains emergency water system interties with the Cities of Fairview, Wood Village, and Gresham and with PWB as summarized in Exhibit 2-1. (Other interties exist or will exist between Gresham and Rockwood that are part of the Cascade groundwater system.) Interconnections with bi-directional capabilities allow either water supplier to receive or provide water.

[1] Murraysmith. September 2020. *Rockwood Water People's Utility District & City of Gresham Groundwater Development Master Plan*.

Exhibit 2-1. Rockwood Water People's Utility District Emergency Interties

Location	Connection with:	Supply Direction
NE 223rd Avenue & NE Glisan Street	Gresham, Wood Village, & Fairview	to Rockwood
SE 182nd Avenue south of SE Haig Drive	Gresham	to Rockwood
SE Burnside Street & SE 202nd Avenue	Gresham	to Rockwood
NE Division Street & NE Cleveland (235th) Ave.	Gresham	to Rockwood
SE 223rd Avenue & SE Ash Street	Gresham	Bi-directional
SE 223rd Avenue & SE Stark Street	Gresham	Bi-directional
SE 238th Avenue & SE Stark Street	Gresham	Bi-directional
NW Burnside Road & NW Shattuck Way	Gresham	Bi-directional
SE 226th Avenue & SE Morrison Court	Gresham	Bi-directional
NE 185th Drive & NE Sandy Boulevard	Gresham	To Gresham
NW Fariss Road & NW Burnside Road	Gresham	(1)
SE 135th Avenue & SE Stark Street	PWB	(1)
SE 132nd Avenue & SE Stark Street	PWB	(1)
SE 148th Avenue & SE Lincoln Street	PWB	Bi-directional
132nd block of East Burnside St (N & S)	PWB	Bi-directional
SE 135th Avenue	PWB	Uni-directional
NE 148th Avenue & Broadway	PWB	Bi-directional

(1) Supply direction to be determined.

2.1.4 Service Area Description and Population

OAR 690-086-0140(2)

1. Service Area

The District's service area is located within the Cities of Portland, Gresham, and Fairview. The District is generally bounded by Interstate 84 to the north, the Cities of Fairview and Wood Village to the east, SE Haig Drive and an elementary school just south of NW 1st Street to the south, and SE 135th Avenue to the west. The District's service area is adjacent to several other water providers' service areas, including PWB, the City of Gresham, and the City of Fairview. The District's service area boundary is expected to remain constant in the future. New customers and increased future water demands are expected primarily as a result of expanded industrial and commercial development, as well as development to maximum density of currently vacant and underdeveloped land within the existing service area. Exhibit 2-2 provides a schematic of the District's water service area.

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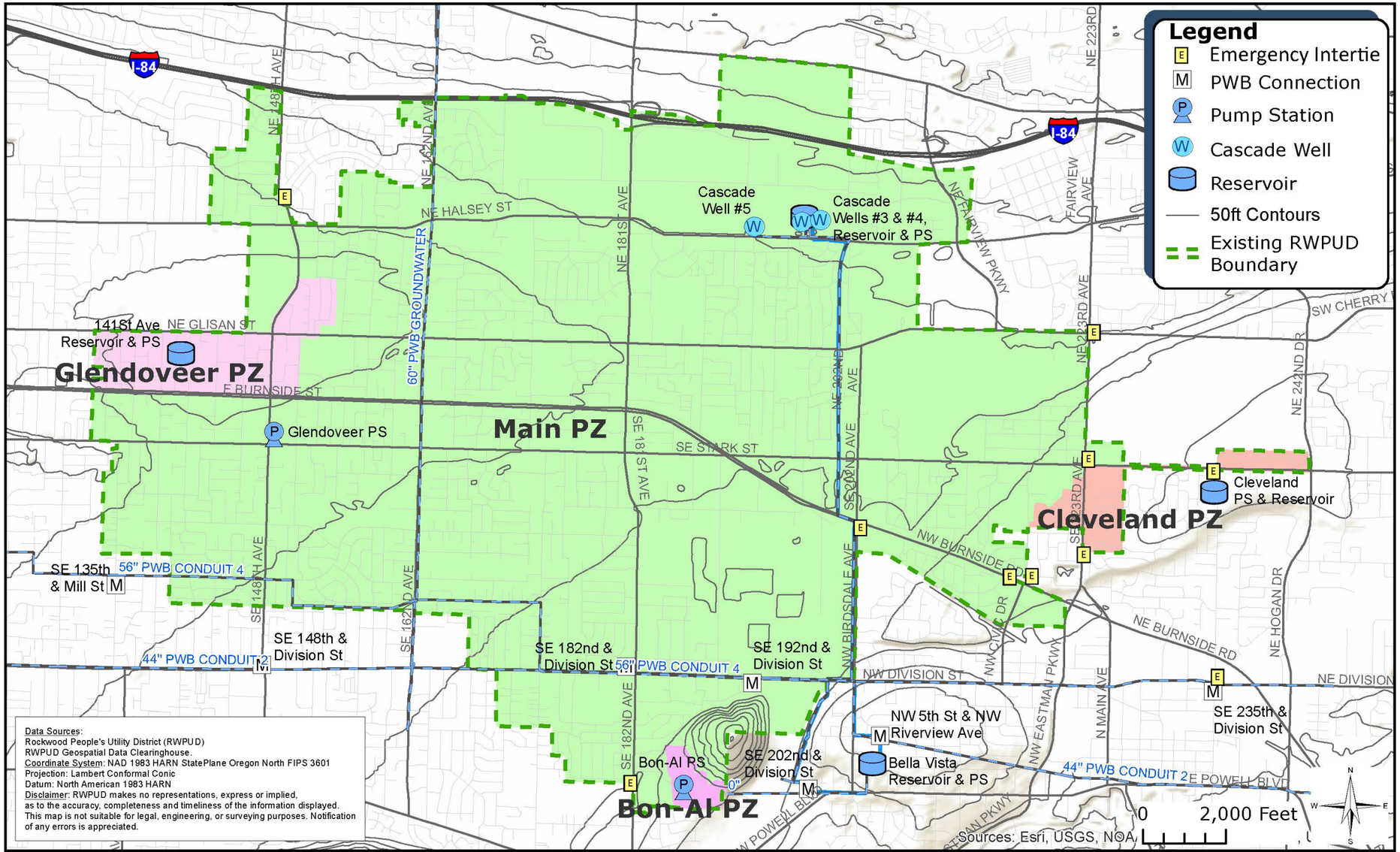
Exhibit 2-2. Rockwood Water People's Utility District Schematic



Date: December 3, 2022

consor

EXHIBIT 2-2
Rockwood Water District Water System schematic
2022 Water Management and Conservation Plan

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2. Existing Population

The District's service area population was estimated to be 66,397 in 2021. The source of this estimate was a 2022 population study developed for members of the RWPC by the Portland State University's Population Research Center.[2]

2.1.5 Definitions

Generally, demand and consumption in municipal systems are expressed in units of mgd. They may also be expressed in cfs or gallons per minute (gpm). One mgd is equivalent to 1.55 cfs or 694 gpm. For annual or monthly values, a quantity of water is typically reported in million gallons (MG).

The following terms are used to describe specific values of system demands:

Demand or *system demand* refers to the combined quantity of water produced by the Cascade groundwater system to meet demand and any additional quantities obtained from outside sources, such as PWB.

Average day demand (ADD) equals the total annual system input (demand) divided by 365 days.

Maximum day demand (MDD) equals the highest system demand that occurs on any single day during a consecutive twelve-month period (fiscal or calendar year). MDD is an important value for water system planning. The supply facilities (treatment plants, pipelines, reservoirs) and water rights must be capable of meeting the MDD. If the MDD exceeds the combined supply capacity on any given day, finished water storage levels will be reduced and consecutive days at or near the MDD could result in a water shortage.

Maximum monthly demand (MMD) is measured in MG and equals the highest total monthly demand during a consecutive 12-month period (fiscal or calendar year). MMD in mgd equals the ADD of the one month with the highest total demand of the 12 months period.

Peaking factors are the ratios of one demand value to another. The most common and important peaking factor is the ratio of the MDD to the ADD and is the factor used herein.

[2] Portland State University, Population Research Center. June 2022. *Regional Water Providers Consortium: Population, Housing Unit, and Household Estimates 2020 and 2021*.

2.1.6 Historical Water Demands

OAR 690-086-0140(4)

1. Annual Demands

Exhibit 2-3 summarizes water demands for the overall system. From 2012 through 2021, the District's annual demand averaged 2,374.6 MG with the highest volume of 2,611.2 MG in 2021. During the same period, the District's ADD ranged from 6.19 mgd to 7.15 mgd, and the average ADD was 6.51 mgd. MDD ranged from 8.59 mgd to 10.93 mgd and averaged 9.65 mgd from 2017 to 2021.

Exhibit 2-3. Rockwood Water People's Utility District's Demand, 2012–2021

Year	Groundwater Demand (MG)	Wholesale Water Purchased (MG)	Total Demand (MG)	ADD (mgd)	MDD[1] (mgd)	MMD (mgd)	MMD (MG)	Peaking Factor (MDD: ADD)
2012	139.8	2,254.7	2,394.5	6.56	—	8.45	261.9	—
2013	87.2	2,249.7	2,336.9	6.40	—	8.64	267.8	—
2014	80.3	2,324.0	2,404.4	6.59	—	8.24	255.5	—
2015	112.8	2,241.7	2,354.5	6.45	—	8.93	276.7	—
2016	39.9	2,231.8	2,271.8	6.22	—	7.97	247.1	—
2017	126.2	2,234.0	2,360.2	6.47	9.66	8.84	274.2	1.5
2018	136.3	2,237.0	2,373.3	6.50	9.84	8.93	276.9	1.5
2019	81.9	2,178.0	2,259.9	6.19	8.59	7.43	230.2	1.4
2020	118.9	2,259.9	2,378.8	6.52	9.22	8.19	253.8	1.4
2021	233.1	2,378.0	2,611.2	7.15	10.93	9.06	280.9	1.5
Average	**115.7**	**2,258.9**	**2,374.6**	**6.51**	**9.65**	**8.47**	**262.5**	**1.5**
Max	**233.1**	**2,378.0**	**2,611.2**	**7.15**	**10.93**	**9.06**	**280.9**	**1.5**

[1]Historical MDD data was only available for 2017 through 2021.

MDD is strongly influenced by weather patterns, conservation programs, and the economy. Weather patterns often cause fluctuations in MDD from year to year. Weather patterns that influence MDD include maximum temperatures, the number of consecutive days with high temperatures, when high temperatures occur in the summer, overall rainfall levels during the summer, humidity, wind conditions, and consecutive days without rainfall. Unusually hot or dry weather results in more outdoor irrigation, which increases the MDD. Conservation programs can reduce customer demands for water during high demand periods of the day and year. The economy can affect MDD, as well. Customers may choose to irrigate less to save money in an economic downturn. The economy also influences the number of new homes with landscapes

needing intense irrigation for plant establishment and the opening or closing of facilities that use water in their operations.

Exhibit 2-4 shows the District's annual demand from 2012 to 2021. The District's previous WMCP showed a decreasing trend in demand, showing annual volumes above 2,500 MG from 2006 to 2009 and below 2,500 MG in 2010 and 2011. Demand from 2012 through 2020 continued to remain below 2,500 MG with the exception of demand in 2021.

Exhibit 2-4. Rockwood Water People's Utility District's Annual Demand, 2012–2021

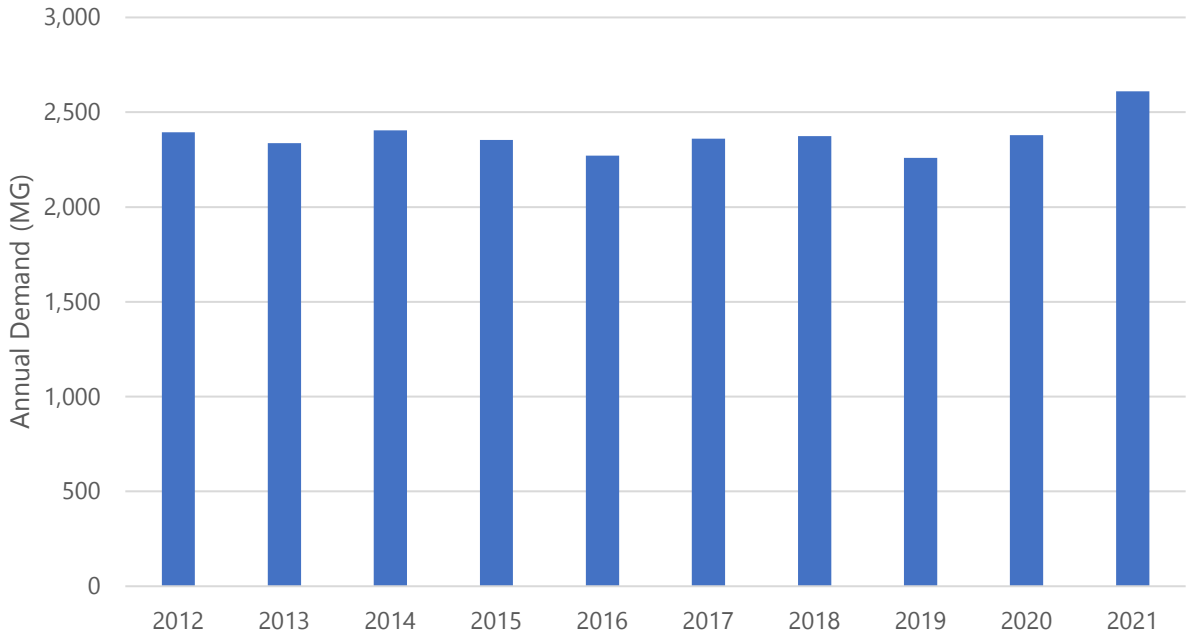
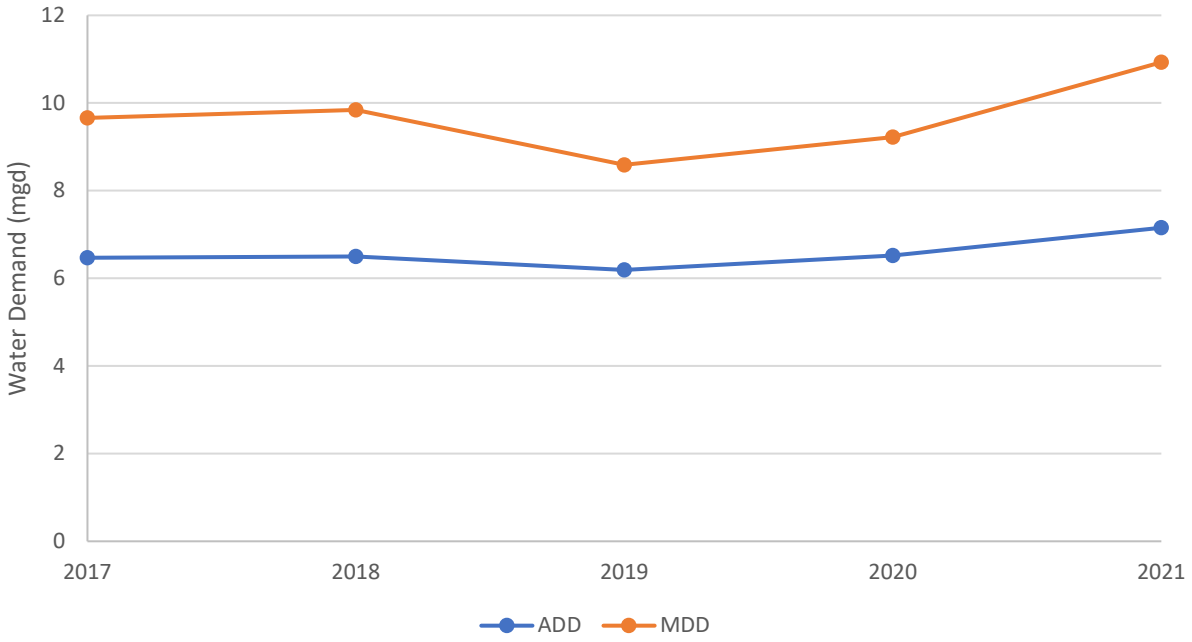


Exhibit 2-5 shows the District's ADD and MDD for 2017 through 2021. During this period, ADD remained fairly flat with a slight increase at the end of the period and MDD showed a dip in 2018 and 2019, though ended the period at a rate higher than the previous 4 years. While ADD for this period remained similar to the ADD values presented in the previous WMCP, annual MDD values are generally higher for 2006 to 2011, averaging 11.4 mgd compared to the more recent average of 9.65 mgd. The general trend of decreasing MDD may be due to the positive impact of the District's conservation programs.

Exhibit 2-5. Rockwood Water People's Utility District's Average Day Demand and Maximum Day Demand, 2017–2021



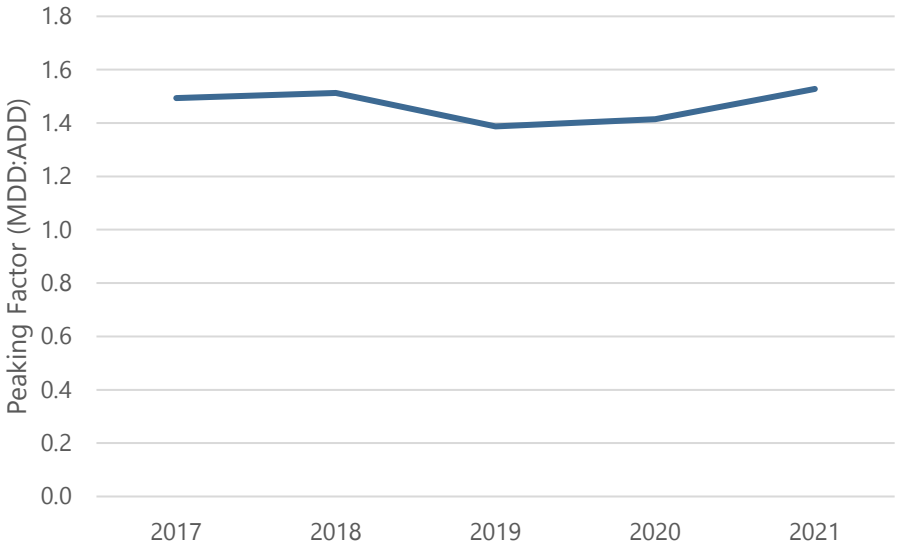
2. Peaking Factors

Consistent with the data presented in Exhibit 2-3 in tabular form, Exhibit 2-6 illustrates that the peaking factors from 2017 through 2021 remained relatively stable at 1.4 to 1.5. This value is equivalent to the City's average peaking factor based on data from 2012 through 2021 and slightly lower than the average peaking factor of other Portland Metro area water utilities, such as Hillsboro (1.8), Beaverton (1.9), and Forest Grove (1.8) based on data from 2008–2019[3] and Lake Oswego (2.5) and Tigard (2.0) based on data from 2003–2017[4].

[3] GSI Water Solutions, Inc. February 2021. *Joint Water Commission Water Management and Conservation Plan*. https://jwcwater.org/wp-content/uploads/2021/10/JWC-WMCP_Final_02-01-2021.pdf.

[4] GSI Water Solutions, Inc. July 2019. *City of Lake Oswego and City of Tigard Water Management and Conservation Plan*. https://www.ci.oswego.or.us/sites/default/files/fileattachments/LOT%20Final%20Draft%20WMCP%20for%20OWRD.pdf.

Exhibit 2-6. Rockwood Water People's Utility District's Peaking Factors, 2017–2021



2.1.7 Monthly and Seasonal Demand

As can be expected, the District's MMD occurred during the summer months when outdoor water use is highest. The MMD occurred in July 2013, 2014, 2015, 2018, and 2021, and in August in 2012, 2016, 2017, 2019, and 2020. The record-breaking high temperatures during the "heat dome" in late June and early July 2021 correspond with the unusually high MDD of 10.93 mgd on June 28 and the MMD in July of that year being the highest of all the years for which data is presented here. The MMD average volume from 2012 to 2021 was 262.5 MG and highest volume was 280.9 MG in 2021.

Exhibit 2-7 shows monthly demand data from 2012 to 2021 expressed as an average daily demand for the month, with the highest water use months of June through September in red. Exhibit 2-7 highlights the seasonal changes in demand that the District experiences and that the months of July and August typically have the highest demand. Consequently, these months would likely yield the most benefit from the District's water conservation efforts.

Exhibit 2-7. Rockwood Water People's Utility District's Monthly Average Day Demand, 2012–2021

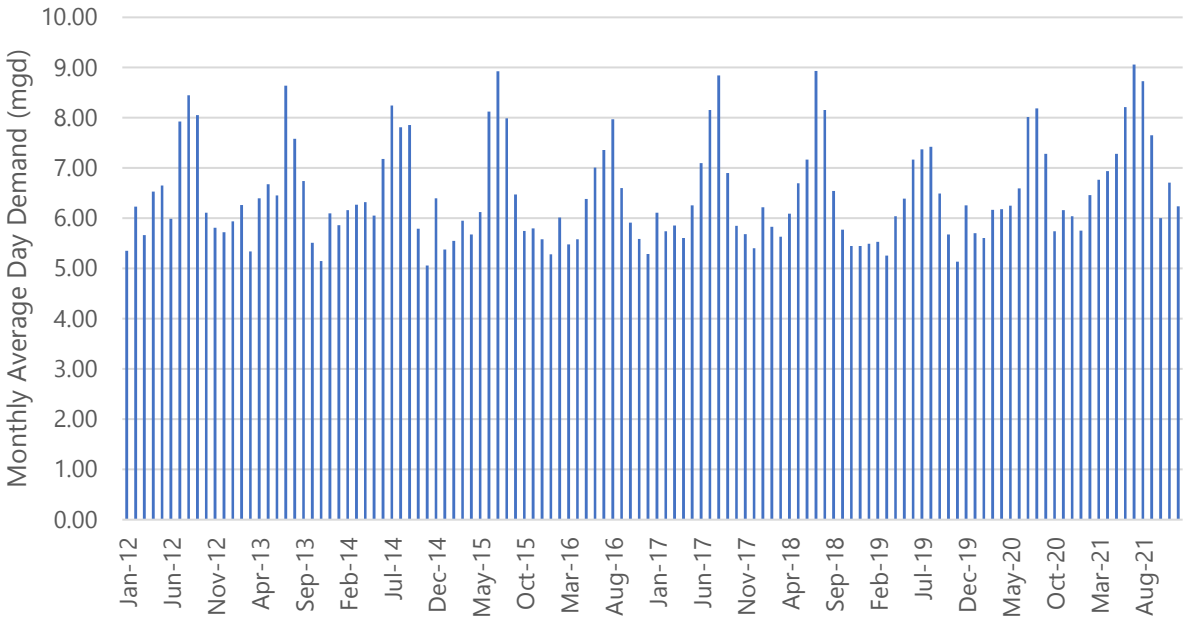
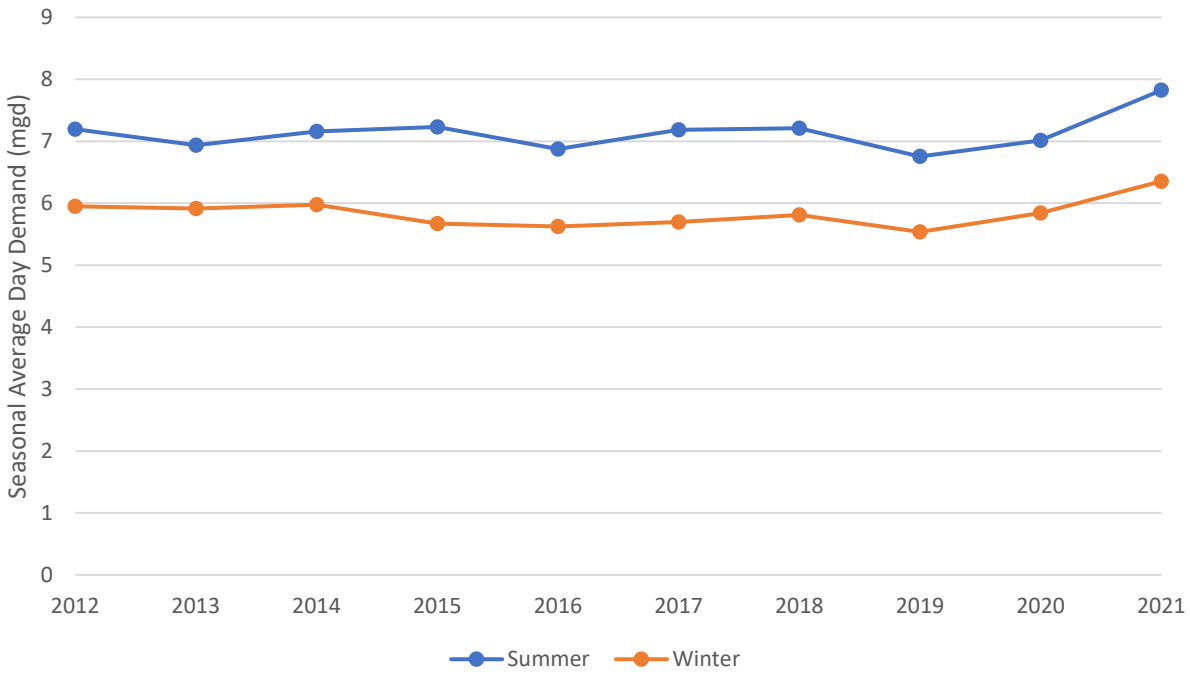


Exhibit 2-8 illustrates the summer period (defined as May through October) and winter period (November through April) ADDs for 2012 through 2021. As shown, the District's ADD is greater during the summer months, primarily because of outdoor irrigation. From 2012 through 2021, summer ADD ranged from 6.75 mgd to 7.82 mgd and winter ADD ranged from 5.54 mgd to 6.35 mgd.

Exhibit 2-8. Rockwood Water People's Utility District's Historical Seasonal Average Day Demand (mgd), 2012–2021



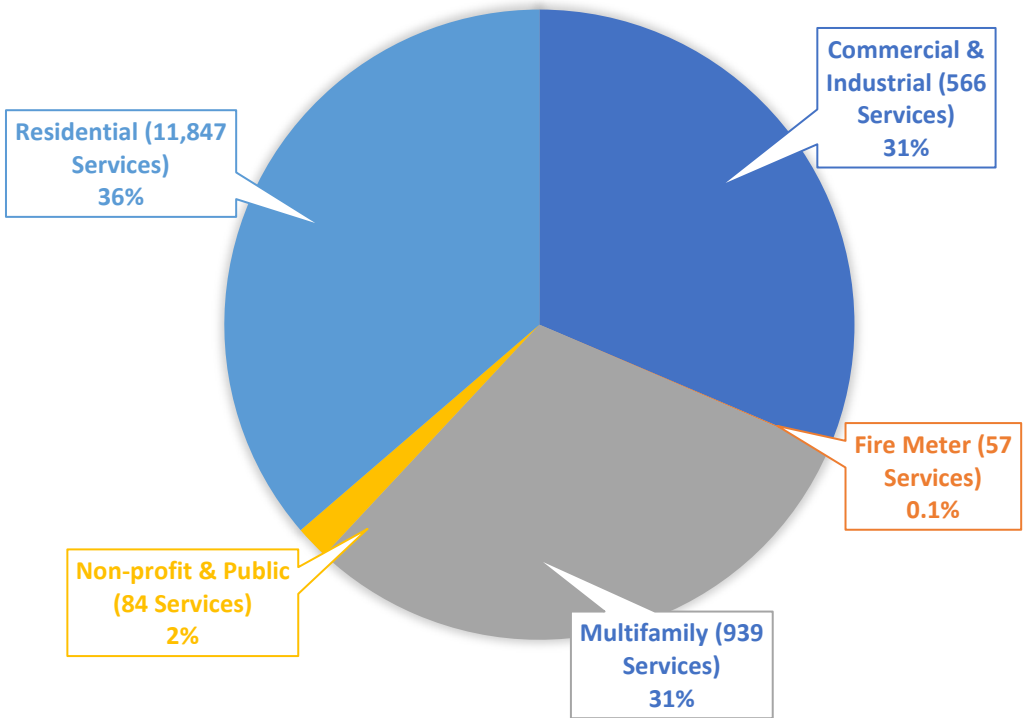
2.1.8 Customer Characteristics and Use Patterns

OAR 690-086-0140(6)

The District maintains historical water consumption records based on bi-monthly customer billing data. The District tracks water consumption for five customer categories through the water billing system: residential, multifamily, commercial, and industrial, non-profit, and public, and fire meter.

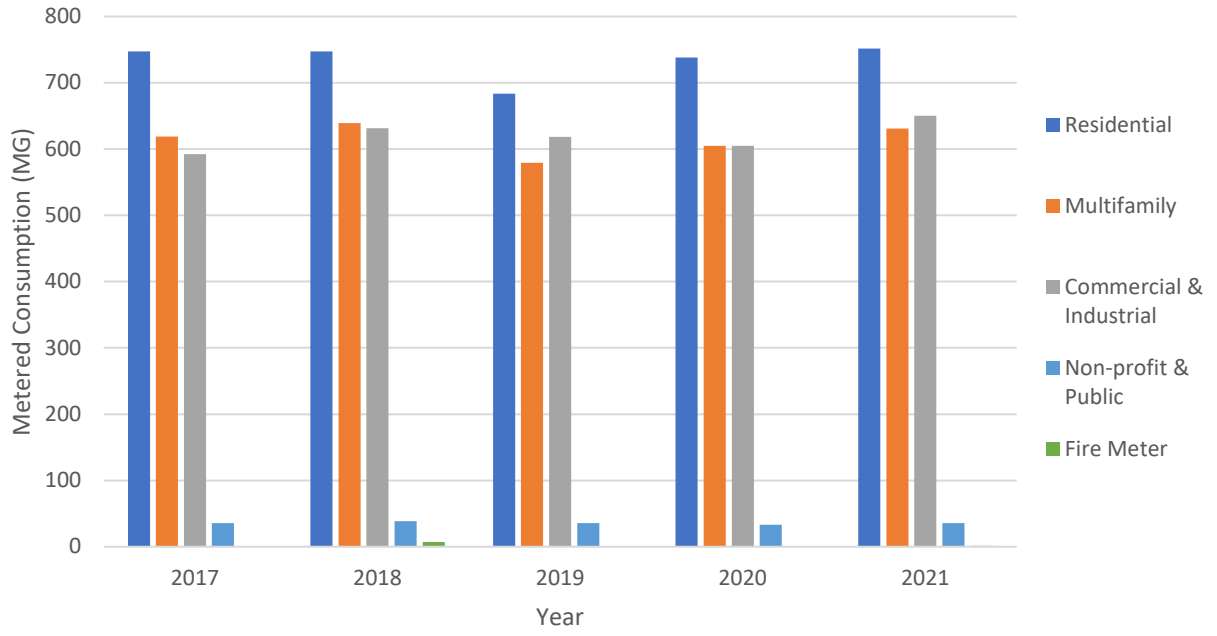
Exhibit 2-9 shows the number of District customer accounts by customer category and percent annual water use for 2021. Residential accounts include single family dwellings that are individually metered, townhomes, and duplexes. Fire meter accounts include sprinkler systems and private fire hydrants. Multifamily accounts include apartment complexes and mobile home parks. The customer categories with the highest water use were residential (36 percent), multifamily (31 percent), and commercial and industrial (31 percent), which indicates that water conservation opportunities should target all three customer categories.

Exhibit 2-9. Rockwood Water People's Utility District's Number of Accounts and Percent Annual Water Use by Customer Category, 2021



The annual metered consumption by customer category for 2017 through 2021 is shown in Exhibit 2-10. Residential and multifamily use dipped in 2019 and then began increasing again in 2020. Residential use ranged from 683.8 MG to 751.6 MG, and multifamily use ranged from 579.2 MG to 639.1 MG. Overall, annual residential and multifamily water use volumes for 2017 through 2021 declined from the period reported in the previous WMCP but were slightly higher than the water use described in the District's WMCP progress report. The previous WMCP showed a declining trend in commercial and industrial water use through 2011, which began to reverse around 2015, as shown in the WMCP progress report. Commercial and industrial water use increased from 2017 to 2021 with a low of 592.2 MG in 2017 and a high of 650.0 MG in 2021. From 2017 to 2021, non-profit and public water use remained relatively stable, between 33.2 MG and 38.6 MG annually. These annual volumes show a slight reduction compared to the previous WMCP and progress report. Fire meters continue to represent a minimal use, with an average of 2.1 MG annually between 2017 and 2021.

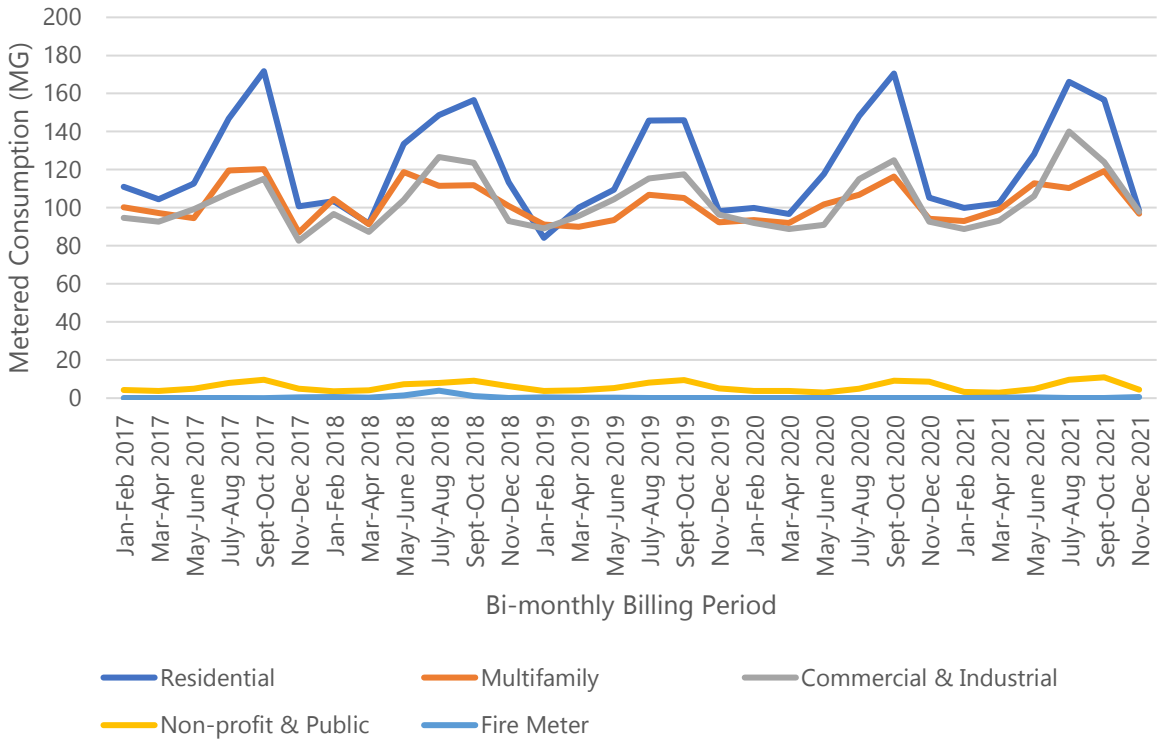
Exhibit 2-10. Rockwood Water People's Utility District's Annual Metered Consumption by Customer Category, 2017–2021



1. Bi-monthly Water Use

Exhibit 2-11 shows the bi-monthly consumption by customer category for the years 2017 through 2021. Consumption increases in the summer months on an annual basis, which can likely be attributed to outdoor water use, and irrigation in particular. The highest bi-monthly consumption was 171.7 MG in September through October 2017 for residential water users and 120.3 MG in September through October 2017 for multifamily residential water users. Both of these consumption volumes represent a decrease in maximum bi-monthly water use for residential and multifamily customers compared to the volumes reported in the previous WMCP.

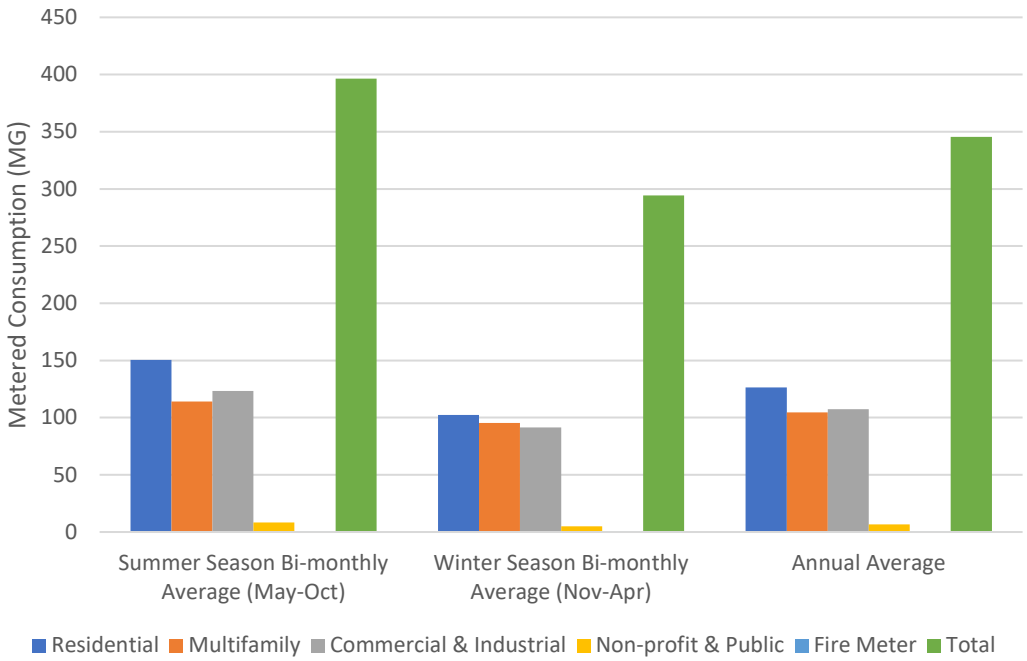
Exhibit 2-11. Rockwood Water People's Utility District's Bi-Monthly Metered Consumption by Customer Category, 2017–2021



2. Seasonal Water Use

Exhibit 2-12 shows the District's average bi-monthly consumption by season and customer category for 2021. For the purposes of this WMCP, the summer months are defined as May through October and the winter months are defined as November through April, which are groupings influenced by the bi-monthly billing schedule. Non-profit and public use had the greatest summer season to winter season ratio (1.72) likely due to irrigation at City parks and other public locations with irrigation systems. Fire meter has the second greatest ratio (1.68)—possibly as a result of the use of hydrants by contractors during the height of the building season in the summer—followed by the residential (1.47), and commercial and industrial (1.35) use categories. The residential and commercial and industrial customer categories use significantly more water annually compared to non-profit and public or fire meters, so water conservation strategies targeting these categories are likely to be more effective at producing water savings. Given that residential water users comprise the largest water consumption category overall, targeting summer water use by residential customers may yield the greatest opportunity for water savings.

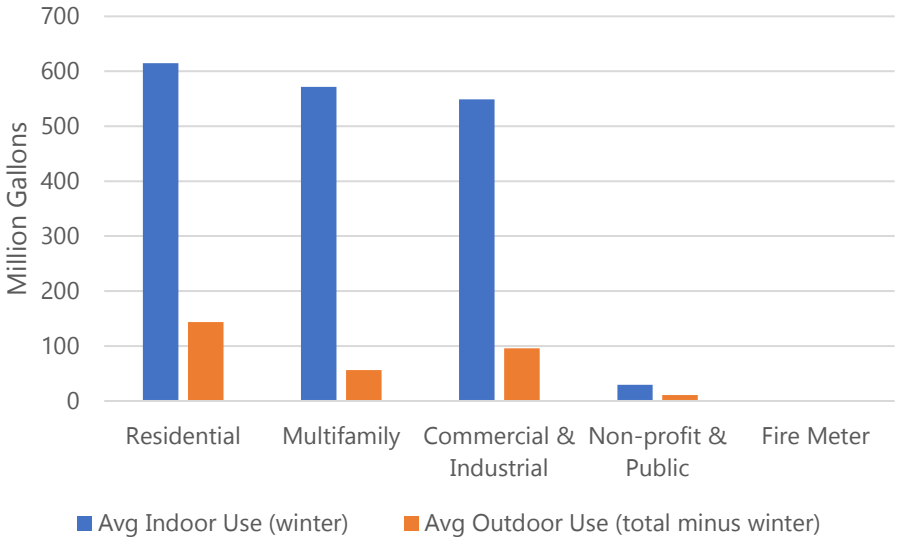
Exhibit 2-12. Rockwood Water People's Utility District's Seasonal Water Consumption by Customer Category, 2021



3. Indoor and Outdoor Water Use

Estimates of indoor and outdoor water use by customers may provide information that helps the District target its water conservation efforts. The winter season bi-monthly average volumes for each customer category were 102.5 MG for residential, 95.3 MG for multifamily, 91.5 MG for commercial and industrial, 4.9 MG for non-profit and public, and 0.1 MG for Fire meter. These volumes were multiplied by six (for the six bi-monthly periods) to estimate the average annual indoor use by these customer categories in 2021. Subtracting the estimated average annual indoor use per customer category from the total annual use of each category yielded the estimated outdoor water use of each customer category, as shown in Exhibit 2-13. (Fire meter volumes were too small to capture in the exhibit.)

Exhibit 2-13. Rockwood Water People's Utility District's Indoor and Outdoor Water Use



Based on these estimates, indoor water use by the entire District in 2021 represented approximately 85.2 percent of total water use and outdoor water use represented approximately 14.8 percent of total water use annually. Residential outdoor water use represented approximately 18.9 percent of total residential water use. Outdoor water use represented approximately 9.0 percent of total multifamily water use, approximately 14.8 percent of total commercial and industrial water use, and approximately 26.4 percent of total non-profit and public outdoor water use. Outdoor water use percentages reported here are higher across all customer categories compared to the previous WMCP. This may be attributed partially to the success of the District's water conservation programs targeting indoor use, and partially to climatic conditions in the years for which data is presented. According to the City of Portland HYDRA Rainfall Network, average rainfall in the Portland area during water year 2011 (October 2010 through September 2011) was 53.76 inches, while the average rainfall during water year 2021 (October 2020 through September 2021) was only 36.70 inches.[5] In addition, record-breaking high temperatures occurred in the area during the "heat dome" in late June 2021.

4. Largest Water Users

Exhibit 2-14 lists the District's top 10 water consumers in 2021. These customers were responsible for use of 491.4 MG during 2021, which was 23.7 percent of the total annual use.

[5] City of Portland. November 2022. City of Portland HYDRA Rainfall Network, https://or.water.usgs.gov/non-usgs/bes/, Last Modified November 7, 2022.

Exhibit 2-14. Rockwood Water People's Utility District's Top 10 Water Consumers, 2021

Customer Type	Annual Volume Used (MG)	Percent of Annual Volume (%)
Commercial/Industrial	379.7	18.3
Commercial/Industrial	24.3	1.2
Commercial/Industrial	14.1	0.7
Multi-Family	12.7	0.6
Multi-Family	11.4	0.6
Multi-Family	10.8	0.5
Multi-Family	10.5	0.5
Commercial/Industrial	10.3	0.5
Commercial/Industrial	8.8	0.4
Multi-Family	8.7	0.4
Total	**491.4**	**23.7**

5. Historical Comparison of Consumption

The District compared consumption data presented in the 2013 Rockwood and Gresham WMCP and the 2018 progress report to the account and consumption data presented above to highlight similarities and differences observed over time. Since 2011, the annual consumption of each of the District's three largest classes—the residential, commercial/industrial, and multifamily classes—has made up about one third of total annual consumption. This near constant ratio held over time and is explained by an increase in the count of residential and multifamily accounts from 2011 to 2021 resulting from ongoing population growth within the District's service area coupled with an economic rebound experienced by the District's commercial/industrial customers starting in the early 2010s following the Great Recession (2007 to 2009).

The trajectory of consumption for the multifamily and commercial/industrial classes trended down from 2006 through the mid-2010s, then increased to reach the previous volumes observed during the mid- to late-2000s. While the consumption of the residential class also followed this trend, residential consumption did not reach the same highs by the early 2020s that were observed in the mid-2000s.

Other characteristics of consumption described above for the years 2017 to 2021 generally were similar to those observed from 2006 to 2011, such as consistent observation of seasonal increases to metered consumption for nearly all classes during the summer months. In addition, the seasonal ratios (summer:winter) for the three major classes in 2021 were similar to those observed in 2011.

2.1.9 Water Losses

OAR 690-086-0140(9)

For the District, water loss is calculated as the difference between the amount of water demand (groundwater plus PWB wholesale supply) minus authorized consumption. Authorized consumption is the sum of the amount of water measured through meters to customers, other metered authorized uses (wheeled water; water usage from hydrants and at construction sites; system flushing; and similar operations and maintenance), and unmetered authorized uses (fire flow tests; and firefighting and training). Water loss includes apparent losses (i.e., unauthorized consumption, meter inaccuracies, and data handling errors) and real losses (e.g., system leakage). System leakage, as the name implies, is water loss from deteriorating or compromised pipes, pipe joints, service connections, and valves, among other sources. The District is not aware of any unauthorized consumption.

Exhibit 2-15 lists the District's annual total demand and total consumption and shows the water loss quantities and percentages for the years 2017 through 2021. During this period, water losses ranged from 12.4 percent (2019) to 18.9 percent (2021), averaging 14.5 percent.

Exhibit 2-15. Rockwood Water People's Utility District's Historical Water Loss, 2017–2021

Year	Annual Production (MG)	Total Metered Consumption (MG)	Authorized, Unbilled Consumption (MG)	Water Loss (MG)	Water Loss (%)
2017	2,360.2	2,000.1	28.3	331.8	14.1
2018	2,373.3	2,037.2	34.2	301.9	12.7
2019	2,259.9	1,932.8	45.8	281.3	12.4
2020	2,378.8	2,000.3	33.7	344.8	14.5
2021	2,611.2	2,087.7	29.0	494.5	18.9
Average	**2,396.7**	**2,011.6**	**34.2**	**350.9**	**14.5**

2.1.10 Water Rights

OAR 690-086-0140(5)

The District holds two groundwater rights and one surface water permit application. Exhibit 2-16 provides detailed information about the District's municipal water rights that supply potable water through its publicly owned municipal distribution system.

The District's most senior water right is Certificate 83629, which authorizes the use of up to 10 cfs (6.46 mgd) from two wells that develop the Sand and Gravel Aquifer (SGA) of the Willamette Basin. The maximum authorized rate is limited to up to 5.34 cfs from Cascade Well 3 and 8.97 cfs from Cascade Well 4. Certificate 83629 authorizes the use of water for municipal purposes and has a priority date of January 9, 1976.

The District also holds municipal water use Permit G-16917 (previously Permit G-8719), which authorizes the use of up to 53.5 cfs of groundwater from nine wells that also develop the SGA of the Willamette Basin. The priority date of this water right is December 21, 1977. The District applied for an extension of time in 1997 and updated its extension application in 2003. On April 10, 2012, following negotiations over a protest related to proposed conditions of the extension, OWRD issued a final order extending the development deadline for Permit G-8719 to October 1, 2047. The final order limited use of water under the "extended permit" to 4.42 cfs pending approval of a WMCP authorizing access to more water under the permit. The District assigned a 10 mgd portion of the permit to the City in May 2012. On July 10, 2012, OWRD approved Permit Amendment T-10554, which changed the location of the six authorized points of appropriation, including a small adjustment to the location of Cascade Well 3, and added three additional points of appropriation. Following approval of Permit Amendment T-10554, Permit G-16917 was issued, superseding Permit G-8719. The District and City submitted a joint WMCP in April 2013 that included a request for access to 33.5 cfs under the permit, and OWRD's August 2013 final order approving the WMCP granted access to the additional water as requested. A second permit amendment application (T-13274) was submitted in October 2019 and was updated in September 2021. This permit amendment, which is still pending at OWRD and has not been

approved, requests to add three additional authorized points of appropriation to the permit (Cascade 7, Cascade 9, and Well 10) and to change the authorized location of Well 4 .

Finally, the District filed permit Application S-72354 for the use of surface water on April 27, 1992. Application S-72354 requests the use of up to 77.0 cfs from the Columbia River for municipal use. On August 30, 1996, OWRD issued a final order approving the application. Although the application is listed here, OWRD has not issued a permit for this application, and it is uncertain if a permit will ever be issued. For a permit to be issued, the District would be required to provide OWRD with additional information, including demonstration of access to the point of diversion and land use forms associated with diverting, conveying, and using water in areas outside of the City of Fairview. If a permit is issued to the District, it would be limited to a 10-year period, although it could potentially be renewed for additional 10-year periods.

Exhibit 2-16. Rockwood Water People's Utility District Water Rights for Potable Municipal Water Use

Source	Priority Date	Application	Permit	Permit Amendment	Certificate	Type of Beneficial Use	Authorized Rate	Authorized Volume	Maximum Rate of Withdrawal to Date		2021 Average Combined (District and City) Withdrawal(1)	Five-Year (2017–2021) Average Combined (District and City) Withdrawal (1)	Authorized Date for Completion	Comments
									Instantaneous	Annual (1)	Day/Month	Day/Month		
Groundwater; Cascade Well 3 and Cascade Well 4	1/9/1976	G-7217	G-6639	N/A	83629	Municipal	10 cfs: up to 5.34 cfs from Cascade 3 and 8.97 cfs from Cascade 4	N/A	10.0 cfs	666.6 MG	4.3 mgd/128.8 MG	3.2 mgd/95.6 MG	N/A	Rockwood Water People's Utility District's Water Right
Groundwater; Well 1 (Cascade Well 5), Well 2, Well 3 (Cascade Well 6), Well 4, Well 5, Well 6 (Cascade Well 3), Well 7, Well 8 (Cascade Well 8), Cascade Well 4	12/21/1977	G-8585	~~G-8719~~ G-16917	~~T-10554~~ T-13274 (pending)	N/A	Municipal	53.50 cfs (from up to 9 wells, including Cascade 3, 4, and 5)	N/A	11.8 cfs (2)				10/1/2047	Rockwood Water People's Utility District and City of Gresham's shared water right. The City holds a 10 mgd portion of this permit. Following approval of Permit Amendment T-10554, OWRD issued superseding Permit G-16917. Pending permit amendment T-13274 would add three wells and change the location of Well 4.
Columbia River	4/27/1992	S-72354	N/A	N/A	N/A	Quasi-Municipal	77.00 cfs	N/A	0	N/A	0 mgd/0 MG	0	N/A	Rockwood Water People's Utility District's Water Right Application. OWRD issued a final order for Application S-72354 but has not issued a permit. If issued, a resulting permit would expire after 10 years, but could potentially be renewed.

Notes

(1) Based on the combined volumes of water produced at Cascade Wells 3, 4, and 5.
(2) Based on the maximum pumping capacity of Cascade Well 5 of 7.6 mgd (11.8 cfs).

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1. Aquatic Resource Concerns

The District only holds water rights authorizing the use of groundwater. The District's groundwater supply is not appropriated from an area designated as a critical groundwater area or a groundwater limited area.

As described above, OWRD has not issued a permit for Application S-72354, and it is uncertain if a permit will ever be issued for this application. For this reason, this plan does not include an identification of the streamflow-dependent species in the Columbia River.

2.1.11 Evaluation of Water Rights/Supply

OAR 690-086-0140(3)

As described above, the District obtains its base water supply from PWB. Although the PWB's Bull Run water supply is generally reliable, it is unfiltered and, accordingly, occasionally experiences high-turbidity events. Further, the PWB water supply could be affected in the event of a wildfire or earthquake in the Bull Run watershed.

The District holds two rights, which authorize use of groundwater at a total combined rate of up to 63.5 cfs. The current combined capacity of the Cascade groundwater wells that includes Wells 3 through 5 is approximately 27.2 cfs (17.6 mgd). As a result, the District's current use of groundwater is limited by the capacity of its existing wells.

The District holds one groundwater right certificate (83629), which authorizes the use of up to 10.0 cfs from two wells. Appropriation of water under Certificate 83629 is further limited to up to 5.34 cfs from Cascade Well 3 and up to 8.97 cfs from Cascade Well 4. Generally, Certificate 83629 provides the District with a reliable groundwater supply. The groundwater source for this water right is the SGA, which is a deep, relatively productive, regional aquifer in the Portland basin. An evaluation of this aquifer, based on reported static water levels, indicates that groundwater levels in the SGA are relatively stable. In addition, according to the OWRD watermaster, there is not a history of regulation of groundwater rights in this area. Some well-to-well interference between Cascade Wells 3, 4, and 5 occurs, and when PWB is pumping its SGA production wells in the Columbia South Shore Well Field at high rates during certain times of the year, the additional interference at the Cascade Well 4 forces the District to limit the use of Well 4. The District and City are evaluating modifications to the well that could increase its reliable capacity by lowering the pump and installing a variable frequency drive, so the flow rate can be reduced to account for excessive drawdown, rather than forcing the District temporarily to shut down the well.

The District also holds one groundwater permit (G-16917), which authorizes the use of up to 53.5 cfs. The District obtained an extension of time to October 1, 2047, to complete development of this permit. Permit G-16917 authorizes the appropriation of groundwater from the SGA. As part of the permit extension process for this permit, OWRD included an interference condition that could require the permit holder to discontinue or reduce groundwater appropriation if withdrawal under the permit causes substantial interference with a senior water right. As described above, this aquifer is not currently experiencing water level declines or

frequent interference issues. Further, in much of this area, additional development of water rights is not expected to result in senior water rights experiencing substantial interference due to the relatively low maximum authorized rates of the senior water rights. Nonetheless, the District and City evaluate the likelihood that interference with senior water rights will occur as part of the site selection and design process for each new production well. If the District's and City's use of water under the permit results in substantial interference with senior water rights, they will work with senior water right holders to develop plans to mitigate the interference, as needed. As a result, this permit is expected to provide the District with a reliable water supply. Use of water under this permit is currently limited by the capacity of the District's existing wells, Cascade 3, 4, and 5.

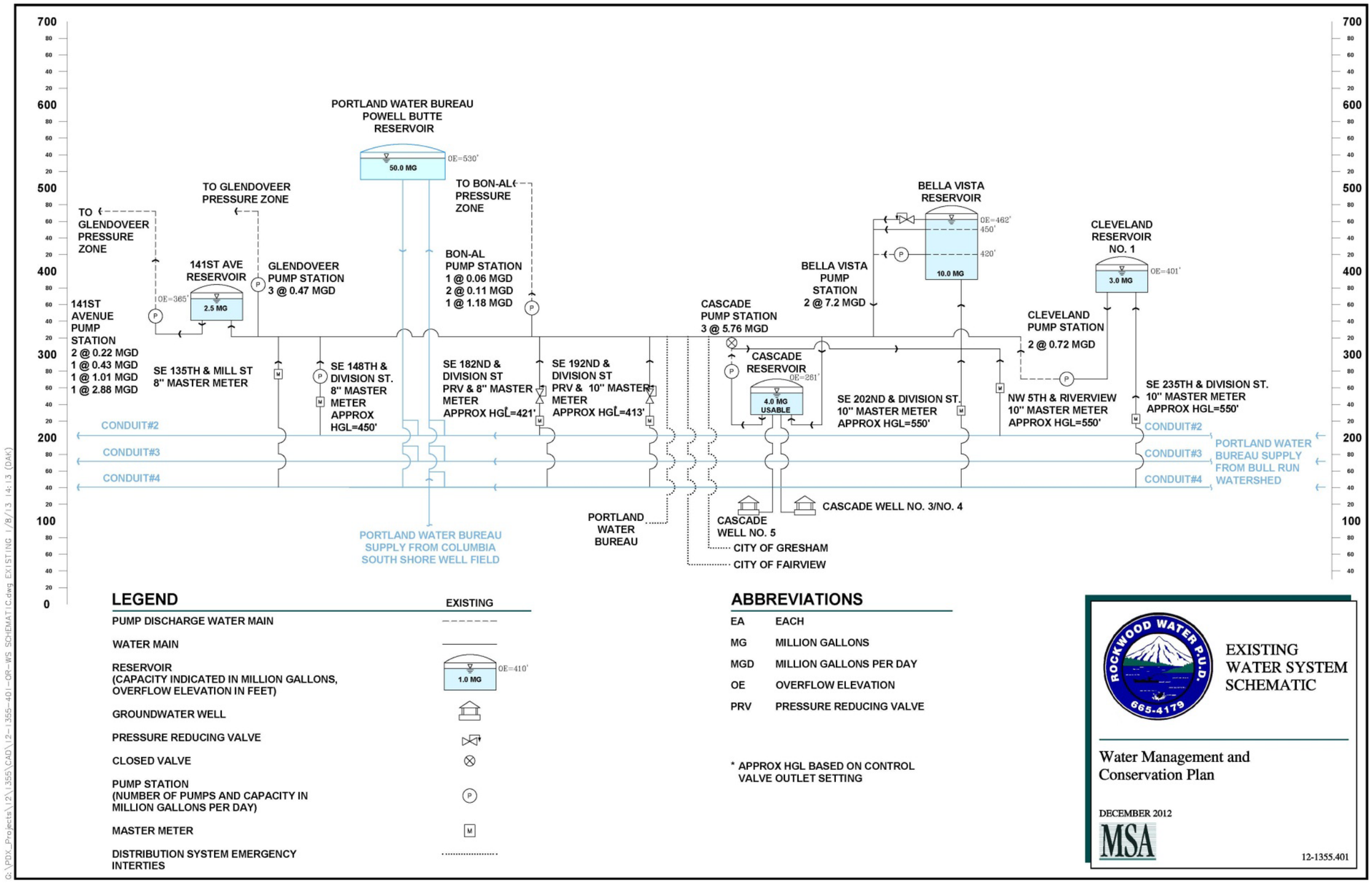
As previously described, the District has not received a permit for its Application S-72354, and it is uncertain whether a permit will ever be issued. For this reason, this application for the use of water from the Columbia River has not been considered as part of the District's existing water supply.

2.1.12 Existing System Description

The District operates a public drinking water system (Public Water System Identification Number is 4100668). Exhibit 2-17 is an engineering level system schematic of the District's existing water distribution system. A planning level system schematic is provided in Exhibit 2-2.

The District draws its base water supply directly from the PWB's Bull Run conduits through wholesale master metered connections. PWB operates three large-diameter steel supply conduits that carry water from the Bull Run watershed, located east of the District, west through the City of Gresham to supply the City of Portland and wholesale customers throughout the City of Portland metro area. The District receives water from the conduits as they pass through the City of Gresham and City of Portland, near the District's southern service area boundary before reaching PWB storage facilities at Powell Butte and Kelly Butte. During a high turbidity event or emergency at Bull Run, the District can receive groundwater from PWB's Columbia South Shore well field. The District can receive water from this back-up source of supply through the Powell Butte Reservoir south of the District. The District maintains seven master metered interconnections with PWB Conduit Nos. 2 and 4, primarily along SE Division Street on the District's southern border. These interconnections are shown in Exhibit 2-2.

Exhibit 2-17. Rockwood Water People's Utility District Engineering Level Water System Schematic



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The major components of the Cascade groundwater system currently include three wells jointly managed by the District and City, a treatment facility, one reservoir, and a 30-inch transmission main that delivers water to the District's Bella Vista Reservoir. The wells consist of Cascade Wells 3 through 5 and are operated by Rockwood. Pumps at these wells send water via transmission lines to the jointly held treatment facility located at the wellsite of Cascade Wells 3 and 4. After treatment, water is stored in the adjacent Cascade reservoir then distributed to the District and City as needed. The District and City jointly own the Cascade Groundwater Treatment Facility and finished water reservoir. Operationally, all peak water demand beyond the base flow from PWB is supplied to District customers from its Cascade groundwater system in order to reduce wholesale water costs for the District.

The District water system contains five finished water storage reservoirs (including the nearly complete Cascade Reservoir No. 2) with a total effective storage capacity of approximately 19.9 MG (half of the total 10 MG capacity of the Cascade Reservoirs is reserved for the City of Gresham). The 10 MG Bella Vista Reservoir is the District's primary storage facility serving the Main Pressure Zone by gravity. (The District's distribution system is divided into four pressure zones: Main, Glendoveer, Cleveland and Bon-Al.)

Water is conveyed to customers in pipes measuring up to 30 inches in diameter and constructed of ductile iron, cast iron and steel with the majority of piping composed of ductile iron piping with a diameter of 6 or 8 inches. The total estimated length of piping in the service area is approximately 165 miles. Six pump stations maintain pressure within the District's distribution system.

2.1.13 Future Cascade Groundwater Alliance Water System

The District and City are in the planning and construction phases to expand the Cascade groundwater system to meet the District's and City's demands by 2026. In 2026, the District's and City's IGAs with PWB terminate, at which time the District and City will rely on water produced from the Cascade groundwater system to meet all demands. Additional wells, reservoirs, water lines, treatment systems, pumps, and other infrastructure appurtenant to this system will be constructed by that time in preparation for the transition from the use of PWB as the providers' primary source of supply.

2.2 City of Gresham

2.2.1 Water Sources

OAR 690-086-0140(1)

Similar to Rockwood, Gresham currently obtains its base water supply (7.5 mgd) directly from the PWB Bull Run conduits through wholesale master metered connections. During a high turbidity event or emergency at Bull Run, or during periods of high demand, the City can receive groundwater from the PWB Columbia South Shore well field that is backed through PWB's Powell Butte Reservoir south of the District. All of the City's water demands beyond the 7.5 mgd PWB base flow are supplied from the District's and City's Cascade groundwater system. The

Cascade groundwater supply system consists of the District's Cascade Wells 3 and 4, and Cascade Well 5, which is jointly owned and operated under an IGA between the District and City. These sources are described in more detail later in this section under System Description.

2.2.2 Intergovernmental Agreements

OAR 690-086-0140(1)

1. Regional Water Sales Agreement with the Portland Water Bureau

The City has an IGA with PWB for the purchase of water. The City's agreement specifies a guaranteed purchase quantity of 7.5 mgd. The City may purchase water over and above the guaranteed purchase quantity, termed "interruptible water," but PWB is not obligated to sell that interruptible water and may cease supplying it at any time. The agreement expires in 2026 and provides an option for renewal. The City has informed PWB that it will not renew the contract, instead will rely on water produced from the Cascade groundwater system. The City is evaluating options for emergency supplies, which may result in an IGA with PWB to provide access to available water if the Cascade groundwater system is not capable of meeting demands during emergency events.

2. Cascade Groundwater System Intergovernmental Agreements

Refer to Section 2.1.2 for a description of the IGAs between the District and City.

2.2.3 Interconnections with Other Systems

OAR 690-086-0140(7)

The City has multiple interties to its distribution system. The City has five PWB Bull Run source interties to its distribution system, five interties with PWB and the District to supply water on-demand to the City's non-contiguous South Shore Industrial Area. The City also maintains 15 emergency interties with neighboring water providers Lusted Water District, City of Fairview, City of Wood Village, and City of Troutdale, as well as PWB and the District. These emergency interties are shown in Exhibit 2-18. Interconnections with bi-directional capabilities allow either water supplier to receive or provide water.

Exhibit 2-18. City of Gresham Emergency Interties

Location	Connection with:	Supply Direction
SE 282nd Avenue and SE Powell Valley Road	Lusted Water District	Bi-directional
SE 282nd Avenue and SE Welch Road	Lusted Water District	Bi-directional
SE Orient Drive south of SE Welch Road	Lusted Water District	Bi-directional
NE Stark Street between 242nd and Rene Avenues	City of Troutdale	to Troutdale
SE Marie Avenue between SE 174th and SE 182nd Avenues	PWB	to PWB
W Powell Boulevard east of SE 174th Avenue	PWB	to PWB
NE 223rd Avenue and NE Glisan Street	Rockwood, Wood Village, and Fairview	to Rockwood
SE 182nd Avenue south of SE Haig Drive	Rockwood	to Rockwood
SE Burnside Street and SE 202nd Avenue	Rockwood	to Rockwood
NE Division Street and NE Cleveland (235th) Avenue	Rockwood	Bi-directional
SE 223rd Avenue and SE Ash Street	Rockwood	Bi-directional
SE 223rd Avenue and SE Stark Street	Rockwood	Bi-directional
SE 238th Avenue and SE Stark Street	Rockwood	Bi-directional
NW Burnside Road and NW Shattuck Way	Rockwood	Bi-directional
SE 226th Avenue and SE Morrison Court	Rockwood	Bi-directional

2.2.4 Service Area Description and Population

OAR 690-086-0140(2)

1. Service Area

The City's current water service area includes the southern and eastern portions of the City of Gresham and the non-contiguous South Shore Industrial Area at the City's northern boundary between the I-84 freeway and the Columbia River. This service area represents about two-thirds of the area within the City limits—the remainder is served by Rockwood. City residents outside of this water service area in the northwestern portion of the city limits, excluding the South Shore Industrial Area, receive water from the District. Exhibit 2-19 shows a schematic of the City's current water delivery area and water system.

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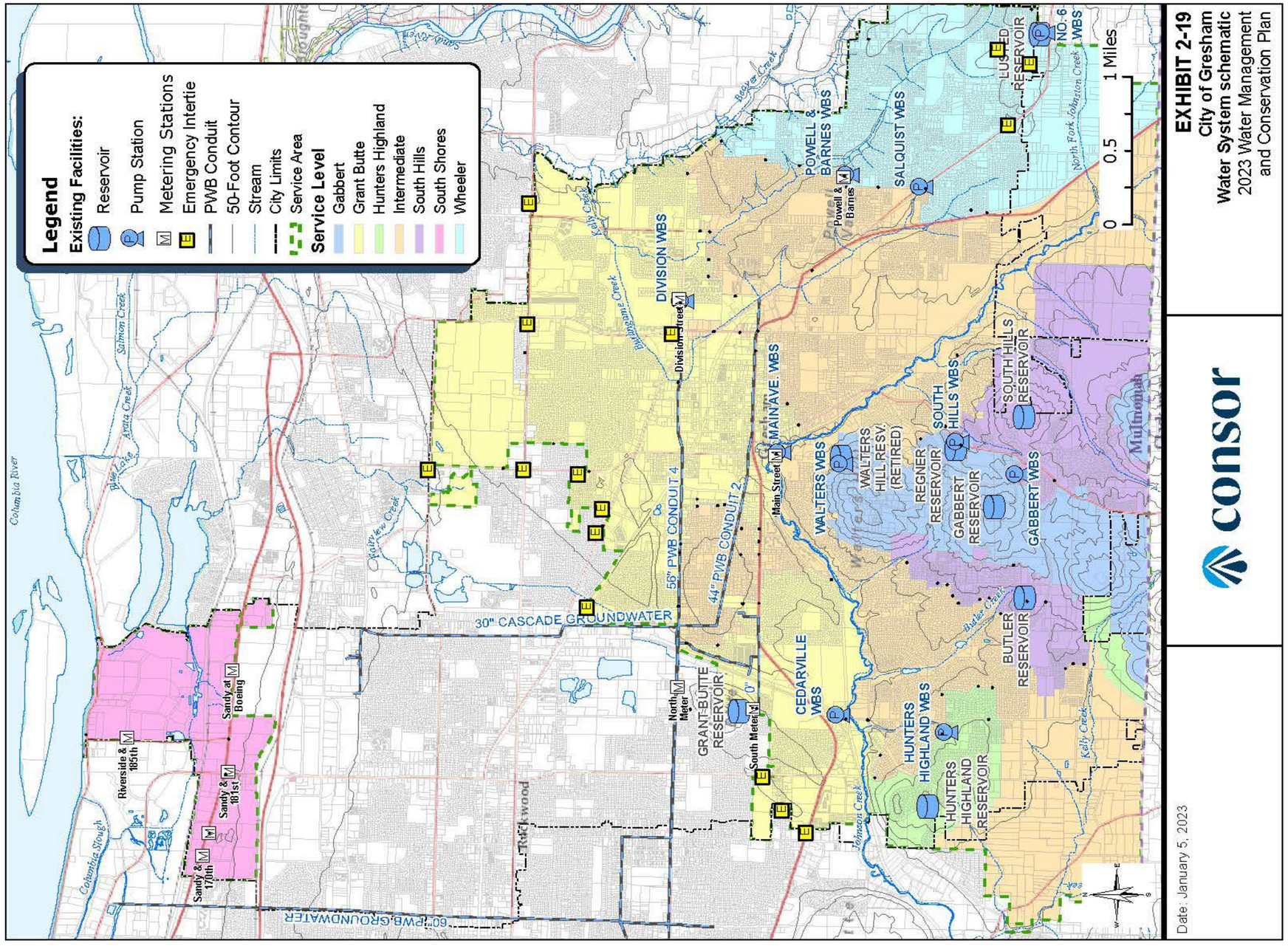
Exhibit 2-19. City of Gresham Water System Schematic



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2. Existing Population

The City's service area population was estimated to be 75,483 in 2021. The source of this estimate was a 2022 population study developed for members of the RWPC by the Portland State University's Population Research Center.

2.2.5 Definitions

The definitions described above in Section 2.1.5 for the District also apply to the City.

2.2.6 Historical Water Demands

OAR 690-086-0140(4)

1. Annual Demands

As previously stated, the term "water demand" refers to all of the water requirements of the system including residential, commercial, industrial, public use including fire hydrant meters, and institutional use, such as schools. For the purposes of this Plan, groundwater production and PWB wholesale purchase water will be referred to collectively as water demand.

Exhibit 2-20 summarizes water demand for the overall system, excluding the South Shore Industrial Area. As previously described, the South Shore Industrial Area, which is adjacent to the Columbia River on the City's northern boundary, is served from the PWB distribution system on-demand through five master meter connections. In addition, the City's Wastewater Treatment Plant in the South Shore Industrial Area is served by a metered connection to the District's water system. The water demands of the South Shore Industrial Area are considered separately because all customers in that area are supplied water directly from these master metered connections—the South Shore Industrial Area's distribution system is not connected to the City's distribution system, so the City cannot deliver water into this area.[6] Water supplied from PWB and the District to the South Shore Industrial Area is summarized in Exhibit 2-21.

As shown in Exhibit 2-20, during the period 2012–2021, the City's annual demand averaged 2,379.8 MG with the highest volume of 2,515.3 MG in 2012. During the same period, the City's ADD ranged from 6.24 mgd to 6.89 mgd, and the average ADD was 6.52 mgd. The MDD ranged from 9.53 mgd to 11.65 mgd, and the average MDD was 10.65 mgd. Data on water purchased for the South Shore Industrial Area was available by fiscal year. The values in Exhibit 2-21 show that the South Shore Industrial Area's annual demand for water provided by PWB and the District to the City's customers ranged from 6.4 MG to 15.6 MG from FY 2012/13 through FY 2020/21 and ADD ranged from 0.02 mgd to 0.04 mgd during the same period.

[6] Rockwood will serve this area for Gresham starting in 2026.

Exhibit 2-20. City of Gresham's Demands, 2012–2021

Year	Annual Demand (Water Produced and Purchased) (MG)	ADD (mgd)	MDD (mgd)	MMD (mgd)	MMD (MG)	Peaking Factor (MDD:ADD)
2012	2,515.3	6.89	10.8	10.74	332.8	1.6
2013	2,415.5	6.62	10.26	10.23	317.2	1.5
2014	2,345.9	6.43	10.11	9.35	289.8	1.5
2015	2,496.4	6.84	11.18	10.48	324.9	1.5
2016	2,366.5	6.48	10.22	9.29	288.0	1.4
2017	2,380.2	6.52	11.39	10.06	311.7	1.5
2018	2,395.2	6.56	10.89	9.91	307.3	1.5
2019	2,282.0	6.25	9.53	8.26	256.1	1.3
2020	2,276.0	6.24	10.43	9.47	293.7	1.5
2021	2,325.5	6.37	11.65	9.32	288.8	1.5
Average	**2,379.8**	**6.52**	**10.65**	**9.71**	**301.0**	**1.5**
Max	**2,515.3**	**6.89**	**11.65**	**10.74**	**332.8**	**1.6**

Exhibit 2-21. South Shore Industrial Area Demand, FY 2012/13–FY 2020/21

Year	Annual Demand (Water Supplied from PWB and the District) (MG)	ADD (mgd)
FY 2012/13	6.4	0.02
FY 2013/14	7.1	0.02
FY 2014/15	8.5	0.02
FY 2015/16	10.3	0.03
FY 2016/17	8.7	0.02
FY 2017/18	9.3	0.03
FY 2018/19	11.2	0.03
FY 2019/20	13.3	0.04
FY 2020/21	15.6	0.04

Exhibit 2-22 shows the City's annual demand from 2012 to 2021 based on data from Exhibit 2-20. During this period, annual demand trended down despite increases in population within the service area.

Exhibit 2-22. City of Gresham's Annual Demand (MG), 2012–2021

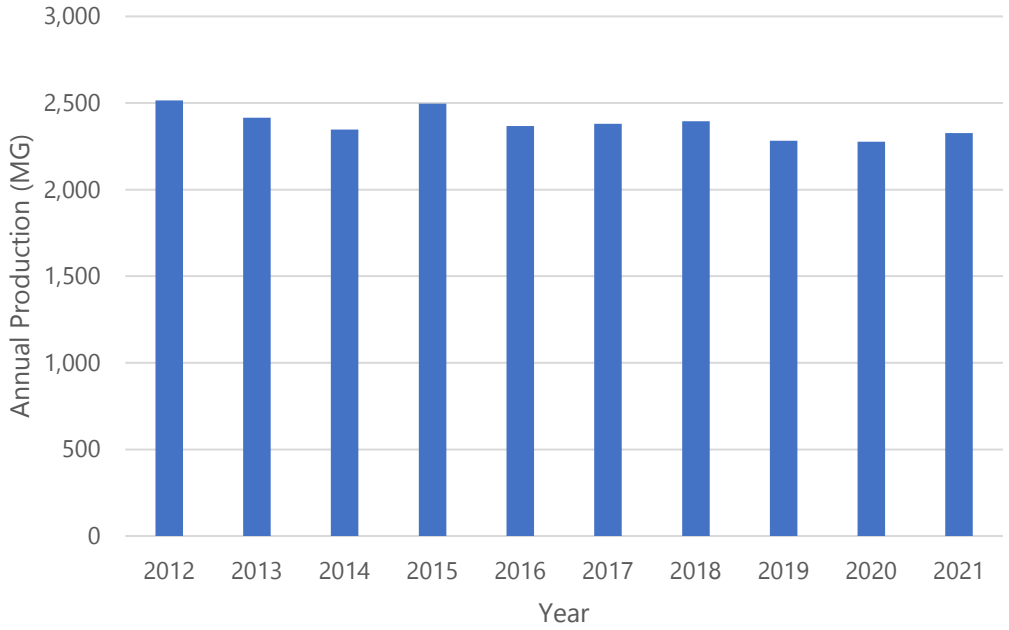
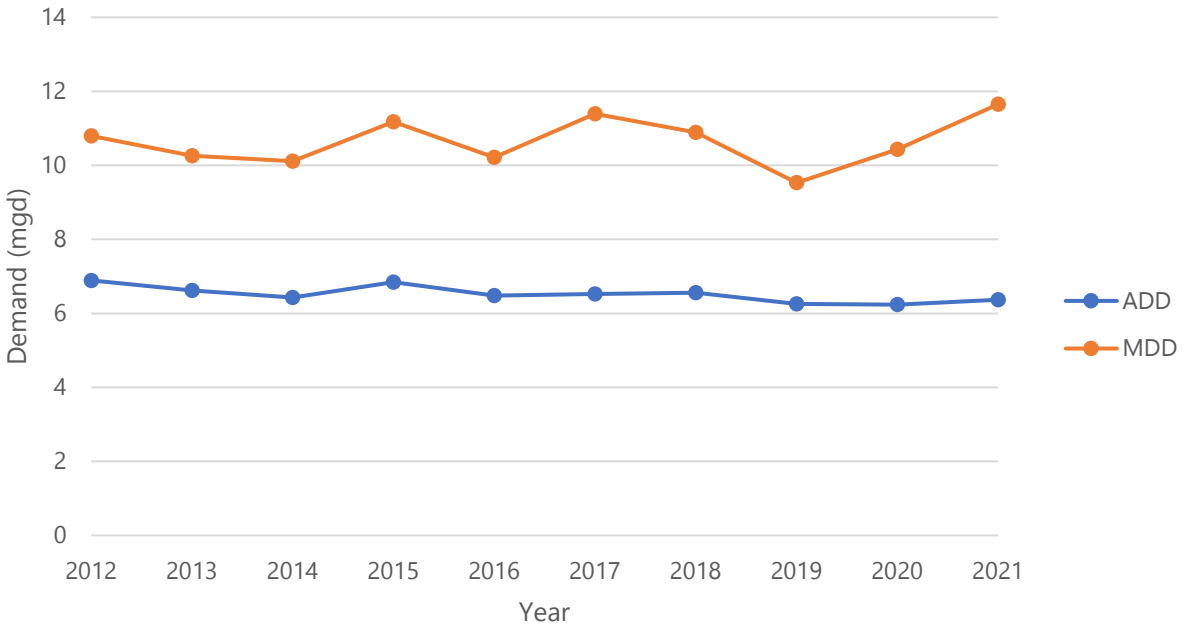


Exhibit 2-23 shows the City's ADD and MDD for 2012 to 2021. During this period, ADD decreased slightly while MDD fluctuated between approximately 10 mgd and 12 mgd, reaching a maximum of 11.65 mgd in 2021.

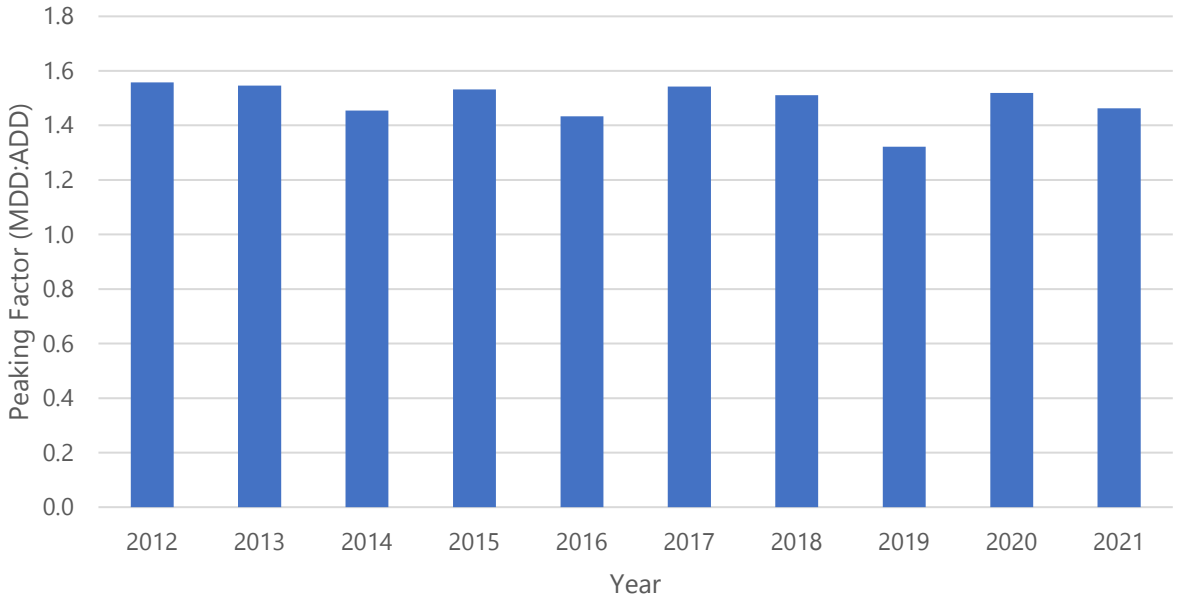
Exhibit 2-23. City of Gresham's Average Day Demand and Maximum Day Demand, 2012–2021



2. Peaking Factors

Exhibit 2-24 shows the City's peaking factors from 2012 through 2021. Peaking factors highlight seasonal differences, such that the greater the peaking factor, the greater the peak season use. During this period, the City's MDD to ADD peaking factor averaged 1.5 and generally ranged from 1.4 to 1.6. These peaking factors have decreased somewhat from the values reported in the previous WMCP. This value is slightly lower than most other Portland Metro area water utilities, such as those previously described. Monthly demand data, organized by season, also describes this seasonal difference in water use, as noted in the next section.

Exhibit 2-24. City of Gresham's Peaking Factors (MMD: ADD), 2012–2021



2.2.7 Monthly and Seasonal Demand

Exhibit 2-25 shows monthly demand data from 2012 to 2021 expressed as an average daily demand for the month, with the highest water use months of June through September. During this period, the highest monthly ADD recorded was 10.74 mgd in August 2012. Similar to the District, the City's water conservation efforts should continue to focus on uses during highest water use months.

Exhibit 2-25. City of Gresham's Monthly Average Day Demand (mgd), 2012–2021

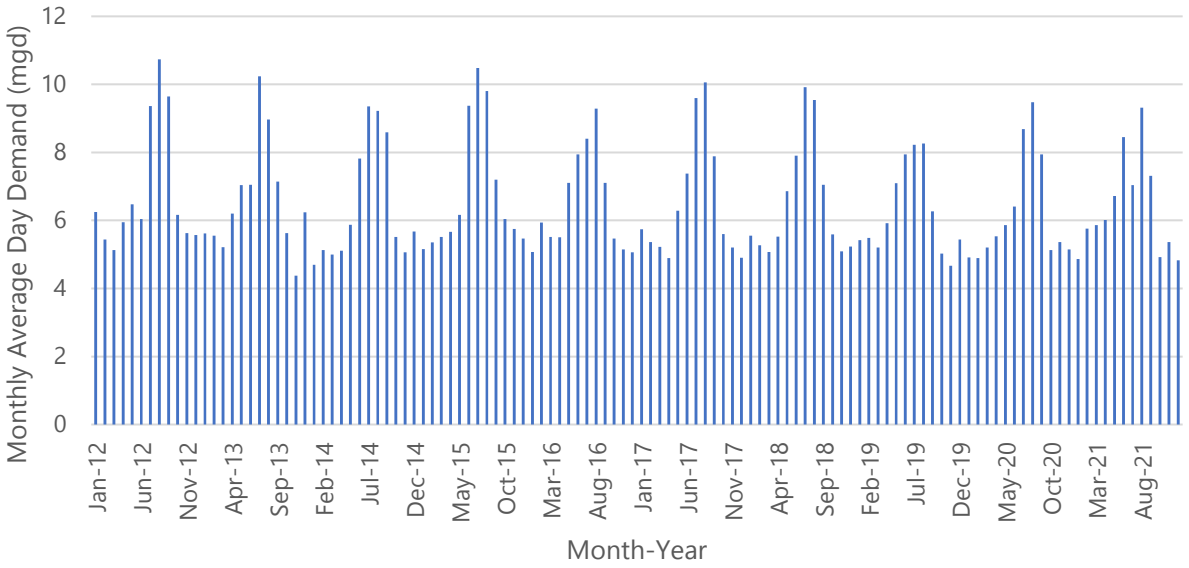
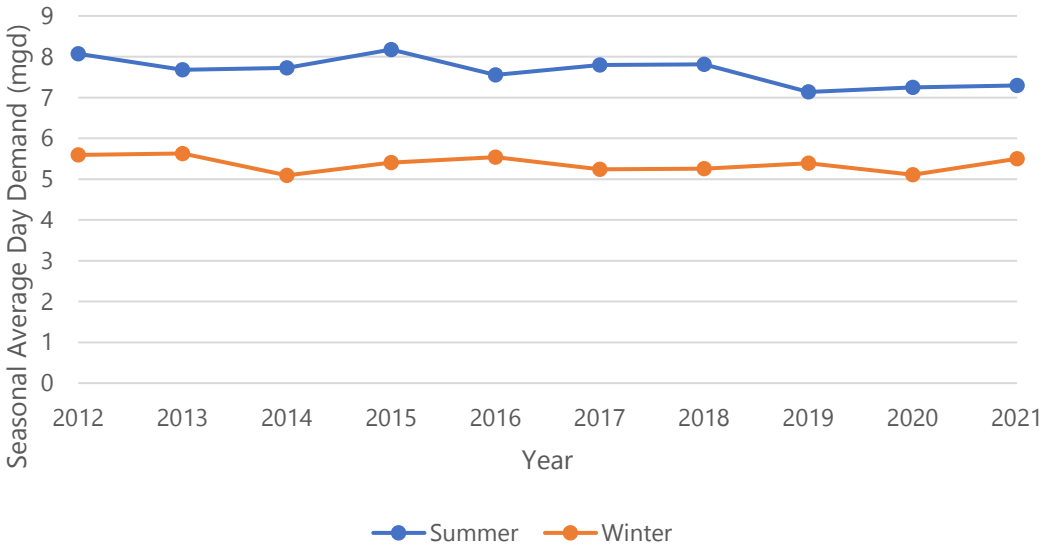


Exhibit 2-26 illustrates the summer period (defined as May through October) and winter period (November through April) ADDs for 2012 through 2021. As illustrated, the City's ADD is notably greater during the summer months, primarily because of outdoor water use, the bulk of which is used for irrigation. From 2012-2021, summer ADD ranged from 7.14 mgd to 8.18 mgd and winter ADD ranged from 5.09 mgd to 5.63 mgd. Over time, summer demand has generally decreased, while winter demand has remained fairly consistent. These trends are worthy of highlighting. The relatively flat winter demand suggests an actual decrease in per capita use in light of population increases within the City's service area over time. Similarly, the decreasing summer demands are important to recognize as well in the context of population growth.

Exhibit 2-26. City of Gresham's Historical Seasonal Demand (mgd), 2012–2021



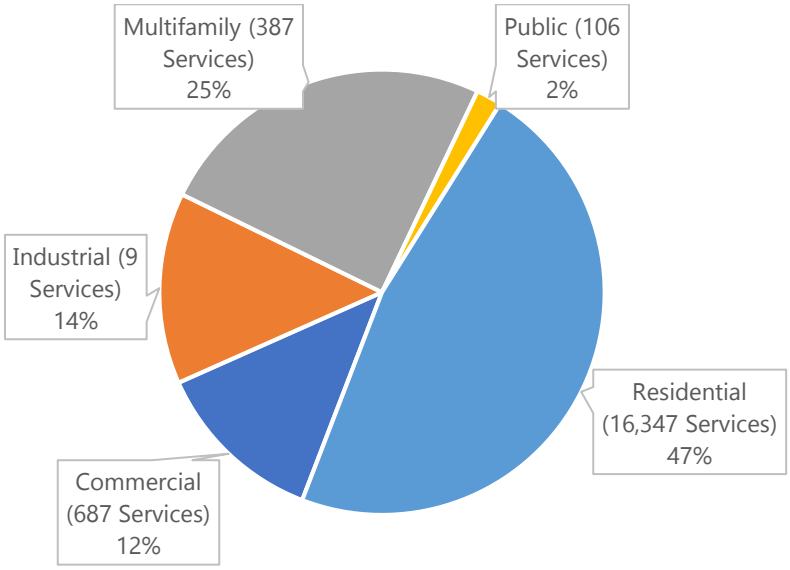
2.2.8 Customer Characteristics and Use Patterns

OAR 690-086-0140(6)

The City maintains historical water consumption records based on bi-monthly customer billing data. The consumption analysis presented in this section includes water consumption in the South Shore Industrial Area because the City is billed for water use at the PWB master meter connections and subsequently passes those costs through to customers in the industrial area. Therefore, these industrial customers are included in the City's billing data. The City tracks water consumption for five general customer categories: residential, multifamily, commercial, industrial, and public and institutional.

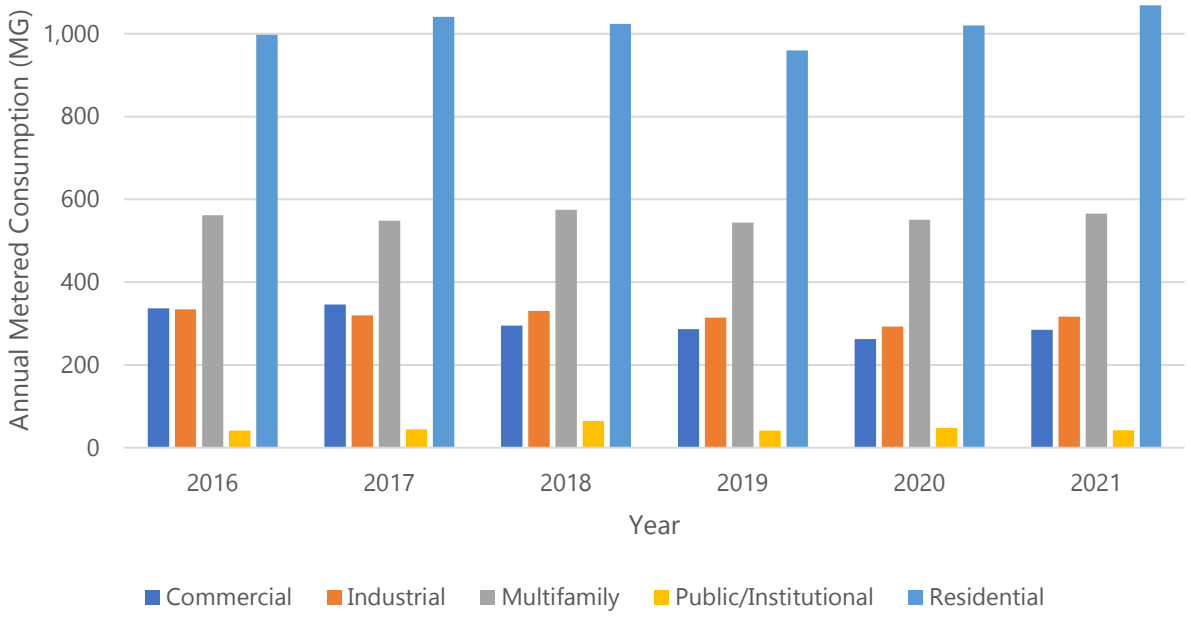
Exhibit 2-27 shows the number of City customer accounts by customer category and percent annual water use for 2021. Residential accounts include single family dwellings that are individually metered, duplexes, triplexes, and town homes. Multifamily accounts include mobile home parks and housing complexes larger than triplexes. Public and institutional accounts include City-owned properties, public schools, the community college, hospitals, churches, day care centers, and theaters/meeting places. Single family residential and multifamily water use represented the two largest water use categories, with 47 percent and 25 percent of total metered consumption, respectively. These percentages indicate that the water conservation opportunities may be greatest for residential users.

Exhibit 2-27. City of Gresham's Number of Accounts and Percent Annual Water Use by Customer Category, 2021



The City's annual metered consumption by customer category for 2016 through 2021 is shown in Exhibit 2-28. Most of the classes show annual fluctuations that result in generally flat trends over the 5-year period.

Exhibit 2-28. City of Gresham's Annual Metered Consumption by Customer Category, 2016–2021



1. Monthly Water Use

Exhibit 2-29 shows the City's estimated monthly consumption by customer category for the years 2016 through 2021. Consumption increases in the summer months on an annual basis for all the classes except for the industrial class for which consumption is largely in response to the economy. Seasonal increases are likely attributed to outdoor water use, or in the case of the Commercial class, outdoor water use and seasonal business cycles.

Exhibit 2-29. City of Gresham's Monthly Metered Consumption by Customer Category, 2016–2021

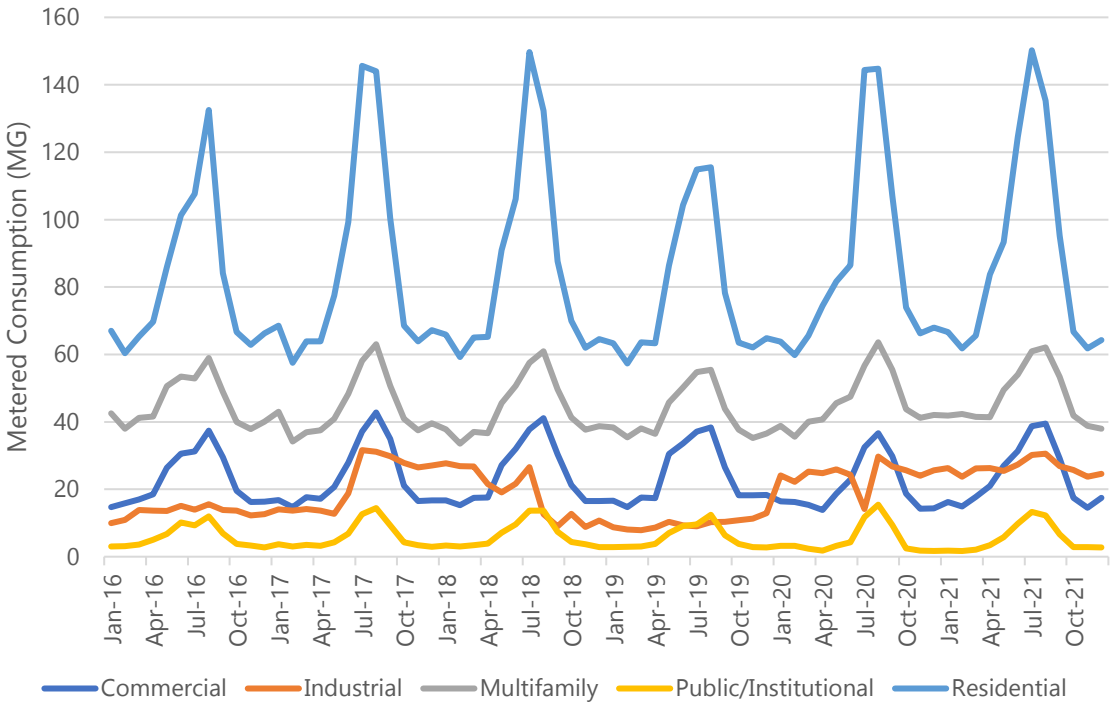
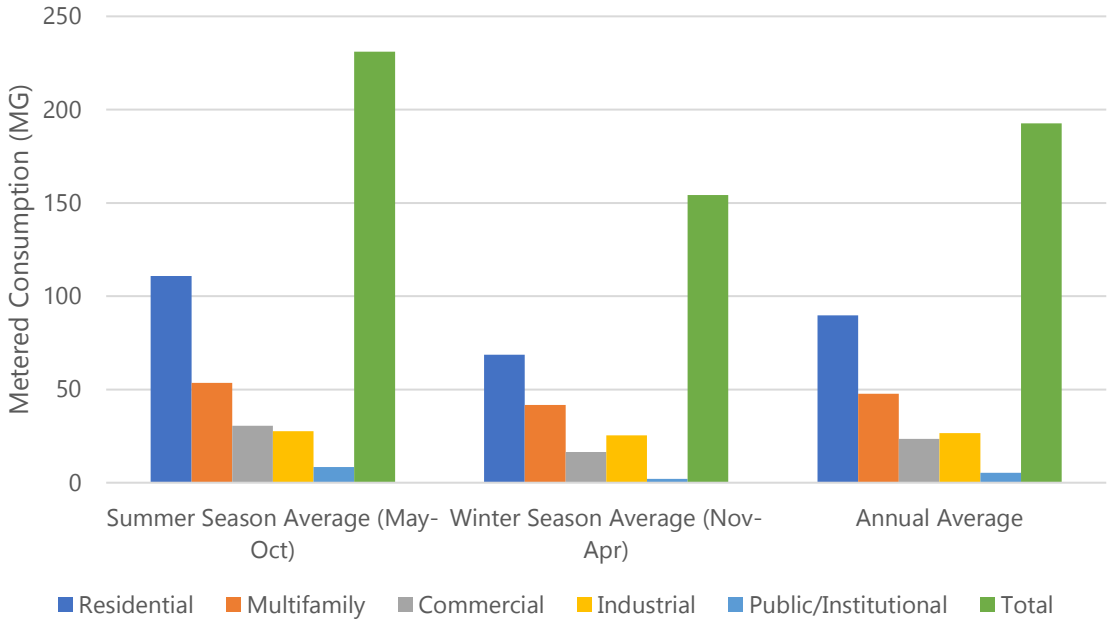


Exhibit 2-30 shows the City's average bi-monthly consumption by season and customer category for 2021. For the purposes of this WMCP, the summer months are defined as May through October and the winter months are defined as November through April, which are groupings influenced by the bi-monthly billing schedule. Public and institutional, commercial, and residential, water consumption had the greatest summer season to winter season ratios of 4.04, 1.86, and 1.61, respectively. These ratios suggest that water conservation efforts targeting residential, public and institutional, and commercial water uses in the summer season may produce notable water savings. Given that residential water users comprise the largest water consumption category, residential customers have been the focus of City and regional water conservation programs for over 20 years and will likely continue to be the focus of conservation programs for the foreseeable future.

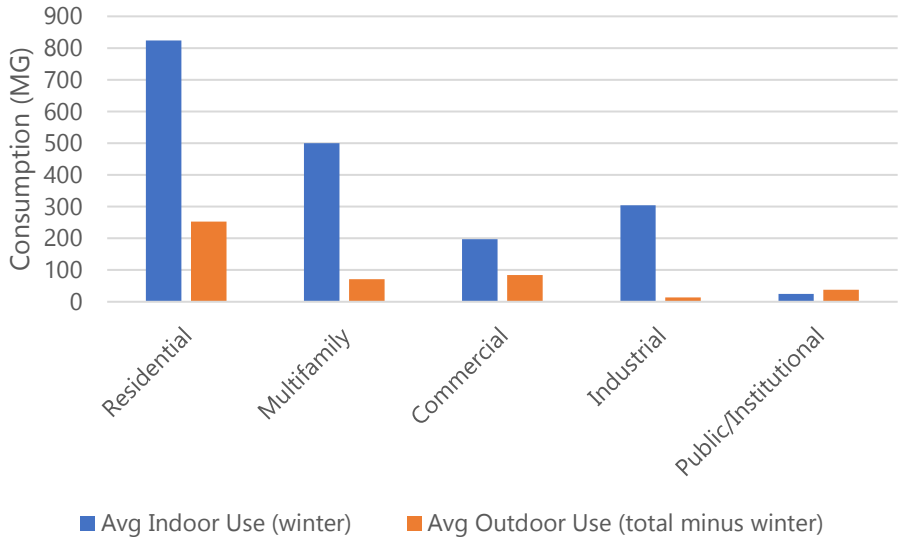
Exhibit 2-30. City of Gresham's Seasonal Water Consumption by Customer Category, 2021



2. Indoor and Outdoor Water Use

Estimates of indoor and outdoor water use by customers may provide information that helps the City target its water conservation efforts. The winter season average monthly use for each customer category was multiplied by 12 to estimate the average annual indoor use. The average winter season monthly figures used for this purpose were: 68.7 MG for residential, 41.7 MG for multifamily, 16.4 MG for commercial, 25.4 MG for industrial, and 2.1 MG for public and institutional. Subtracting the estimated average annual indoor use per customer category from the total annual use of each category yielded the estimated outdoor water use of each customer category, represented in Exhibit 2-31.

Exhibit 2-31. City of Gresham Indoor and Outdoor Water Use



Based on these calculations, estimated indoor water use for all customer categories (not shown in Exhibit 2-31) represented approximately 80.7 percent of total water use and estimated outdoor water use represented approximately 19.3 percent of total water use. Residential, commercial, and public and institutional users had the largest percentages of outdoor water use, with 22.1 percent, 30.0 percent, and 60.3 percent, respectively. Similar to the increases in outdoor water use reported for the District above, outdoor water use percentages among all City customer types in 2021 were higher than those shown in the previous WMCP. This is likely due to a combination of factors including successful water conservation programs targeting indoor use, much lower total precipitation in 2021 than in 2011 with accompanying increased need for landscape irrigation, and the unusual "heat dome" event in 2021.

3. Largest Water Users

Exhibit 2-32 lists the City's top 10 water consumers. These customers were responsible for use of 388.9 MG in 2021 or 17.1 percent of all consumption.

Exhibit 2-32. City of Gresham's Top 10 Water Consumers, 2021

Customer Type	Annual Volume Used (MG)	Percent of Annual Volume (%)
Industrial	219.9	9.7
Industrial	58.2	2.6
Multi-family	19.3	0.8
Industrial	14.4	0.6
Multi-family	14.3	0.6
Multi-family	14.2	0.6
Multi-family	13.8	0.6
Multi-family	11.8	0.5
Multi-Family	11.7	0.5
Multi-Family	11.2	0.5
Total	**388.9**	**17.1**

4. Historical Comparison of Consumption

Since publication of the joint District and City WMCP, the mix of accounts has remained stable for Gresham, with very little change in the ratios of customer classes served. For example, the City's largest class, the residential class, made up 47 percent of all connections served by the City in 2021 compared to 46 percent in 2011. The count of service connections increased from 2011 to 2021 for each class due to ongoing growth within the City's service area.

Consumption volumes by class in 2021 are consistent with consumption volumes shown from 2006 to 2011 except for the residential class, for which the City observed a decreasing trend in consumption over this 15 year period (2006 to 2021). From 2006 to 2011, annual residential consumption consistently exceeded 1,000 MG whereas from 2017 to 2021, residential consumption oscillated around 1,000 MG. Other characteristics of consumption described above for the years 2017 to 2021 generally were similar to those observed from 2006 to 2011, such as increases to metered consumption for nearly all classes during the summer months and the relative volumes of annual consumption for each class, however seasonal ratios for the public/institutional, residential, and commercial classes in 2021 were greater than those in 2011.

Total consumption values and residential consumption values presented in the City's 2018 progress report for the period 2013 to 2017 were greater than those identified in the 2013 WMCP update and this (2022) WMCP update. The City suspects that the progress report consumption values may have been greater than actual consumption as suggested by some negative water loss values shown in the progress report.

2.2.9 Water Losses

OAR 690-086-0140(9)

For the City, water loss is calculated as the difference between water system demand (which includes the South Shore Industrial Area's demand) minus authorized consumption, including consumption in the South Shore Industrial Area. The City's total water demand includes both groundwater from the Cascade groundwater system and PWB wholesale supply volumes that meet the majority of the City's demand. Authorized consumption includes metered consumption by customers, other metered authorized uses (wholesale water sold to other entities, water wheeled back to PWB [PWB customers served water through Gresham's system], and water usage from hydrants and at construction sites), and unmetered authorized uses (City water, stormwater, and wastewater operations; street sweeping, and firefighter training). Water loss includes apparent losses (i.e., unauthorized consumption, meter inaccuracies, and data handling errors) and real losses (i.e., system leakage). System leakage, as the name implies, is water loss from deteriorating or compromised pipes, pipe joints, service connections, and valves, among other sources. The City is not aware of any unauthorized consumption.

Exhibit 2-33 shows the City's water loss quantities and percentages for fiscal years 2016–2017 through 2020–2021. Data is presented by fiscal year because the City tracks authorized unbilled water uses (i.e., metered and unmetered authorized uses other than customer consumption) and South Shore Industrial Area water use by fiscal year. During the period shown on Exhibit 2-33, the City's water loss has ranged from 2.6 percent to 5.1 percent, averaging 4.0 percent. The City's water loss was 5.1 percent in FY 2020–2021.

Exhibit 2-33. City of Gresham's Historical Water Loss

Fiscal Year	Total Production (MG)	Customer Consumption (MG)	Other Authorized Consumption (MG)	Total Consumption (MG)	Water Loss (MG)	Water Loss (%)
2016/17	2,304.1	2,220.5	1.1	2,221.7	82.4	3.6
2017/18	2,419.5	2,331.5	6.7	2,338.2	81.2	3.4
2018/19	2,421.6	2,285.9	3.3	2,289.2	132.4	5.5
2019/20	2,158.8	2,086.1	16.9	2,103.0	55.8	2.6
2020/21	2,416.5	2,292.7	1.7	2,294.5	122.0	5.1
Average	**2,344.1**	**2,243.3**	**6.0**	**2,249.3**	**94.8**	**4.0**

2.2.10 Water Rights

OAR 690-086-0140(5)

As described above, the City's base municipal water supply is from PWB, and the City also obtains water from the Cascade groundwater system. Water is appropriated from this system under a certificate held by the District and a permit jointly held by the District and City, Permit G-16917. Exhibit 2-34 provides detailed information about the City's municipal water right that supplies potable water through its publicly owned municipal distribution system.

Information about non-municipal water rights held in the City's name is provided in Exhibit 2-35. The non-municipal use water rights authorize the use of non-potable water for a variety of purposes, including the use of wastewater for hydropower generation, and storage of water for purposes including aesthetics, recreation, pollution abatement, stormwater management. The City does not deliver water through its municipal distribution system for municipal customer supply under any of these water rights.

Finally, several water rights are appurtenant to City-owned property and were acquired through acquisition of the real property. These water rights are identified in Exhibit 2-36. Similar to the non-municipal water rights held in the City's name, these water rights authorize the use of non-potable water for a variety of purposes including irrigation, washing gravel, air pollution control, and storage of water from the City's sewer system. The City does not deliver water through its municipal distribution system for municipal customer supply under any of these water rights.

Exhibit 2-34. City of Gresham Water Rights for Potable Municipal Water Use

Source	Priority Date	Application	Permit	Transfer or Permit Amend-ment	Certificate	Type of Beneficial Use	Authorized Rate (cfs)	Authorized Volume (acre-feet)	Maximum Rate of Withdrawal to Date		2021 Average Combined (District and City) Withdrawal(1)		Five-Year (2017–2021) Average Combined (District and City) Withdrawal(1)		Authorized Date for Completion	Comments
									Instantaneous (cfs)	Annual (MG)(1)	Daily (mgd)	Monthly (MG)	Daily (mgd)	Monthly (MG)		
Groundwater; Well 1 (Cascade Well 5), Well 2, Well 3 (Cascade Well 6), Well 4, Well 5, Well 6 (Cascade Well 3), Well 7, Well 8 (Cascade Well 8), Cascade Well 4	12/21/1977	G-8585	~~G-8719~~ G-16917	T-10554 T-13274 (Pending)[2]	—	Municipal	53.50 (from up to 9 wells, including Cascade 3, 4, and 5)	—	11.8 cfs (3)	666.6	4.3	128.8	3.2	95.6	10/1/2047	Rockwood Water People's Utility District and City of Gresham's shared right—Rockwood assigned Gresham 18 mgd of this right. Following approval of Permit Amendment T-10554, OWRD issued superseding Permit G-16917

Footnotes
(1) This value is the combined withdrawal under the District's Certificate 83629 and the District's and City's jointly held Permit G-16917.
(2) Permit amendment T-13274 (currently under review at OWRD) proposes to change the location of one existing point of appropriation (Well 4) and to add three new points of appropriation to the permit (Cascade 7, Well 9, and Well 10)
(3) Based on the maximum pumping capacity of Cascade Well 5 of 7.6 mgd (11.8 cfs).

Note
The City (and District) expect to fully exercise Permit G-16917 by 2080, as noted in Section 5.3.

Exhibit 2-35. Non-Municipal Water Rights Held by the City of Gresham

Application	Permit	Certificate/ Claim	Source	Use	Priority Date	Authorized Rate (cfs)	Authorized Volume (acre feet)	Max. Rate/QuantityDiverted to Date	Authorized Date for Completion
—	—	GR-1791	Pump Well #1	Domestic and Irrigation of 76.48 acres	1936	0.13 (60 gpm)	35	N/A	N/A
R-71519	R-11452	—	Heiney Cr	Aesthetics or recreation	April 19, 1991	—	31.02 30.0 - Reservoir A 1.02 – Reservoir B	30.0 acre feet – Reservoir A 1.02 acre feet –Reservoir B	10/1/1995
R-81059	R-11969	80073	Kelly Cr	Storm water management, pollution abatement, wetland enhancement, recreation, and wildlife	April 9, 1996	—	Kelly Creek Regional Stormwater Detention Facility - 2.2	N/A	N/A
S-87548	S-54627	PC-891	"wastewaters treated by the City of Gresham and discharged to the Columbia River"	Hydroelectric production (99 THP)	July 13, 2009	29.0	—	N/A	N/A

Exhibit 2-36. Non-Municipal Water Rights Appurtenant to Property Owned by the City of Gresham

Application	Permit	Certificate	Source	Use	Priority Date	Authorized Rate (cfs)	Authorized Volume (acre-feet)	Portion Appurtenant to City Property (Approximate)	
								Rate (cfs)	Volume (acre-feet)
Groundwater Rights									
G-1237	G-1264	28022	groundwater	IR (3 Acres)	3/9/1959	0.04	7.5	0.04	7.5
G-825	G-847	30198	groundwater	Air pollution control	4/10/1958	1.78	—	1.78	—
G-1018	G-881	30315	groundwater	Gravel washing	6/24/1958	1.67	—	1.67	—
G-1127	G-1046	28943	groundwater	IR (76.5 Ac)	7/30/1958	0.40	191.25	0.17	80.3
Surface Water Rights									
R-17628	R-720	13544	Discharge from City sewage disposal, treatment plant and sewer system	Storage	10/11/1938	—	0.6	—	0.6
S-17576	S-13274	13517	Discharge from sewage disposal and treatment plant and sewer system and two reservoirs	IR (175 Ac)	9/9/1938	2.19	437.5	0.20	39.4
R-30735	R-1862	28265	Heiney Creek	Storage in Binford Res.	5/9/1956	—	30.0	—	30.0
S-30660	S-24173	28264	Heiney Creek/Binford Reservoir	IR (89 Ac)	4/11/1956	0.96	222.5	0.01	3.3
S-29230	S-23074	28126	Butler Creek	IR (30 Ac)	5/26/1954	0.19	75	0.03	10.0

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1. Aquatic Resource Concerns

OAR 690-086-140(5) requires the City to identify the following for each of these water sources: 1) any listing of the source as water quality limited (and the water quality parameters for which the source was listed); 2) any streamflow-dependent species listed by a state or federal agency as sensitive threatened or endangered that are present in the source; and 3) any designation of the source as being in a critical groundwater area. The City holds non-municipal surface water rights that authorize diversions or storage from Heiney (Butler) Creek as noted in Exhibits 2-35 and 2-36.

As part of a federal and state effort to protect Oregon streams from pollutants, every 2 years the Clean Water Act requires Oregon Department of Environmental Quality's (DEQ's) to assess or re-assess water quality and report to the Environmental Protection Agency on the condition of Oregon's waters. The Clean Water Act Section 303(d) requires the DEQ to identify waters that do not meet water quality standards and where a Total Maximum Daily Load pollutant load limit needs to be developed for additional regulation. In DEQ's 2022 Integrated Report, DEQ identified the Johnson Creek Watershed, which includes Heiney (Butler) Creek, as water quality limited. Johnson Creek is water quality limited for the following parameters: Dissolved oxygen and biocriteria. In addition, the watershed has TMDLs in place for temperature, mercury, bacteria, DDT, and Dieldrin.

There are no streamflow-dependent species listed by a state or federal agency as sensitive, threatened, or endangered associated with the City's municipal groundwater sources, however, some of the City's non-municipal water rights, authorize diversions from Heiney and Butler Creeks, tributaries to Johnson Creek, which is a tributary to the Willamette River. Exhibit 2-37 lists the sensitive, threatened, or endangered species that Gresham has identified in the Johnson Creek watershed.[7]

Exhibit 2-37. Listed Fish Species Potentially Located in Heiney (Butler) Creek

Species	Common Name	Federal Listing	State Listing
Oncorhynchus mykiss	Steelhead salmon	Threatened	Sensitive-Critical (Summer Runs), Sensitive (Winter runs)
Oncorhynchus kisutch	Coho salmon	Threatened	Endangered
Lampetra richardsoni	Western Brook Lamprey	—	Sensitive

The City's sources of groundwater supply are not located in a critical groundwater area.

[7] These species were identified during multiple electroshocking and habitat surveys performed by the City in the Johnson Creek watershed. No other listed species are known to be present.

2.2.11 Evaluation of Water Rights/Supply

OAR 690-086-0140(3)

The City obtains its base water supply from PWB. As described above, the PWB's Bull Run water supply is generally reliable, but it occasionally experiences high-turbidity events. Further, the PWB water supply could be affected in the event of a wildfire or earthquake in the Bull Run watershed.

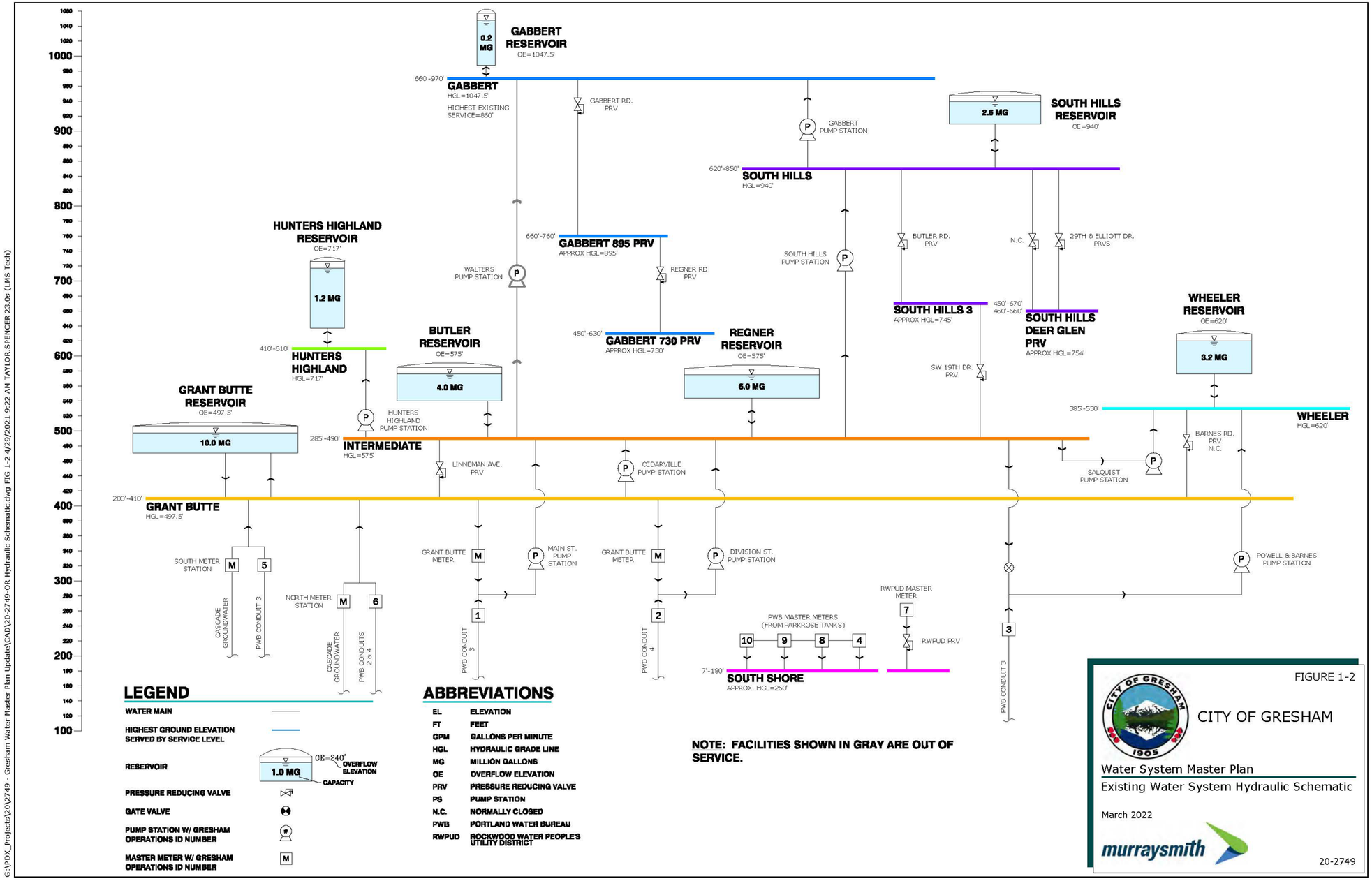
The District assigned to the City a 18.0 mgd portion of its Permit G-16917, which authorizes the use of groundwater from the SGA. As described above, the SGA is not experiencing water level declines or frequent interference issues. As a result, this permit is expected to provide the City with a reliable water supply.

The City's other water rights are for minor uses such as aesthetics, recreation, hydroelectric production, and stormwater management. These water rights do not affect the City's municipal water supply. Finally, the City acquired water rights when it purchased properties to which they are appurtenant. These rights are for uses such as air pollution control, gravel washing and irrigation. Further, the groundwater rights appropriate water from a shallow, relatively vulnerable aquifer. Therefore, the City does not currently intend to use these water rights for municipal water supply. Consequently, these water rights are not evaluated as part of the City's water supply.

2.2.12 System Description

The City operates a public drinking water system (Public Water System Identification Number 4100357). Exhibit 2-38 is an engineering level schematic of the City's existing water distribution system. As previously stated, the City draws the majority of its water supply directly from PWB Bull Run conduits through wholesale master metered connections. The City also owns and operates service meters in the South Shore Industrial Area. Water in this area is supplied through multiple master meter connections directly from the PWB's distribution system and the District without passing through the City distribution system. The City also continues to participate in development of the Cascade groundwater supply system in cooperation with the District, which is independent of PWB's system.

Exhibit 2-38. City of Gresham Water System Engineering Schematic



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The City receives water from three PWB conduits as they pass through the City's service area before reaching PWB storage facilities at Powell Butte and Kelly Butte. During a high turbidity event or emergency at Bull Run, or during periods of high demand, the City can receive groundwater from PWB's Columbia South Shore well field that is back-fed through the conduits. The City maintains five master metered connections with the PWB conduits and four master metered connections with PWB distribution mains in the South Shore Industrial Area.

Cascade Wells 3, 4, and 5 are used to augment the base water supply from PWB during periods of peak water demands to reduce wholesale water costs and to reduce dependence on groundwater from PWB's well field during emergencies. These three wells are the only wells currently in use by the District and City to meet demand. Well water is disinfected at the jointly owned City-District groundwater treatment facility and stored in the adjacent Cascade Reservoir, which acts as a clearwell for the treatment facility.

From the Cascade Reservoir, groundwater is supplied through a jointly owned City-District 30-inch diameter dedicated transmission main to the City's North and South Meter Stations and the District's Bella Vista Reservoir. Groundwater transmission mains to the meter stations are isolated from the PWB supply system in order to provide an independent secondary water source. At the North and South Meter Stations, groundwater can be mixed with PWB water at the inlet to Grant Butte Reservoir before gravity distribution to City customers.

The City has seven active water storage reservoirs serving the City's service levels with a total capacity of 27.2 MG. Gresham's water distribution system relies on nine pump stations to distribute water to the City's seven service levels.

Water is conveyed to the City's customers with approximately 280 miles of water transmission and distribution mains.

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3. Water Conservation

This section addresses the requirements of OAR 690-086-0150(1) – (5).

This rule requires a description of specific required conservation measures and benchmarks, and additional conservation measures implemented by the District and City.

3.1 Conservation Progress Reports

OAR 690-086-0150(1)

This is the District and City second WMCP. OWRD approved the District's and City's jointly submitted WMCP in 2013. Exhibit 3-1 provides a status update on the District's 5-year water conservation benchmarks in its 2013 WMCP and Exhibit 3-2 presents a similar status update for the City's benchmarks.

Exhibit 3-1. Rockwood Water People's Utility District's Conservation Measure Benchmark Status

Conservation Measure	Requirement	2013 WMCP Benchmarks	Benchmark Progress (as of 2018)	Benchmark Progress (as of 2022)
Annual water audit	A systematic and documented methodology for estimating any un-metered authorized and unauthorized uses, and an analysis of the water supplier's own water use to identify alternatives to increase efficiency.	Continue to conduct annual water audits. Analyze sources for and develop a plan to decrease unaccounted for water to 15% or less.	Rockwood meets this benchmark: Unaccounted for water has been reduced to 13.37%. Sources of unaccounted for water have been analyzed and over 60 leaks repaired. Rockwood is implementing a Water Audit and Loss Control Program as outlined in AWWA Manual M-36. Rockwood is audited annually to verify compliance with accounting standards and Oregon Municipal Audit Law. They have 'clean' opinions from auditors for the last 5 years.	Continues to conduct annual water audits. The District determined that a major contributor to its water losses is leaky 6- to 8-inch steel pipes. Ongoing replacement of these lines has helped reduce losses over time. The District tracks unmetered operational uses (leaks, flushing, washing down streets, cleaning/draining tanks) and uses this data in calculations of its water losses.
System metering	If the system is not fully metered, a program to install meters on all un-metered Water Service Connections.	Continue to meter all new service connections.	Rockwood meets this benchmark: All of its service connections are metered. It also requires contractors accessing bulk water from fire hydrants to first check out a calibrated meter.	Rockwood meets this benchmark: All of its service connections are metered. Added meters to discharge lines for water analyzers, and metered bulk filling station. Continues to require contractors accessing bulk water from fire hydrants to rent a calibrated hydrant meter.

Conservation Measure	Requirement	2013 WMCP Benchmarks	Benchmark Progress (as of 2018)	Benchmark Progress (as of 2022)
Meter testing and maintenance	Implement a meter testing and maintenance program.	Improve asset management of all meters through constant monitoring of the system, testing, upgrades, and repairs of meters based on consumption, failure rate, age, accuracy, and cost. Continue to repair or replace meters as they fail.	Rockwood meets this benchmark: 30 large meters are tested, and 400 small meters are replaced each year. Rockwood continues to check meters every two months and repair or replace them as needed.	Rockwood meets this benchmark: Half of large meters are tested bi-annually, all large meters have been upgraded/replaced and an average of 300 small meters are replaced each year (2018–2022). Rockwood continues to check meters every billing period for unusual water use and repairs or replaces faulty meters as needed.
Rate structure		Continue to charge bi-monthly service and consumption charges, based on meter size and quantity of water measured at connections. Review water service and consumption charges and rate structure.	Rockwood meets this benchmark: Rockwood continues to charge customers bi-monthly service and consumption charges. Rockwood conducted a Cost-of-Service Analysis (COSA) in 2018. The Board adopted a 10.5%/2.5% rate alternative on March 28, 2018. Each year Rockwood performs a Financial Plan update to ensure water revenue is sufficient to meet operational and capital programming needs.	Rockwood meets this benchmark: Rockwood continues to charge customers based, in part, on the quantity of water used. Rockwood implemented rate adjustments based on an annual Financial Plan and Rate Model update in order to prepare the District to fund debt service for a Groundwater System Expansion. The Board adopted the following rate adjustments effective on July 1 of each fiscal year: 2019: 5.75%, 2020: 12.5%, 2021: 10.5%, 2022: 5.1%.

Conservation Measure	Requirement	2013 WMCP Benchmarks	Benchmark Progress (as of 2018)	Benchmark Progress (as of 2022)
Public education	A public education program commensurate to the size of the Municipal Water Supplier to encourage efficient indoor and outdoor water use that includes regular communication of the supplier's water conservation activities and schedule to customers	Evaluate the feasibility of orienting public education towards Commercial, Industrial, Non-profit, and Public customers. Continue public outreach with RWPC.	Rockwood meets this benchmark: In 2014, Rockwood spread awareness to hotels about the EPA's hotel challenge, training videos, and other conservation information. Rockwood annually supplies free conservation devices to gyms, hotels, community gardens, and other businesses per request. It now provides water conservation shows for elementary schools in the service area, as well as the Schools Uniting Neighborhoods Program, Charter Schools, and libraries. Rockwood distributes conservation outreach materials at annual neighborhood association events. Rockwood continues public outreach with the RWPC.	Rockwood meets this benchmark: The District continues extensive outreach to customers, for example providing shows at schools, tables at local community events, and participates in RWPC public outreach activities. More information about its educational measures is provided below.

Conservation Measure	Requirement	2013 WMCP Benchmarks	Benchmark Progress (as of 2018)	Benchmark Progress (as of 2022)
Leak repair or line replacement	Describe leak repair or replacement program	Expand leak detection program to reduce unaccounted for water to 15% or less. Repair or replace waterlines with identified leaks. Survey areas with steel or cast-iron pipe and areas with unaddressed leak repairs. Monitor customer's consumption records for evidence of leaks and contact customers when leaks may be present.	Rockwood meets this benchmark: A 1/3-time employee is dedicated to leak detection. Unaccounted for water has been reduced to 13.37%. Between 2013 and 2017 Rockwood replaced 20,520 linear feet of waterline. 40.65 miles of pipe have been surveyed and 134 leaks have been repaired. Rockwood purchased new leak detection survey equipment in FY 2014/15. Consumption records of customers are monitored for evidence of leaks and customers are contacted about potential leaks each billing period.	Rockwood meets this benchmark: The District's water loss averaged 14.5% from 2017 to 2021. Between 2018 and 2022 Rockwood replaced 13,100 linear feet of waterline and 195 leaks have been repaired. Rockwood continues to survey pinpointed areas with vulnerable pipe for leaks. Between 2018 and2020 the District surveyed 278,000 feet of water main and services. Customers' consumption records are monitored for evidence of leaks and customers are contacted about potential leaks each billing period.

Conservation Measure	Requirement	2013 WMCP Benchmarks	Benchmark Progress (as of 2018)	Benchmark Progress (as of 2022)
Technical and financial assistance	Technical and financial assistance programs to encourage and aid residential, commercial, and industrial customers in implementation of conservation measures	Continue offering home water audits and toilet leak detection tablets. Analyze the feasibility of offering audits for commercial, public, and institutional water users, and financial incentives to users who install water saving devices.	Rockwood meets this benchmark: Rockwood offers referrals to home water audits by the Energy Trust of Oregon. It also offers Toilet leak detection tablets, efficient devices, and conservation kits for free per request. Rockwood sends training videos and information on performing water audits to commercial and public & institutional water users per request.	Rockwood meets this benchmark: Rockwood offers free conservation kits to the community, attends neighborhood meetings and public events to distribute the kits to the community. Customers can also come to the District and pick up conservation kits and devices.
Supplier financed retrofit or replacement of fixtures	Supplier financed retrofitting or replacement of existing inefficient water using fixtures, including distribution of residential conservation kits and rebates for customer investments in water conservation;	Continue to provide a toilet rebate program and conservation kits to customers. Investigate potential programs to retrofit or replace inefficient fixtures used by commercial, industrial, non-profit, and public customers.	Rockwood meets this benchmark: Rockwood continues to provide a toilet rebate program and conservation kits. It offers 2 toilet rebates per household and 3 per commercial and multi-family customers per year, with $50 per toilet replaced. It is registered on Home Depot and Lowe's website rebate center.	Rockwood meets this benchmark: The District offers a toilet rebate program and indoor and outdoor water conservation kits. Customers are also able to come in and request individual items as needed.

Conservation Measure	Requirement	2013 WMCP Benchmarks	Benchmark Progress (as of 2018)	Benchmark Progress (as of 2022)
Adoption of rate structures, billing schedules and other programs that encourage water conservation	Adoption of rate structures, billing schedules, and other associated programs that support and encourage water conservation	Same benchmarks as the earlier Rate Structure section. Additionally, evaluate the feasibility of regularly inserting conservation brochures in its billing statements.	Rockwood meets this benchmark (as described in the previous Rate Structure section). It also added a conservation program brochure to all customer water bills in 2014 and includes conservation messages in its newsletter.	Rockwood meets this benchmark: The District includes conservation messages in newsletters and billings, posts regular conservation messages on its social media, and participates in social media campaigns with the RWPC.
Water reuse, recycling, and non-potable water	Water reuse, recycling, and non-potable water opportunities	Investigate reuse, recycling, and nonpotable water opportunities with large commercial and industrial customers.	Rockwood meets this benchmark: Rockwood is a contributing partner in the Gresham Resource Efficiency Assistance To Green Business program, which helps businesses identify reuse opportunities. It distributes a brochure on rain barrels published by RWPC.	Rockwood meets this benchmark: continues to participate in the City of Gresham's Green Business program which provides options for reuse to program customers upon request.

Conservation Measure	Requirement	2013 WMCP Benchmarks	Benchmark Progress (as of 2018)	Benchmark Progress (as of 2022)
Other conservation measures	Any other conservation measures identified by the water supplier that would improve water use efficiency	Continue to be a part of the RWPC.	Rockwood meets this benchmark: Rockwood continues its membership in the RWPC and serves on the Conservation and Communicators Network committee. Rockwood has established additional measures: -In 2015, it became a partner in the EPA's WaterSense Program. -Rockwood contracts with a local theatre and educational group to provide conservation education to schools. -Rockwood's conservation website, which can be translated into 104 languages, provides links to the RWPC website.	Rockwood meets this benchmark by continuing its membership in the RWPC.

Exhibit 3-2. City of Gresham's Conservation Measure Benchmark Status

Conservation Measure	2013 WMCP Benchmarks	Benchmark Progress (as of 2018)	Benchmark Progress (as of 2022)
Annual water audit	Continue to conduct annual audits. Review accounting on non-authorized and authorized non-revenue water use to develop the best estimates possible.	The City meets this benchmark: Unaccounted for water remains below 10%.	The City meets this benchmark: Gresham continues to conduct annual audits. Unaccounted for water remains below 10%.
System metering	Continue to meter all service connections. All customer meters will have Advanced Metering Infrastructure (AMI) technology.	The City meets this benchmark: All Gresham customers have AMI. The City also continues to require meters for all development in its service area. The City requires contractors accessing bulk water from fire hydrants to first check out a calibrated meter, installed by City staff prior to using water from the hydrant.	The City meets this benchmark: Gresham continues to meter all service connections. All Gresham customers have AMI. The City also continues to require meters for all development in its service area. The City requires contractors accessing bulk water from fire hydrants to first check out a calibrated meter, installed by City staff prior to using water from the hydrant.
Meter testing and maintenance	Continue to conduct meter testing and maintenance, regularly monitor readings from the AMI technology, and make any adjustments to or replace faulty meters.	The City meets this benchmark: The City tests its source meters annually and repairs or replaces them as needed.	The City meets this benchmark: The City tests its source meters annually and repairs or replaces them as needed.

Conservation Measure	2013 WMCP Benchmarks	Benchmark Progress (as of 2018)	Benchmark Progress (as of 2022)
Rate structure	Conduct a Cost-of-Service Analysis (COSA), consider alternative rate models, and evaluate monthly billings.	The City hired a contractor in 2014 to assess the existing water rate structure. The City decided to invest in evaluation of fire flow charges due to these reasons: Water revenue was sufficient to meet operational and capital programming needs. Annual reviews of residential water use showed a pattern of decline. The water rate structure already included tiers for residential and dedicated irrigation use, which are intended to incentivize the reduction of summer water-use. The inclining tiered rates can be adjusted to reduce water use if summer supply becomes stressed. In 2015, the City conducted a residential wastewater rate structure review, which lead to implementation (in July 2016) of consumption-based rates. This rate structure helps incentivize the reduction of water use during the winter months. (Consumption-based wastewater rates had already been implemented for non-residential customers.)	The City hired a contractor in 2014 to assess the existing water rate structure. The City decided to invest in evaluation of fire flow charges due to these reasons: Water revenue was sufficient to meet operational and capital programming needs. Annual reviews of residential water use showed a pattern of decline. The City's water rate structure already included tiers for residential and dedicated irrigation use, which are intended to incentivize the reduction of summer water-use. The inclining tiered rates can be adjusted to reduce water use if summer supply becomes stressed. In 2015, the City conducted a residential wastewater rate structure review, which led to implementation (in July 2016) of consumption-based rates. This rate structure helps incentivize the reduction of water use during the winter months. (Consumption-based wastewater rates had already been implemented for non-residential customers.)

Conservation Measure	2013 WMCP Benchmarks	Benchmark Progress (as of 2018)	Benchmark Progress (as of 2022)
Public education	Evaluate existing outreach methods and consider Web-based tools to deliver information about water conservation and individual consumption history. Evaluate current printed outreach materials and opportunities to teach customers to troubleshoot water fixtures at home. Continue membership in RWPC.	The City meets this benchmark: The City website and social media has up-to-date water efficiency information, also published in newsletters. The City is still active in the RWPC. It provides a link to the RWPC on its website which has tutorials on troubleshooting water fixtures. Staff are members of the RWPC Conservation Committee. The City has distributed water efficiency devices to customers over the past 5 years. The City can provide bilingual water usage information online. Digital communications allow users access to data.	The City meets this benchmark: The City website and social media has up-to-date water efficiency information, also published in newsletters. The City is still active in the RWPC. It provides a link to the RWPC on its website which has tutorials on troubleshooting water fixtures. Staff are members of the RWPC Conservation Committee. The City has distributed water efficiency devices to customers over the past 5 years. The City can provide bilingual water usage information online. Digital communications allow users access to data.
Leak repair or line replacement	Continue leak detection and repair program, which aims to survey all City water pipes on a 5-year cycle and replace or repair leaking pipes.	The City meets this benchmark: It continues the leak detection and repair program and replaces and repairs service and main breaks as needed.	The City meets this benchmark: It continues the leak detection and repair program and replaces and repairs service and main breaks as needed.

Conservation Measure	2013 WMCP Benchmarks	Benchmark Progress (as of 2018)	Benchmark Progress (as of 2022)
Technical and financial assistance	Evaluate technical assistance programs with the goals of managing summer peaks and providing services to the community. Consider other assistance programs models for Single-Family, Multi-Family, Commercial and other customers.	The City continues its Green Business program, which provides water saving devices and education materials to an average of 28 local businesses per year. (Now called the Gresham Green Businesses program.	The City meets this benchmark: The City continues the Gresham Green Business Program, which provides water saving devices and education materials to an average of 28 local businesses per year. Over the previous 5 years, the City has expanded its financial assistance so that Multi-Family customers are now eligible for up to 10 toilet rebates per year.
Supplier financed retrofit or replacement of fixtures	Consider expanding outreach efforts for conservation kits and technical assistance. Evaluate efficacy of efficient fixtures programs and consider partnerships to deliver devices and services to customers.	The City meets this benchmark: Gresham has provided toilet replacement rebates since 2010, offering a $75 rebate per household, per toilet, up to two for Single-Family Residential and up to 10 for Multi-Family. In 2016, the program expanded to include both Single-Family Residential and Multi-Family customers. The City also continues to offer conservation kits to customers.	The City meets this benchmark: Gresham has provided toilet replacement rebates since 2010, currently offering a $50 rebate per household, per toilet, up to two for Single-Family Residential and up to 10 for Multi-Family. In 2016, the program expanded to include both Single-Family Residential and Multi-Family customers. The City also continues to offer conservation kits to customers.
Adoption of rate structures, billing schedules and other programs	Same as previous Rate Structure benchmarks	Same as previous Rate Structure section.	See Rate Structure section above.

Conservation Measure	2013 WMCP Benchmarks	Benchmark Progress (as of 2018)	Benchmark Progress (as of 2022)
Water reuse, recycling, and non-potable water	Continue to evaluate non-potable water opportunities and conduct a cost/benefit analysis on the feasibility of irrigating a sports complex with non-potable water from wells on City-owned property.	The City offers graywater reuse information from DEQ to customers, as well as a brochure on rain barrels from the RWPC. The City has a well and rights to the water at Gradin Sports Park. However, The City decided development of the well was cost prohibitive compared to using the existing public distribution system.	The City meets this benchmark: Gresham offers graywater reuse information from DEQ to customers, as well as a brochure on rain barrels from the RWPC. The City has a well and rights to the water at Gradin Sports Park and evaluated using it for irrigation purposes. However, the City decided development of the well was cost prohibitive compared to using the existing public distribution system.
Other conservation measures	Same as public education benchmarks	The City has implemented additional public education efforts, including: -Participation in the RWPC's annual media campaign, which includes indoor and outdoor water conservation messages -The use of web-based tools to deliver conservation information to customers -Sponsoring youth education assemblies -Participation in the annual Home and Garden Show -Providing conservation information through its Green Business program -Participation in the 2017 Mt. Hood Community College Conservation and Sustainability Fair -Offering weekly Evapo-transpiration information to customers through the RWPC.	The City has implemented additional public education efforts, including: -Participation in the RWPC's annual media campaign, which includes indoor and outdoor water conservation messages -The use of Web-based tools to deliver conservation information to customers -Sponsoring youth education assemblies -Participation in the annual Home and Garden Show -Providing conservation information through its Green Business program -Participation in the 2017 Mt. Hood Community College Conservation and Sustainability Fair -Offering weekly Evapo-transpiration information to customers through the RWPC

3.2 Regional Conservation Program Participation

Both the District and City have numerous conservation measures, many of which are implemented through RWPC. The RWPC was established in 1997 to address the need for regional water supply coordination and today consists of 25 water providers, including the District and City. The RWPC coordinates implementation and revision of the Regional Water Supply Plan, provides a forum for studying and discussing water supply issues, works to improve emergency preparedness, communicates RWPC policies and strategies to the public and stakeholders, and promotes water conservation.

The District and City have actively participated in the RWPC for over 20 years, including serving on the Consortium Board, Executive Committee, Consortium Technical Committee, and Consortium Conservation Committee.

The RWPC's conservation efforts include summer and winter marketing campaigns, focusing on outdoor and indoor water use, respectively; a website (www.regionalh2o.org); school programs; community events and partnerships; and public education and outreach. The marketing campaigns' content varies annually, but regularly includes television, radio, print and online media, and may include TriMet bus billboards and roadside billboards. RWPC's website features indoor and outdoor water conservation information, tips, children's activities, and links to other related resources.

RWPC supports the District's and the City's conservation programs in other ways as well. Through RWPC membership, the District and City receive discounts on water saving devices, help fund the Weekly Watering Number, and receive access to school classroom presentations performed by a contractor hired by the RWPC, Mad Science. Appendix B summarizes the many benefits that the District and City enjoy by being members of the RWPC.

3.3 Use and Reporting Program

OAR 690-086-0150(2)

The District's and the City's water measurement and reporting programs comply with the measurement standards in OAR Chapter 690, Division 85. The District's and the City's water use records can be found at http://apps.wrd.state.or.us/apps/wr/wateruse_report/.

The District and City have electromagnetic flow meters on their wells. The data from these meters is collected through the SCADA system and compiled annually for the purposes of water use reporting.

3.4 Required Conservation Measures

OAR 690-086-0150(4)(a)–(f)

OAR 690-086-150(4) requires that all water suppliers establish 5-year benchmarks for implementing the following water management and conservation measures:

- Annual water audit
- System-wide metering
- Meter testing and maintenance
- Unit-based billing program
- Water loss
- Public education

During the next 5 years, the District and City plan to initiate, continue, or expand these conservation measures to meet these requirements, as described below.

3.4.1 District Conservation Measures

1. Water Audit

OWRD defines a water audit as an analysis of the water system that includes a thorough accounting of all water entering and leaving the system. One of the results of an audit is identification of the volume of leakage in the system. The District conducts annual water audits that involve comparing source meter data to the sum of authorized metered water use and estimates of authorized, unmetered water use. This systematic methodology is documented in Section 2 of this WMCP.

The District periodically performs an analysis on its own water use to identify alternatives to increase efficiency. For example, the District installed a bulk metered water station for contractor use (for use during construction projects and other needs). Previously, bulk water use by contractors was not metered and Rockwood relied on contractors' estimates of water used. The new system eliminates the possibility of under-estimates of use. As another example, the District has installed low flow toilets at the District's main office.

Five-Year Benchmarks:

- Continue to conduct an annual water audit.
- Continue seeking ways the District can use water more efficiently.

2. System-wide Metering

The District's water system is fully metered, and all new service connections are metered. All non-emergency water sources, including all connections to the City of Portland and the Cascade

groundwater system wells are also metered. The District's emergency connections with other water providers are unmetered, but they are rarely used, mainly during valve exercises.

Five-Year Benchmark:

- Continue to meter all new service connections and primary sources of supply.

3. Meter Testing and Maintenance

The District has had a meter testing and maintenance program for over 30 years. Testing and maintenance protocol is based on service meter sizes. The District tests large meters bi-annually. Large meters are defined as having a diameter of 3 inches or larger. If a test reveals that a meter's accuracy is less than ±1.5 percent, the meter is calibrated, repaired, or replaced. The District maintains approximately 70 large meters in its service area. Most of these large meters were replaced within the previous 5 years.

The District evaluates performance of small service meters, defined as 2 inches or smaller in diameter, by relying on alerts generated by the District's utility billing (UB) system and customer requests. The UB system will alert District staff of potential under-registering of water consumption by meters by automatically comparing current volumes to historical volumes. Current volumes that are significantly lower than historical volumes indicate a potentially faulty meter. In addition, customers may alert the District's UB staff of faulty meters. Meter technicians check these meters onsite and meters that have failed are replaced immediately following inspections. Meters that have not failed but register inaccurate flow volumes are placed on a list and replaced on a quarterly work schedule.

In addition, each week the District reviews an exception report of customer meter reads that show excessive consumption (50 percent above their normal usage pattern). District staff attempts to visit with each of these customers and inspect the meters in question for leaks. If a leak is found and the customer is not available, a door hanger is left at the property that states that the customer has a possible leak and asks the customer to contact the District. If the leak is not evident, the customer is mailed a letter identifying the usage aberration.

The District budgets for replacement of 300 small failed, inaccurate, and old meters annually. Approximately 30 percent of the active small meters are older than 20 years of age. The District understands that meters that exceed 20 years of age tend to under-register flows. To quicken the pace of replacement of these old meters, the District intends to replace most of the small meters (older and newer alike) within the next two fiscal years. Replacement meters may be fitted with Advanced Metering Infrastructure (AMI), which will allow for remote collection of consumption volumes in real-time. A conservation-related benefit of AMI metering includes immediate detection of leaks, allowing for water savings resulting from quick identification and repairs. The District implemented a successful pilot program that installed AMI meters at a small number of District customers locations, encouraging the District to fund and implement the full system meter replacement program.

Master meters are located at interconnections with PWB and at Cascade wells. Meters at the City of Portland supply connections are maintained and tested by the City of Portland's PWB. Meters

located at Cascade Wells 3 and 4 are magnetic flow meters. These types of meters have no moving parts or flow obstructions, which virtually eliminates the need for maintenance. Meters at these wells are approximately 15 years old. Despite its age, the master meter at Well 4 will be replaced this fiscal year with a 16-inch magnetic flow meter in order to accommodate expected larger flows from this well following other well upgrades. The Gresham Meter Testing and Maintenance subsection in Section 3.4.3 of this WMCP provides a description of the master meter located at Cascade Well 5. Given that magnetic flow meters are virtually maintenance-free, the District is currently evaluating the need to establish a master meter maintenance schedule.

Five-Year Benchmarks:

- Continue testing large meters bi-annually and calibrate, repair, or replace if the meters exceed the District's meter accuracy standards.
- Continue to replace small meters as they fail or are found to inaccurately register flow.
- By FY 2024/25, develop and begin implementing a small meter replacement program if approved by the District Board of Directors.
- Determine if a master meter maintenance schedule is needed for Cascade groundwater system wellhead meters.

4. Unit-Based Billing

The District has a bi-monthly water service charge based on meter size and a consumption charge based on the quantity of water metered at service connections. The District adopted consumption-based rates more than 25 years ago. For FY 2022/23, the bi-monthly consumption charge is $3.20 per hundred cubic feet for users inside the District; users outside the District pay a 50 percent surcharge for water. Exhibit 3-3 shows the bi-monthly water service charges.

Exhibit 3-3. Rockwood Water People's Utility District Bi-Monthly Water Service Charge, FY 2022/23

Meter Size	Water Service Charge
5/8 inch	$27.38
3/4 inch	$41.09
1 inch	$68.47
1 ½ inch	$136.86
2 inches	$218.98
3 inches	$479.04
4 inches	$821.18
6 inches	$1,710.75
8 inches	$2,463.46
10 inches	$3,968.88

Fire meters are charged the 5/8-inch meter size rate. Also, two (or three) separate buildings on the same meter (2-user or 3-user) are charged twice (or three times) the meter charge.

Five-Year Benchmark:

- The District will continue to charge its customers a bi-monthly water service charge based on meter size and a bi-monthly consumption charge based on the quantity of water metered at the service connections.

5. Water Loss

The District's water loss was 18.9 percent in 2021, which is above the goal of 10 percent or less set by OWRD for water providers. The District's water loss is a result of a combination of both real and apparent loss types. Real losses are attributable to leaks in the pipes in the distribution system. The District conducted a distribution system-wide leak detection survey in 2019. Since that time, the District has been surveying sections of its distribution system, targeting areas with a history of frequent leak repairs, and then repairing or replacing the surveyed waterlines as needed. Between 2018 and mid-2022, the District discovered and repaired 195 leaks through the system-wide survey, the targeted surveys, and other methods. Rockwood intends to perform system-wide leak detection surveys approximately every 5 years.

The District is aware that aging steel pipes measuring 4 and 6 inches in diameter in its distribution system are the primary cause of real losses. The District's and City's 2013 WMCP noted that 8 to 10 percent of the length of the distribution system was comprised of these steel lines. The District's line replacement program has targeted these lines, consequently reducing the length of these steel lines in its system to approximately 10.6 miles, or approximately 6.4 percent of the distribution system. This remainder will continue to be a focus for the District's

line replacement program in the future. Copper service lines can also be a source of leaks and, therefore, these lines also are replaced (or repaired) during replacement of steel lines.

Apparent losses are another potential significant source of loss for the District. Apparent losses include consumption metering errors and unauthorized consumption. Rockwood's calculated loss for 2021 exceeded the next highest loss over the previous five years (2020, 14.5 percent) by 4.4 percent. Rockwood attributes this increase to an error in consumption volume introduced during the transition to a new utility billing system which occurred in 2021. This one-time apparent loss should not be replicated in future years and the District anticipates that future losses will be lower as a result.

While most of the large meters are less than 20 years of age, approximately 30 percent of the District's small meters are older than 20 years of age. Generally, the accuracy of a meter begins to degrade (typically under-registering use) after approximately 20 years of service. As meters degrade, the under-registering of use results in higher (apparent) losses. As noted above, the District intends to replace all small meters within the next two fiscal years, thereby improving meter accuracy. Additionally, the District tracks high water consumption, alerts customers of the potential of leaks, and inspects these meters with the intention of identifying leaks quickly and encouraging customers to swiftly repair these leaks. Rockwood is unaware of unauthorized connections.

OAR 690-086-150(4)(e) requires that a municipal water provider with water loss over 10 percent provide a description and analysis identifying potential factors for the loss and selected actions for remedy within 2 years of OWRD's issuance of a final order for this WMCP. If, after 5 years from approval of the WMCP, water losses are greater than 10 percent, the District will develop and implement a regularly scheduled and systematic program to detect and repair leaks in the transmission and distribution system, a line replacement program, or a water loss control program consistent with American Water Works Association's standards. To meet this rule, the District will provide a description and analysis to OWRD as required.

Five-Year Benchmarks:

- Continue to use survey equipment to identify leaks in segments of the distribution system and repair or replace identified leaks immediately.
- Perform system-wide leak detection surveys approximately every 5 years, with the next survey occurring in approximately 2024.
- Continue monitoring consumption records of customers for evidence of faulty meters and leaks and contact customers when records suggest that a leak may be present.
- Continue the aging, steel line replacement program.
- Within 2 years of issuance of a final order by OWRD for this WMCP, the District will provide a description and analysis to OWRD identifying potential factors for the loss and selected actions for remedy.
- If the District's remedies do not reduce loss to 10 percent or less within 5 years of

issuance of a final order by OWRD for this WMCP, the District will implement one of the three prescriptive options described in the rule (OAR 690-086-0150[4]).

6. Public Education

The District has a robust public education and outreach program that promotes water conservation through school programs, various forms of media, and community events.

The District, with assistance from RWPC, runs a Public School Water Conservation Program, which provides schools with classroom presentations for children grades K-12 that encourage water conservation, as well as classroom materials. Four classroom presentations were sponsored in 2018 and five in 2019, with none performed in 2020 and 2021 due to the pandemic. The District anticipates providing two classroom presentations per school during FY 2022/23 for a total of approximately 24. These presentations are performed by Mad Science, contracted through RWPC. These presentations include Where's the Water Watson and What Do You Know About H2O.

The District offers water conservation classroom materials for teachers and students, such as books, videos, CDs, maps, games, activity kits, and activity booklets. Titles of activity booklets include The Story of Drinking Water, About the Water Cycle, and Water Works Map. The District's website contains information on a variety of water-related educational programs, services, and materials. In addition, the District has a Mini Grant Program for schools that provides additional funds for teachers to enhance water-related education. The District is closely involved in the annual Children's Clean Water Festival as a member of the RWPC Conservation Committee, which helps organize the event.

In addition, the District produces print materials about water conservation. The District inserts a quarterly newsletter with conservation information upon publication with billing statements and occasionally inserts conservation brochures that provide tips for ways to reduce water usage. The tips, along with the District's public education program, show the link between water conservation and financial savings for the individual customer. Other print material includes water saving tips listed in Rockwood's Consumer Confidence Report, customer newsletters, and brochures, as well as on the District's website. As described in Section 2, outdoor water use presents a good opportunity for conservation measures. As a result, the District's brochures focus primarily on conservation related to outdoor water use. The following water conservation brochures are advertised on the District's website.

- Children's activity books and stickers.
- Simple Tips to Save You Water and Money: This guide identifies some simple and cost-effective changes that you can make to reduce your household's water consumption, while saving you money.
- H2O Indoor: A guide answering some of the questions we hear most often about indoor water conservation.
- H2O Outdoor: Simple tips to save water and money.

- 7 Basic Steps for Creating Water Efficient Landscapes: A 23-page guide for creating water efficient landscapes.
- Water-Efficient Plants for the Willamette Valley: This beautiful 45-page publication illustrates plants and planting techniques suited to our climate.
- Making the Most of Your Lawn Irrigation System this Summer: Water saving tips for automatic lawn irrigation systems.
- Water Conservation Guide for Multifamily Property Managers: Simple upgrades that will save you money, time, and water.

The District has been working to connect with community-based organizations, with a focus on those organizations serving historically underserved communities. In addition, outreach to its customers is more accessible due to recent efforts to provide language translation, ADA website revisions, measures to make written material more readable.

As community events restart following the pandemic, Rockwood has begun staffing a booth at these events. During the summer of 2022, the District attended National Night Out with the North Gresham Neighborhood Association and the I Love Rockwood event. At both events, the District provided indoor and outdoor conservation kits.

Five-Year Benchmark:

- Maintain its membership in RWPC and its current public education and outreach efforts.

3.4.2 District Additional Conservation Measures

OAR 690-086-0150(5)

OAR 690-086-0150(5) requires municipal water suppliers that either: (a) serve a population greater than 1,000 and propose to expand or initiate diversion of water under an extended permit for which resource issues have been identified, or (b) serve a population greater than 7,500, to provide a description of the specific activities, along with a 5-year schedule to implement several additional conservation measures. In 2022, the District served a population of over 7,500; therefore, OAR 690-086-0150(5) applies to the District.

- Technical and financial assistance programs
- Supplier financed retrofit or replacement of inefficient fixtures
- Rate structure and billing practices that encourage conservation
- Water reuse, recycling, and non-potable opportunities
- Other conservation measures

Conservation measures and associated 5-year benchmarks for these additional conservation measures are described below.

1. Technical and Financial Assistance

As previously noted, the District communicates with customers about potential leaks when meter readings show unusually high consumption and with customers concerned about water bills. District staff discuss leak identification methods to these customers to help control leaks.

Rockwood's website also includes tips for its residential customers to be more efficient users of water and links to the website of the RWPC, which has extensive conservation information and tips to reduce outdoor and indoor water use.

Five-Year Benchmarks:

- Continue to offer home water audits.
- Continue helping customers identify potential leaks and encouraging leak repair.
- Maintain water conservation tips on its website.

2. Supplier Financed Retrofit/Replacement of Inefficient Fixtures

The District is in its fourth year of a high-efficiency toilet rebate program. The program provides rebates to customers if the customers properly install a new Water Sense 1.28 GPF toilet and recycles old inefficient toilets. The District will provide up to two $100 rebates per single-family residential account and up to three $100 rebates per commercial customer account. From 2018 to 2021, the District provided an annual average of 42 rebates. The District budgeted for 120 rebates in FY 2022/23.

The District provides indoor and outdoor conservation kits free of charge to its customers. The indoor kit includes a showerhead, kitchen and bathroom faucet aerators, a shower timer, leak detection tablets, and Teflon tape for the showerhead. The outdoor kit includes a hose nozzle, hose repair parts, and a watering gauge. Customers can obtain these kits and/or individual components at the District office or by mail from the District. The District also distributes individual conservation devices separately from the kits, such as toilet flappers, fill cycle diverters, toilet tank bags, and hose timers upon request. From 2018 to 2021, the District distributed a total of 150 outdoor conservation kits and 75 indoor kits. From 2018 to 2021, an annual average of 179 devices were given away at community events and the Rockwood office. Devices include the same items found in the kits. The District provides toilet leak detection tablets to its customers, as well, which can be picked up at the District office.

The District has collaborated with various community groups and programs that include Human Solutions, Snow Cap, Neighborhood Associations, Head Start schools, and has provided conservation devices to these organizations.

Five-Year Benchmarks:

- Continue to provide a toilet rebate program
- Continue to provide water conservation kits and individual devices to customers.

- The District will investigate potential programs to retrofit or replace inefficient fixtures used by Commercial and Industrial, and Non-profit and Public customers.
- Continue providing toilet leak detection tablets.

3. Rate Structure and Billing Practices

As previously described, the District has a bi-monthly water service charge based on meter size and a bi-monthly consumption charge based on the quantity of water metered at the service connections. The District currently is not considering a change to a monthly billing schedule and instead is focusing its water conservation efforts on other programs, such as public education.

The District inserts a quarterly newsletter with conservation information when published in billing statements, and occasionally inserts conservation brochures that provide tips for ways to reduce water usage. The tips, along with the District's public education program, show the link between water conservation and financial savings for the individual customer.

Five-Year Benchmarks:

- Continue to charge customers a bi-monthly water service charge based on meter size and a bi-monthly consumption charge based on the quantity of water metered at the service connections.
- Continue to send newsletters with conservation information, and occasional conservation brochures, with billing statements.

4. Reuse, Recycling, and Nonpotable Water Opportunities

The District's largest customer, Microchip Technologies, Inc., currently practices reuse and recycling within its production processes. The District does not own or operate a wastewater treatment facility, which limits the opportunities for reuse or non-potable water use opportunities.

Five-Year Benchmark:

- In the next 5 years, the District will investigate reuse, recycling, and non-potable water opportunities with large commercial and industrial customers within its service area as they arise.

5. Other Conservation Measures

The District is a member of several organizations that work on water conservation issues. In addition to its membership with RWPC, the District is a member of the AWWA and the Pacific Northwest Section of AWWA's Water Conservation Committee. The District is also a promotional partner of the Environmental Protection Agency's WaterSense program. Through this program, the District can use program resources available to members, such as a listing of low-flow toilets that qualify for the program.

Five-Year Benchmark:

- Continue to be a member of the RWPC and other organizations that enhance Rockwood's ability to offer a robust conservation program to its customers.

3.4.3 City of Gresham Conservation Measures

During the next 5 years, the City plans to initiate, continue, or expand the following conservation measures that are required of all water providers.

1. Annual Water Audit

The City conducts a systematic, annual water audit. To conduct the audit, the City aggregates and compares its water demand (both water purchased from PWB, and water appropriated from the Cascade groundwater system) to the sum of authorized metered and unmetered water uses. (The City is unaware of unauthorized connections to its water system.) Authorized metered uses include consumption by its customers, wholesale water sold to other entities, water wheeled back to PWB, and water usage from hydrants and at construction sites. Unmetered uses include uses during City operations, including the operations of the Water, Stormwater, and Wastewater, and Transportation Divisions and the Fire Department, and occasional large leaks. Examples of uses include water system flushing, street and culvert cleaning, and water used for new line development.

The difference between demand and authorized metered and unmetered uses is water loss. The City's water loss is a combination of real and apparent losses, although the City has not conducted an analysis to determine how much of its water loss is attributable to either loss type. As described in Section 2, the City's water loss was 5.1 percent in 2021.

The City regularly conducts informal assessments of its own water uses to identify opportunities to use water more efficiently. As a result, the City has committed to repairing all leaks as soon as possible, usually between 24 and 48 hours, and the Water Division offers assistance to other City departments, such as Parks, Facilities, and Transportation, regarding leak repair or questions related to irrigation. As a means to save considerable volumes of water, the joint water treatment plant is planned to reintroduce most of the water used for backwashing the filters into the treatment process rather than releasing this backwash water to the wastewater stream.

Five-Year Benchmarks:

- Continue to conduct annual water audits.
- Continue to seek ways to increase the efficiency of its own water uses, including reintroducing most backwash water into the water treatment stream of the future water treatment plant.

2. System-wide Metering

The City's water system is fully metered. In the late 2000s to mid-2010s, the City replaced all service connection meters with meters fitted with AMI technology.

Five-Year Benchmark:

- The City will continue to meter all service connections.

3. Meter Testing and Maintenance

The City has an active meter testing and maintenance program. Testing is performed bi-annually for large meters, defined as 3 inches in size or greater. Meters exceeding the City's sensitivity range of ±3 percent are calibrated, repaired, or replaced, as needed. Small meters are not tested but are used until failure. Failure is defined as not registering flows or obviously not registering use accurately.

AMI technology enables the City to quickly identify notable changes in customer water use. When meters register ongoing irregular readings, the City's UB system sends alerts to UB staff. (Irregular readings are defined as consumption volumes that are unusually lower or higher than historical readings.) Within 72 hours of notification, City UB staff will send a letter to these customers and inform the Water Division's operations. Operations staff attempt to contact these customers to discuss the issue and will attempt to trouble-shoot a cause. Solutions include meter replacement if the meter has failed or, for large meters, meters may be repaired as needed. Water operations staff will attempt to determine if excessive use is a result of a leak(s). If a leak is suspected, staff will help the customer identify the cause (see Section 3.4.4 for further information). This process enables the City to quickly resolve meter errors and identify and help customers resolve leaks.

The City keeps a 20-year meter replacement schedule to ensure that meters do not exceed their lifespan. After 20 years, meters gradually become less sensitive to flows and typically under-register use. The City replaced all small meters (less than 3 inches in size) with AMI technology in 2009 and 2010 and replaced large meters 3 inches in size or larger in 2012 and 2013, also fitted with AMI technology.

The master meters measuring water entering the City's water system at PWB interconnections are maintained by PWB; PWB tests these meters annually. The City's master meter located at the City's wellhead (Cascade Well 5) was installed in 2010 and is within its anticipated lifespan. Cascade Well 5 has a new master meter that was installed this year. The City of Rockwood is charged with maintaining this meter and meters to be installed on future wellheads and is currently evaluating the need to establish a master meter maintenance schedule.

Five-Year Benchmarks:

- Continue to conduct meter testing and maintenance on its large service connection meters bi-annually and calibrate, repair, or replace out-of-specification meters as needed.
- Continue to monitor meter readings on an ongoing basis and repair or replace faulty meters as needed.

4. Unit-Based Billing

The City bills its customers bi-monthly. Each bill includes a monthly water service charge based on meter size and a consumption charge based on the quantity of water metered at the service connections during this period. The consumption charge is tiered for single family residential and dedicated irrigation customers. Appendix C shows these charges.

Five-Year Benchmarks:

- Within the next 5 years, conduct a cost-of-service analysis and review how expenses are allocated across the customer base. At the same time, the City will consider alternative rate models.
- Continue billing customers based, in part, on the quantity of water metered at all service connections.

5. Water Loss

Even though the City's annual water audits indicate that its water loss consistently is below 10 percent, the City has a systematic leak detection program. The program consists of three major efforts: AMI leak detection, pipe condition assessment, and acoustic leak detection.

AMI Leak Detection

As a result of the AMI technology upgrades to service connection meters, the City's primary means of detecting leaks on the City's customers' side of the meter is to monitor readings from the AMI technology. As previously described, the City's response to unusual meter readings is to investigate and repair or replace meters or inform customers of unusually high readings and help customers identify leaks.

Distribution System Laterals Acoustic Leak Detection

The City uses acoustic sensing technology for detecting leaks on lateral lines that might otherwise be difficult or impossible to find, thereby catching leaks before they surface or cause interruptions in service. Underground water leaks have particular sonic characteristics. This acoustic sensing technology analyzes water pipe acoustics and enables City staff to distinguish the sound of leaks from other environmental noises, such as traffic.

The process of using the acoustic sensing technology starts with City staff identifying a section of pipe to test. The City uses this equipment to test laterals running off the water mains. To identify potentially failing pipe segments to analyze, the City tracks water main leak locations and uses historical data to look for clusters or reoccurrences of leaks. Once a location is identified for testing with acoustic sensing technology, City staff places a specially built microphone/transmitter on each of two water valves on the pipe. Typically, the devices are placed 500 to 700 feet apart. The devices log audio frequency readings for a two- or three-hour period late at night when environmental noises are reduced. The next day, City staff collects the devices and analyzes the readings. If a leak is located, City staff unearths the pipe and repairs the leak or replaces the pipe, as appropriate.

From these periodic tests, City staff has found that most water pipes are not leaking. (Some leaks that were located could have taken years to find without the new acoustic sensing technology.) City staff will attempt to survey one-quarter to one-third of the City's lateral water pipes annually, thereby completing a survey of the entire system within 5 years. Efforts like this have helped the City achieve a system-wide water loss factor (non-revenue water) below 10 percent consistently, which are among the lowest results in the industry.

The City has also implemented measures to encourage customers to find and repair leaks. Customers are urged to contact the City when their bills appear too high, so that City staff can help them determine whether a leak is present. Under the City's Leak Adjustment Program, if a customer repairs a leak within 30 days after the leak is discovered, the customer may qualify for a bill adjustment. In addition, the City offers information about fixing leaks in indoor fixtures and irrigation systems through its website and at events. The City also offers toilet leak detection tablets in free water conservation kits available at any time upon request and at public events where City staff presents water conservation information.

Distribution Main Line Pipe Condition Assessment

The City performs annual pipe condition assessments on the City's water mains, coupled with a pipe replacement and repair program, to help prevent water line leaks from occurring. The purpose of the condition assessments is to determine the thickness of pipe walls in order to estimate the potential for pipe leakage. Over time, the thickness of pipe walls decreases, and thin pipe walls are a primary cause of leaks. The assessments consist of an acoustic survey performed by a contractor. The City performed the first assessment in 2013 and surveyed approximately 15,000 feet of distribution mains at that time. Since then, the City found that pipes installed in 1980 and earlier are more likely to exhibit enough wall thinning to suggest that leaks are imminent. Thus, the City currently focuses its assessments on pipes installed before 1981. Pipes in this age range make up approximately 42 percent of the distribution system. Of this 42 percent, the City has assessed approximately 20 percent. Pipes discovered to have 30 percent or more of pipe wall loss are placed on a list for immediate replacement. Following replacement of all thin-walled pipes installed previous to 1980, the City will start assessing pipes installed in the 1990s. The City currently tests 7 miles of pipe in its distribution system annually, for which the City has budgeted over $250,000 in FY 2022/23. In addition to the assessment, the City relies on main break history to determine which and when pipes should be replaced.

Overall, the City has an active water main replacement program and has installed or replaced 24 percent of the existing water system piping since 2000, including pipes discovered to exceed the City's 30 percent wall loss criteria during pipe condition assessments.

Five-Year Benchmarks:

- Continue monitoring customer usage and investigate and repair or replace meters found to be faulty or inform customers of unusually high readings and help customers identify leaks.
- Continue performing leak detection of the laterals within the City's distribution system at a rate of 20 percent of the laterals in the system per year.

- Continue performing water main condition assessments annually and replace pipes determined to be at risk for leaks based on pipe wall thickness.

6. Public Education

The City conducts education and outreach programs for a variety of customer types and age groups. Coordination with the RWPC and other City programs helps the City leverage resources to provide a wide variety of educational and outreach services to its customers.

Student Education

The City provides student programs for area schools. These are held in the students' classrooms. The one- to two-hour pre-planned lessons are tailored to meet specific curriculum goals related to the water cycle, water conservation, policies and regulation, and water quality.

Classroom plays and presentations are contracted out and provided to area schools. Examples of school programming include "Where's Rosie?" a water conservation puppet show for kindergarten to 2nd grade students. Following the play, an activity book is given to each student that follows the characters and plot line of the show to reinforce water conservation concepts. From FY 2011/12 to FY 2019/20, eight classroom presentations were performed. During school closures during the pandemic, the presentations were paused and resumed again in FY 2022/23 with the intention of providing six presentations per year.

The City also contributes to the effort to host the Children's Clean Water Festival. This one-day festival offers wide ranging and hands-on educational experiences to Metro area elementary school students at no cost to the schools. The City pays for transportation for Gresham students and provides assistance in planning and staffing the festival.

Residential Customers – All Ages

The City has used the Web, Facebook, Twitter, the annual Consumer Confidence Report, newsletters, community events (e.g., Clean Water Festival and East Gresham Community Information Fair), and neighborhood association meetings to promote residential conservation programs. As a member of the RWPC and RWPC's Conservation Committee, the City's residential customers also can learn about conservation through the RWPC's extensive conservation websites and the annual summer marketing campaign. The campaign kicks off in May during Drinking Water Week (promoted by the American Water Works Association) and is focused primarily on promoting efficient use of water outdoors, such as efficient irrigation practices. This theme is promoted through community events and a broad range of media, including radio, television, print ads, the Web, advertisements, and public service announcements.

In addition to the Consortium-sponsored summer conservation marketing campaign, other water conservation programs also target outdoor water use and, in particular, residential irrigation practices in order to reduce peak use. The City also promotes sensible indoor conservation practices, such as shorter showers, turning off the water while brushing teeth, and finding and fixing toilet leaks. The City brings these conservation messages to public events,

including I Heart Rockwood, SW Neighborhood Association Information Fair, Gresham Arts Festival, Mt. Hood Community College Conservation Fair, CityFest, Play-Grow-Learn event, Rock the Block, Portland Home and Garden Show.

The City has brochures, activity books, and materials that are made available at these community events, the billing office, reception areas, and in some cases, the City's website. In addition, the City provides water saving devices at these locations, as described below.

Five-Year Benchmarks:

- Continue the City's public education programming over the next 5 years.
- Continue membership in the RWPC and participate in the public education programming available through the RWPC.

3.4.4 City Additional Conservation Measures

OAR 690-086-0150(5)

1. Technical and Financial Assistance

The City provides customer assistance based on individual customer requests. For example, when a customer concerned about the cost of their water bill contacts the City, City staff reviews the water use history and the water rates with the customer and offers ideas on how the customer could minimize water use, help the environment, and reduce their water bills.

As a way to assist the City's commercial and industrials customers, the City supports the Green Businesses Program. The program was initiated in approximately 2000 through collaboration between the City's Water Division and the City's Recycling and Solid Waste Program, funded through a Metro grant. Since inception, the program has helped scores of businesses reduce water use. This popular program provides free assistance, resources, and recognition to help businesses conserve natural resources, protect the local environment, and help their own bottom line. To support this program, the City provides funds for staffing and efficient water devices for staff to disseminate. As one component of this program, City staff works with businesses to analyze water usage and then the City provides water conservation recommendations. The City had provided an average of 14 business visits per year in the 2010s prior to the pandemic, however pandemic responses curtailed the program. After resumption of the visits, five were conducted in FY 2021/22.

Higher level technical assistance may be provided to commercial and industrial customers by contract with the PWB's Business, Industry, and Government Program, such as technical assistance related to industrial controls and cooling systems.

In addition to these means of assistance, the City's Water Division operations staff provide technical assistance to customers with water bills that are unexpectedly high or low. Assistance comes in the form of a phone call or visit in an attempt to identify the reason for an unusual bill amount. If the meter appears to be in working condition, staff will talk with customers about ways to identify water leaks.

The City's website provides water conservation tips, such as running a full load of dishes or laundry for indoor savings and using a broom instead of water from a hose to clean pavement. The website of the RWPC (to which the City has a link on the City's website) includes a wide array of technical information for customers. For example, RWPC's website shows how to conduct a mini in-home water audit and provides a "weekly watering number" based on local evapo-transpiration rates to help customers avoid over-irrigating plants. In addition, the City's website advertises that it offers free toilet leak detection dye tabs and instructions. These dye tabs help customers identify toilet leaks and the instructions describe ways for customers to repair these leaks. These tabs are offered at the UB counter at City Hall.

Five-Year Benchmarks:

- Continue supporting the Green Businesses Program.
- Continue offering customers ways to conserve during visits to the customers' homes or places of business during meter checks and when customers visit the UB counter.
- Continue to maintain and periodically freshen information on the City's website that provides technical assistance to customers on the topic of water conservation and continue to link to the RWPC's website for additional resources for customers.
- Continue to offer instructions for customers to test for toilet leaks.

2. Retrofit/Replacement of Inefficient Fixtures

The City promotes retrofitting or replacing inefficient fixtures through its conservation program. Since the early 2010s, the City has offered a WaterSense Toilet Rebate program to single family residents. A homeowner can apply for up to two $50 cash rebates for installing WaterSense certified high efficiency toilets (1.28 gallons per flush). During the City's first year of the program (FY 2010–2011), the City provided 10 rebates. The City expanded the program in FY 2016/17 to include multifamily customers, offering up to 10 rebates per customer. Since program inception, the City has provided 548 rebates.

The City provides indoor water conservation kits to its customers. The indoor kits currently include water efficient showerhead, faucet aerator, swivel aerator, and pipe tape. These items can reduce water by controlling the flow of water during common activities, which can add up to meaningful water savings over time. These devices are distributed to residential customers upon request (the City advertises the availability of the kits on its website) and at events attended by the City. Through membership in the RWPC, the City's customers may also obtain similar kits annually during a one-time event. In addition, the City provides similar devices to customers who participate in the GREEN businesses program. Further, the City has partnered in the past with Energy Trust of Oregon to provide free home water and energy assessments to the City's single-family residents, however these assessments are no longer offered.

Five-Year Benchmarks:

- Continue advertising and offering rebates for WaterSense toilets.

- Continue advertising and providing indoor conservation kits to customers.
- Consider offering outdoor conservation kits to customers.

3. Water Rate Structure and Billing Schedule

The City currently bills customers on a bi-monthly basis, as previously described. In addition, the City has a tiered consumption charge for some customer categories. The City will evaluate the potential for monthly billing, which is a more viable option following the installation of meters fitted with technology that allows staff to have instantaneous access to meter reads. A monthly billing schedule helps customers better understand and manage their water use by providing customers with more rapid feedback on the costs of their recent water use.

Five-Year Benchmark:

- Over the next 5 years, evaluate billing customers on a monthly basis.

4. Reuse, Recycling, and Non-potable Water Opportunities

In the 2010s, the City conducted a water reuse evaluation for the Springwater area, a large, low-density area previously annexed into the City. The report for this evaluation recommended that the City consider requiring installation of a dual distribution (purple pipe) system as part of the land development process to serve landscape irrigation needs in Springwater as the area develops. The system would initially be supplied from converted agricultural wells, which would provide non-potable water to the area for irrigation use. In the future, the system could also be supplied by industrial reuse if the characteristics of wastewater discharged by the industrial facilities are similar to those of the wastewater currently discharged by Microchip Technology (a Class A reuse system supplied by reuse water produced at the Gresham wastewater treatment plant), or by a scalping wastewater treatment plant located in Springwater. (A scalping wastewater treatment plant pulls off the liquid phase of waste flows from the solids present, allowing for easier treatment techniques than full biological control.)

The initial steps for developing a purple pipe system would include inspecting and test-pumping existing agricultural wells, requiring the installation of a dual distribution pipe system as part of the land development process, and working with industries locating in the Springwater area to include appropriate treatment in facility planning. The City discussed the report and concluded that implementation of the recommendations was very unlikely in the near term due to the prohibitively high capital costs of a dual distribution system.

The City offers graywater reuse information from DEQ to customers, as well as a brochure on rain barrels from the RWPC.

The City has a well and water rights for irrigation at Gradin Sports Park. However, The City decided development of the well was cost-prohibitive compared to using the existing public distribution system.

Five-Year Benchmarks:

- Within the next 5 years, continue to evaluate non-potable water opportunities.
- Continue promoting greywater systems.

5. Other Conservation Measures

The City has a City code that prohibits wasteful or negligent use of water (Gresham Revised Code [GRC] 5.45.040), under which the City may discontinue water service if the customer does not correct conditions within five days after receiving written notice from the City.

4. Curtailment Plan

This section satisfies the requirements of OAR 690-086-0160.

This rule requires a description of past supply deficiencies and current capacity limitation. It also requires inclusion of stages of alert and the associated triggers and curtailment actions for each stage.

4.1 Introduction

Curtailment planning is the development of proactive measures to reduce demand during supply shortages resulting from any number of events, such as prolonged drought, system failure from unanticipated events including catastrophic events (flooding, landslides, earthquakes, and contamination), mechanical or electrical equipment failure, localized or area-wide power outages and intentional malevolent acts.

In Sections 4.2 and 4.3 below, the providers present their curtailment plans to meet their individual needs to address a water supply shortage. The providers will follow these plans until they begin relying solely on the Cascade groundwater system in 2026. Following the transition to this system, the providers will utilize a joint curtailment plan, which is presented in Section 4.4.

The goal of these curtailment plans is to have objective criteria that trigger actions that will ensure sufficient water to meet the water demands of the water supply system, without jeopardizing the health, safety, or welfare of the community. The actions in these curtailment plans are intended to provide the greatest assurance of maintaining potable supplies for human consumption.

Sections 14 of the IGAs between the District and City with PWB for wholesale water supply requires the District and City to maintain curtailment plans and implement curtailment measures sufficient to meet the requirements of the PWB's curtailment plan. As a result, the following individual-provider curtailment plans are complementary to the PWB curtailment requirements. In addition, PWB prepares a seasonal water supply augmentation and contingency plan annually. The plan is developed by PWB staff with input from wholesale customer representatives. It provides a strategy for managing PWB's water supplies, if needed, during the peak demand season to meet key objectives, including water supply reliability, high water quality, water use efficiency, fish recovery, and cost management.

4.2 Rockwood Water People's Utility District

4.2.1 History of System Curtailment Episodes

OAR 690-086-0160(1)

The District's current base water supply is provided by PWB and all water demand beyond the base flow from PWB is supplied by the District's groundwater supply. To date, these two sources

have been adequate to meet the District's full demands. The last curtailment occurred in 1992 during the severe, summer-long drought in the Portland metro area when the City of Portland's backup water supply was unavailable. Since then, the District has not had to implement curtailment stages or measures.

The District's current capacity to use its groundwater supply is limited by the capacity of the Cascade groundwater system's three wells, one of which (Cascade 5) is jointly operated with the City. These wells are only used to meet demand that exceeds the District's base volume of water of 6.94 mgd that Rockwood is required to purchase per its IGA with PWB. In the event that Rockwood would not be able to obtain water from these wells, PWB would likely be able to supply any additional volumes of water that the District would require.

4.2.2 Curtailment Stages and Event Triggers

OAR 690-086-0160(2) and OAR 690-086-0160(3)

The District's Curtailment Plan, presented in Exhibit 4-1, has three stages that increase in the level of severity. The stages of alert for the District's water curtailment plan are based on the percentage of available supply consumed on a daily basis during a water shortage event. PWB curtailment activities could also potentially trigger curtailment by the District. The curtailment stages and triggers for each stage of alert for the District are described in greater detail below.

Exhibit 4-1. Curtailment Stages 1 through 3

Curtailment Stages	Initiating Conditions
Stage 1 Moderate Water Supply Alert	Water consumption reaches 90 percent of available supply capacity for three consecutive days PWB triggers water curtailment activities requesting customers to conserve water
Stage 2 Critical Water Supply Alert	Water consumption reaches 95 percent of available supply capacity for three consecutive days PWB triggers water conservation activities requiring mandatory reduction in water use
Stage 3 Emergency Water Shortage	Water consumption reaches 100 percent of available supply capacity for one day PWB declares an emergency condition

4.2.3 Authority

The District Manager has the authority to initiate and terminate water curtailment stages.

4.2.4 Curtailment Plan Implementation

OAR 690-086-0160(4)

Upon implementation of each stage of the District's curtailment plan, the District will implement associated curtailment measures. Each stage's measures are more stringent than the previous stage's measures, reflecting the increasing severity of the impact of the water shortage on supplies. The ultimate goal of these measures is to reduce water demand such that the District can meet demand and the District can rescind its call for curtailment or, at a minimum, rely on less stringent measures. None of the measures presented below are intended to jeopardize the health and safety of the District's customers.

1. Stage 1: Moderate Water Supply Alert

Stage 1 is activated when water consumption reaches 90 percent of available supply capacity for three consecutive days or when PWB triggers water curtailment activities. Under the first stage of alert, the District will promote voluntary water use reductions to its customers through the District's website and through the media (i.e., newspapers and radio). These voluntary water reductions requested will include:

- Postpone new plantings
- Restrict or eliminate use of water to clean paved surfaces, such as driveways, sidewalks, and patios
- Check for leaks in plumbing or irrigation systems, and repair them if found
- Reduce indoor water use, such as reducing shower times and use of washing machines
- Follow voluntary irrigation schedules to minimize water usage peaking, such as:
    - Outdoor watering limited to the early morning or late evening

The District will also limit unnecessary use of water including line flushing and hydrant testing. If water curtailment action is required by PWB, the District will take the additional required actions.

2. Stage 2: Critical Water Supply Alert

Stage 2 is activated when water consumption reaches 95 percent of available supply capacity for three consecutive days or when PWB triggers mandatory water curtailment activities. Under the second stage of alert, the District will continue to promote voluntary water use reductions (similar to Stage 1) and will implement some mandatory water use reduction requirements. The District will inform its customers of mandatory use reduction requirements through its website and the media, such as newspapers and radio. Mandatory water use reduction requirements will include:

- No washing of vehicles except for health and safety reasons
- No using water to wash or wet down sidewalks, walkways, driveways, parking lots, or

other hard-surfaced areas

- No pressure washing roofs, decks, or building siding unless the action was contracted for before implementation of this curtailment stage
- No installation of new turf or plantings
- No filling swimming, wading, or other pools
- No filling or maintaining decorative streams, ponds, or fountains unless it has a recirculating water system or contains fish.
- Mandatory irrigation schedules, such as:
    - Outdoor watering limited to the early morning or late evening

Voluntary water use reduction by businesses, which could include:

- Reducing water used for manufacturing, etc.
- Restricting all non-essential water use

The District will also cease line flushing and hydrant flushing activities. If water curtailment action is required by PWB, the District will take the additional required actions.

3. Stage 3: Emergency Water Shortage

Stage 3 is activated when water consumption reaches 100 percent of available supply capacity for one day or when PWB declares emergency water curtailment activities. Upon Stage 3 activation, the District will notify (as appropriate) staff, the City, Multnomah County, Oregon Drinking Water Program, Oregon Department of Human Services, law enforcement, and customers with critical needs (e.g., medical facilities) of curtailment measures going into place. Under the third stage of alert, the District will continue with measures implemented during Stage 1 and Stage 2 alerts and implement further mandatory requirements. The District will inform its customers of mandatory use reduction requirements through such means as its website, the media (i.e., newspapers and radio), phone calls, and door to door. Additional water curtailment requirements will include:

- Prohibition of all outdoor water use
- Prohibition of all non-essential residential water use; all uses other than basic sanitation, drinking, and culinary use are prohibited
- Mandatory curtailment benchmarks for water use deemed critical by businesses and large volume water users; prohibition of all non-essential commercial and industrial water use, except for human health and safety

The District will also impose a temporary moratorium on new water delivery connections and temporary water delivery, such as for construction projects. If emergency conditions are declared by PWB, the District will implement the required additional water curtailment actions.

4.3 City of Gresham

4.3.1 History of System Curtailment Episodes

OAR 690-086-0160(1)

The City's base water supply is also provided by PWB. In addition, the City developed a groundwater supply system in cooperation with the District that provides the remainder of the City's water supply. Over the past 10 years, these sources have been adequate to supply the City's full demand. Consequently, the City has not had to implement curtailment stages or measures during this time. In addition, given the multiples sources of supply available to the City, either primary or secondary/emergency, the City does not have capacity limitations that may cause a water shortage.

The City currently has enough capacity to obtain sufficient water from the Bull Run watershed and the shared groundwater system to meet its current demands.

4.3.2 Curtailment Stages and Event Triggers

OAR 690-086-0160(2) and OAR 690-086-0160(3)

Similar to the District, the City's current wholesale water agreement with PWB requires the City to implement curtailment measures sufficient to meet the requirements of the PWB's curtailment plan. As a result, the City's Curtailment Plan is complementary to the PWB curtailment requirements. As previously described, PWB also prepares a seasonal water supply augmentation and contingency plan annually.

The City's Curtailment Plan has four stages that increase in the level of severity. The stages of alert for the City's water curtailment plan will largely be based upon operational capacity and its percentage below anticipated demand. The curtailment stages and triggers for each stage of alert for the City are described in greater detail in Exhibit 4-2.

Exhibit 4-2. Curtailment Stages 1 through 4

Curtailment Stages	Initiating Conditions
Stage 1 Mild Water Supply Alert – Voluntary Curtailment Goal: • Reduce demand by at least 5 percent • Meet operational capacity	• Operational capacity is less than 95 percent of anticipated demand • PWB initiates Stage 1 curtailment • Manager's discretion
Stage 2 Moderate Water Supply Alert – Partial Mandatory Curtailment Goal: • Reduce demand by at least 10 percent • Meet operational capacity	• Operational capacity is less than 90 percent of anticipated demand • Manager's discretion

Curtailment Stages	Initiating Conditions
Stage 3 Severe Water Supply Alert – Mandatory Curtailment Goal: • Reduce demand by at least 20 percent • Meet operational capacity • Use water for health, safety, and critical economic activity only	• Operational capacity is less than 80 percent of anticipated demand • District or PWB sources may become unavailable in the near future or are temporarily unavailable • Manager's discretion
Stage 4 Emergency Water Shortage Goal: • Meet basic human health and safety needs • Prioritize use of the remaining supply of stored water	• Operational capacity is less than 70 percent of anticipated demand • District or PWB sources are unavailable for an undetermined length of time • Manager's discretion

4.3.3 Authority

In the City's municipal code, the City Council has the authority to apportion among customers a restricted supply of water (GRC 5.70.010). The City Council has the authority to enact curtailment stages, but if prompt action is needed to protect the public, the City Manager has the authority to activate each curtailment stage (GRC 5.70.020). In addition, City Council may adopt rules, procedures, and forms to restrict water use and has the authority to enforce water curtailment measures and enact penalties (GRC 5.70.020 and 5.70.030). The City Council may terminate adopted curtailment rules when it finds that the water shortage no longer exists, and the remaining water supply exceeds anticipated demand (GRC 5.70.040).

4.3.4 Curtailment Plan Implementation

OAR 690-086-0160(4)

1. Stage 1: Mild Water Supply Alert – Voluntary Curtailment

Stage 1 is activated when operational capacity is less than 95 percent of anticipated demand and/or PWB initiates Stage 1 curtailment of its water system. Activation of Stage 1 is at the discretion of the City Manager. The goals of Stage 1 are to reduce demand by at least 5 percent and to meet operational capacity. Under Stage 1, the City may take the following actions to curtail City and customer water use:

Internal Actions

- Notify City officials of Stage 1 status
- Reference to curtailment actions implemented and required by PWB
- Coordinate with PWB and the District
- Notify regional water providers

- Notify Emergency Management
- Conservation in municipal parks through reduction of water used for irrigation or other uses, which could include turning off public drinking fountains and toilets and reducing or ceasing irrigation
- Hydrant and water line flushing allowed on a case-by-case basis
- Form water supply shortage team to prepare for further measures
- Turn off non-recirculating fountains

Public Outreach

- Conduct conservation outreach using press releases, the website, and social media
- Request moderation of outdoor watering

2. Stage 2: Moderate Water Supply Alert – Partial Mandatory Curtailment

Stage 2 is activated when operational capacity is less than 90 percent of anticipated demand. Activation of Stage 2 is at the discretion of the City Manager. The goals of Stage 2 are to reduce demand by at least 10 percent and to meet operational capacity. In addition to Stage 1 actions, the City may take the following actions to curtail City and public water use in Stage 2:

Internal Actions

- Notify City officials of Stage 2 status
- Reference to any additional curtailment actions implemented and required by PWB
- Notify regional water providers; discuss sharing resources, such as water and infrastructure repair equipment and staff
- Notify Emergency Management
- Coordinate with other City departments (i.e., Parks, Transportation, Fire) to prioritize and limit discretionary uses
- Consider curtailment enforcement, in accordance with GRC 5.70.030

Public Outreach

- Expand conservation outreach, the use of advertising, and other forms of media
- Announce voluntary or mandatory curtailment of outdoor watering.
- Request that customers voluntarily limit non-essential water uses, which could include:
    - filling pools or hot tubs
    - washing cars

- using power-washers
- water intensive commercial activities that don't compromise core business performance.

3. Stage 3: Severe Water Supply Alert – Mandatory Curtailment

Stage 3 is activated when operational capacity is less than 80 percent of anticipated demand and/or PWB or District water sources become unavailable. Activation of Stage 3 is at the discretion of the City Manager. The goals of Stage 3 are to reduce demand by at least 20 percent, to meet operational capacity, and to only use water for health, safety, and critical economic activities. In addition to Stage 2 actions, the City may take the following actions to curtail City and public water use in Stage 3:

Internal Actions

- Notify City officials of Stage 3 status
- Reference to actions implemented and required by PWB
- Contact State Drinking Water Program, county, state, and federal officials, as appropriate
- Notify Emergency Management
- Activate the emergency broadcast system
- Expand water curtailment by the Parks Department to include ceasing water uses not curtailed in earlier stages
- Prohibit non-essential City water use
- Consider implementing enforcement of city codes for water curtailment by sending out fines and establishing a hotline to report violators
- Prohibit new connection or main extension work except those approved by the Water Division Manager
- Connect to other water sources as available and as necessary
- Mobilize and prepare for a system shutdown and rationing protocol

Public Outreach

- Expand conservation messaging to public and wholesale customers and include phone calls and door to door visits in outreach efforts
- Announce that non-essential water use is prohibited except for maintenance of critical commercial activity and for public health and safety.

4. Stage 4: Emergency Water Shortage

Stage 4 is activated when operational capacity is less than 70 percent of anticipated demand and/or PWB or District water sources become unavailable. Activation of Stage 4 is at the discretion of the City manager. Stage 4 is considered an emergency scenario, such that the goals of Stage 4 are to meet basic health and safety needs and to prioritize use of remaining stored water supplies. In addition to Stage 3 actions, the City may take the following actions to curtail City and public water use in Stage 4:

Internal Actions

- Notify City officials of Stage 4 status
- City Manager may update or adopt interim curtailment rules upon finding that failure to act promptly will result in serious prejudice to the public interest GRC 5.70.020(2)(b)
- Reference to actions implemented and required by PWB
- Deploy portable water distribution systems
- Isolate damaged parts of the water system, as needed, and other operational needs to maintain maximum performance of the water system
- Contact State Drinking Water Program, county, state, and federal officials, as appropriate
- Notify Emergency Management
- Activate Emergency Broadcast System, consider activating the Emergency Operations Center

Public Outreach

- Further expand conservation outreach, and expand the use of media, phone calls, and door to door visits
- Announce prohibition of all non-essential water use, except water uses necessary for public health or safety
- Announce prohibition of water use by large industrial and institutional accounts except for fire protection and other critical functions
- Contact customers with critical needs, such as medical facilities, to discuss any basic health and safety needs
- Contact large volume customers, which are defined as the top 50 percent of general service water users, to discuss any basic health and safety needs

4.4 Joint Curtailment Plan

The following joint curtailment plan will be used when the District and City begin relying on the Cascade groundwater system as their primary source of supply.

4.4.1 Joint Curtailment Stages and Event Triggers

OAR 690-086-0160(2) and OAR 690-086-0160(3)

The joint Curtailment Plan has four stages of alert, with each successive stage representing an increase in the level of severity of the water supply shortage. Each of these four stages have initiating conditions, or triggers, which define when these stages are implemented. The stages of alert for the water curtailment plan will largely be based upon firm capacity of the Cascade groundwater system relative to anticipated demand. The capacity is based on the combined yield of all wells normally in service, without the largest well.

The District and City will reference the following initiating conditions during a water shortage to determine an appropriate stage of curtailment. The District and City will consider the specific circumstances of the actual event and rely on the knowledge and judgment of staff members familiar with the water system to determine when each curtailment stage should be implemented. Staff members may evaluate the extent of system damage or contamination, duration of repair, costs, fire hazards, storage volumes, weather forecasts, and the availability of emergency water supplies from neighboring water providers, among other criteria, to make this determination.

The District and City response to a water shortage may escalate successively through each stage. Alternatively, a later stage could be implemented directly, bypassing earlier stages (e.g., moving from stages 2 to 4), depending upon the event at hand. The curtailment stages and triggers for each stage of alert for the District and City are described in greater detail in Exhibit 4-3.

Exhibit 4-3. Joint Curtailment Stages 1 through 4

Curtailment Stages	Initiating Conditions
Stage 1: Mild Water Supply Alert – Voluntary Curtailment	• Demand is anticipated to be 90% to 100% of system firm capacity for more than one day
Stage 2: Moderate Water Supply Alert – Partial Mandatory Curtailment	• Demand is anticipated to exceed system firm capacity, but to be less than total system capacity, for up to three days
Stage 3: Severe Water Supply Alert – Mandatory Curtailment	• Demand is anticipated to exceed total system capacity for more than three days
Stage 4: Emergency Water Shortage -- Mandatory Curtailment	• Near or complete loss of system capacity

4.4.2 Authority

See Sections 4.2.3 and 4.3.3 for the providers respective authorities to carry out this joint curtailment plan.

4.4.3 Curtailment Communication

Communication of a water shortage and the associated curtailment actions is critical to ensure timely and effective response by water users and wholesale customers. The District and City will communicate specific actions users can take to reduce usage and may include a summary of the current water situation, the reasons for the requested reductions, and a warning that additional cutbacks may be required if voluntary or mandatory measures do not sufficiently reduce water usage. The District and City will include its customers, including wholesale customers, in outreach efforts. Existing conservation outreach will be expanded while the curtailment plan is in use. The following list identifies outreach methods that the District and City may use to communicate curtailment stages and actions to its customers, starting with actions that can be quickly implemented.

- Postings on websites
- Social media alerts
- Press releases
- Newspapers and radio announcements
- Phone calls
- Water curtailment letters sent to customers
- Door-to-door visits (e.g. distribution of door hangers)
- Contacting local media outlets and request they notify the public about the potential for water shortages or temporary interruptions to normal service delivery
- Providing notice on water bills and through utility bill inserts
- Advertisements on local television and radio stations and in newspapers
- Messaging on PublicAlert through the Drinking Water Advisory Tool available for customers on our website and pushed to their registered phone numbers.

In addition, the District and City may elect to directly contact local emergency management teams, county, State, Federal officials, staff, Oregon Drinking Water Program, Oregon Department of Human Services, law enforcement, and customers with critical needs (i.e., medical facilities) about the water shortage and providers' collective response, as needed.

4.4.4 Curtailment Plan Implementation

OAR 690-086-0160(4)

This plan includes both voluntary and mandatory curtailment measures associated with each of the four stages of alert. These measures are intended to reduce demand during water shortages, thereby extending the District's and City's water supply to meet the basic health and safety

needs of the community at a minimum. The measures associated with each stage of alert are described below.

For each stage, a joint operations team comprised of representatives from the District and City will prepare for and coordinate implementation of this curtailment plan. This operations team will notify District and City officials, regional water providers, and the providers' Emergency Management teams about the water shortage at each stage as needed. Based on the severity of the water supply alert, the District and City may notify additional contacts, such as the Oregon Drinking Water Program.

At any stage, additional restrictions may be imposed beyond those described herein if they are deemed necessary or restrictions can be removed or modified as needed. None of the curtailment measures are intended to jeopardize the health and safety of the District's customers.

1. Stage 1: Mild Water Supply Alert – Voluntary Curtailment

All Stage 1 curtailment measures are voluntary and are listed below.

District and City Measures

Implement conservation measures beyond those existing measures currently implemented at District and City facilities, which could include:

- Reduce or cease irrigation at parks and other City or District owned landscaped areas"
- Allow hydrant and water line flushing on a case-by-case basis
- Turn off non-recirculating fountains
- Coordinate with other City departments to prioritize and limit discretionary uses

Customer Measures

- Check for leaks in plumbing or irrigation systems, and repair them if found
- Reduce indoor water use, such as reducing shower times and running full loads of laundry (washing machines) and dishes (dish washer)
- Eliminate the filling pools or hot tubs
- Eliminate the filling or maintaining decorative streams, ponds, or fountains unless it has a recirculating water system or contains fish
- Wash vehicles only for health and safety reasons
- Eliminate using water to wash or wet down sidewalks, walkways, driveways, parking lots, or other hard-surfaced areas
- Postpone installation of new turf or plantings
- Reduce water-intensive business activities that don't compromise core business performance
- Irrigate only between the late evening and early morning (between 8 pm and 6 am)

2. Stage 2: Moderate Water Supply Alert – Mandatory Curtailment

Under the second stage of alert, the District and City will implement all Stage 1 measures, which will be mandatory. The District and City will notify water suppliers with interconnections to the Cascade groundwater system and discuss the potential need to obtain emergency supplies.

3. Stage 3: Severe Water Supply Alert – Mandatory Curtailment

Under the third stage of alert, the District and City will continue implementing Stage 2 mandatory measures and implement further mandatory requirements as shown below.

District and City Measures

- Contact customers with critical needs, such as medical facilities, to discuss any basic health and safety needs
- Contact large volume customers, which are defined as the top 5 percent of general service water users, to discuss any basic health and safety needs
- Expand water curtailment by the Parks Department to include ceasing water uses not curtailed in earlier stages
- Cease line flushing and hydrant flushing activities except to maintain public health and safety
- Prohibit new connections or main extension work except projects approved by the City/District and connections for temporary water delivery, such as construction projects
- Consider apportioning the City's or District's available supply by customer type (e.g. x gallons per residential customer per day) based on historical consumption volumes
- Consider implementing enforcement of City codes for water curtailment by sending out fines and establishing a hotline to report violators
- Prepare for potential system shutdown

Customer Measures

- Establish mandatory curtailment benchmarks for water use deemed critical by businesses and large volume water users
- Reduce all non-essential water uses

4. Stage 4: Emergency Water Shortage

Under the fourth stage of alert, the District and City will activate the Emergency Broadcast System and consider activating the Emergency Operations Center. All Stage 3 measures continue to be implemented, in addition to the following measures.

District and City Measures

- Deploy portable water distribution systems
- Isolate damaged parts of the water system and other operational needs to maintain maximum performance of the water system

Customer Measures

- Prohibit all non-essential water use, except water uses necessary for public health or safety
- Businesses, large volume water users, and industrial and commercial accounts prohibited from using water except for fire protection and other critical human health and safety functions.

4.5 Drought Declaration

If a declaration of a severe drought in Multnomah County is declared by the Governor per ORS 536.720, the Oregon Water Resources Commission may order political subdivisions within any drainage basin or subbasin to implement a water conservation or curtailment plan or both, approved under ORS 536.780. The conservation and curtailment elements of this WMCP meet these requirements. If the City falls within a severe drought area declared by the Governor, such as Multnomah County, the City will consider whether curtailment measures are needed to meet system demands. If ordered to implement a water conservation or curtailment plan during a declared drought, the City will comply by implementing the water conservation and curtailment provisions of this WMCP. Regardless of whether curtailment is needed, the City will continue to encourage customers to conserve water.

5. Water Supply

This section satisfies the requirements of OAR 690-086-0170.

This rule requires descriptions of the District's and City's current and future water delivery areas and population projections, demand projections for 10 and 20 years, and the schedule for when the District and City expect to fully exercise their municipal water rights. The rule also requires comparison of the District's and City's projected water needs and the available sources of supply, an analysis of alternative sources of water, and a description of required mitigation actions.

5.1 Delineation of Service Areas

OAR 690-086-0170(1)

5.1.1 Rockwood Water People's Utility District

The District's current water service area boundary is not expected to change over the planning period from the existing boundaries. New customers and the resulting increased future water demands are expected primarily as a result of expanded industrial and commercial development, as well as infill and redevelopment within the existing service area. The District's water service area is illustrated in Exhibit 2-2.

5.1.2 City of Gresham

The City's future water service area includes the existing water service area and two large rural, under-developed areas, the Pleasant Valley and Springwater Plan Districts located at the southwestern and southeastern corners of the City's service area, respectively. The City expects significant development to occur in these areas over the planning period. The City's current and future water service areas are illustrated in Exhibit 2-18. The following population and demand forecasts account for these areas in addition to the rest of the service area of the City.

5.2 Population and Demand Projections

OAR 690-086-0170(1)

5.2.1 Rockwood Water People's Utility District

A service area population forecast was performed by Portland State University's Population Research Center in 2019 and serves as the basis for the demand forecast. The results of this forecast are presented in Exhibit 5-1. As shown, the District's service area population is projected to reach 71,801 by 2042.

The population forecast results were used to project the District's future demands. The District's projected ADDs for 2032 and 2042 were calculated using the sum of individual future demands for the residential and non-residential classes; Microchip, the District's largest customer; and

estimates of future water losses. Residential consumption was calculated by multiplying a per capita water use factor to projected populations in 2032 and 2042. A residential water use factor of 60 gallons per capita per day (gpcd) was used. The water use factor was based on annual historical consumption volumes and an estimate of current population. To convert ADD to MDD, a peaking factor of 1.9 was applied to future consumption volumes for the residential sector. This peaking factor was estimated based on historical (2016–2019) real time daily residential consumption data provided by the City since the City's residential customers are very similar in water use profile to Rockwood customers.

Non-residential demand was forecasted by applying an annual growth rate of 0.5 percent to current annual aggregated consumption volumes for non-residential customers. Non-residential customers include customers in the commercial and industrial, non-profit, and public, and fire meter classes. The growth rate of 0.5 percent was based on the 2010–2019 average growth rate of non-residential meters reported by the District. A peaking factor of 1.5 was assumed for MDD consumption calculations. This non-residential peaking factor was calculated using a similar method as the method described previously for the District's residential demand forecast.

The District's largest user is Microchip, a microprocessor chip manufacturing facility. Future demand for this user was calculated separately from the District's other non-residential users. Based on information provided by Microchip, the District increased consumption to 2.25 mgd over the planning period from its current consumption of 1.5 mgd and assumed no seasonal increases to consumption that would impact peak day demand.

Demand projections for 2032 and 2042 were developed by adding the projected consumption from residential and non-residential customers and Microchip[8]. Water loss was added to consumption of these customers because consumption volumes do not factor in water loss in the distribution system. A value of 10 percent was selected in anticipation of the District reducing their current loss percentage through the conservation measures discussed in this WMCP. The results of these demand calculations are provided in Exhibit 5-1. ADD is expected to increase from 6.5 mgd (rounded 5-year historical average) to 8.2 mgd by 2042 and MDD is projected to increase from 9.7 mgd (rounded 5-year historical average) to 12.9 mgd by 2042.

Exhibit 5-1. Rockwood Water People's Utility District Population and Demand Projections

Year	Population	ADD (mgd)	MDD (mgd)
2032	69,949	8.0	12.6
2042	71,801	8.2	12.9

[8] "Non-residential customers" did not include Microchip.

5.2.2 City of Gresham

OAR 690-086-0170(1) and (3)

A forecast of the City's future service area population was performed by the City during development of its 2022 Water System Master Plan (WSMP).[9] This population projection was the basis for the City's demand forecast. Appendix D includes an excerpt from the WSMP, which describes the City's calculations of future population and demand. In summary, the City's population forecast was calculated based on short and long-term growth projections (rates of growth). These rates were based on a review of multiple data sources, including projections and growth rates for the service area and historical growth rates for the City and county. Based on this information, the City settled on the use of an average growth rate of 0.52 percent for the short term, the period from 2021 to 2024. This rate was equivalent to the average annual historical population rate of growth that the City observed from 2010 to 2020. For the long-term projections, a high rate of annual growth of 1.16 percent was assumed beginning in 2025, followed by a gradual decrease through 2050. The slowing of the long-term rate of growth mirrored the trajectory of population projections for the City's service area described in a study conducted for the City by Portland State University's Population Research Center previous to development of the City's WSMP. As shown in Exhibit 5-2, the City's service area population is projected to be 88,988 in 2032 and reach 95,959 in 2042. These population projections were used to forecast demand.

Demand forecasts were performed to project the City's estimated ADD and MDD for 2032 and 2042. The City's demand projections are comprised of the sum of residential demand projections and non-residential projections. Residential demands represent demands for both single family and multifamily residences. Future residential demand was projected by applying a water use factor of 60 gpcd to the population projections. This water use factor was calculated by dividing current population by historical consumption data (2016 to 2019) to arrive at 59 gpcd which was rounded to 60 gpcd for the forecast.

Non-residential demands were calculated by applying a growth factor to recent historical consumption volumes for each of the non-residential customer classes. The growth of the Commercial and Public Services classes is expected to equal the growth rate applied to the City's Residential customers, resulting in slow growth through 2025, followed by a higher rate of growth that tapers over time. Growth in consumption of the City's Industrial customers will be moderate through 2025 according to the City's WSMP, then decrease immediately thereafter, and slowly increases through the planning period.

To account for water losses, the City added 5 percent to consumption volumes. This percentage was calculated based on historical water losses from 2016 to 2019, which ranged from 3 to 6 percent.

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[9] Murraysmith. March 2022. *City of Gresham Water System Master Plan*. https://greshamoregon.gov/WorkArea/DownloadAsset.aspx?id=14717

The sum of projected residential and non-residential demands plus water loss provided projections of ADD. ADD was converted to MDD using a peaking factor of 1.7 based on a review of historical peaking factors that ranged from 1.57 to 1.77 and averaged 1.65 from 2011 to 2019.

Exhibit 5-2. City of Gresham Population and Demand Projections

Year	Population	ADD (mgd)	MDD (mgd)
2032	88,988	6.8	11.5
2042	95,959	7.8	13.2

5.2.3 Combined Demand Projections

The demand projections for the Cascade groundwater system equals the individual demand projections of the District and City as presented in the previous sections. The combined MDD is projected to reach 26.1 mgd (12.9 + 13.2 mgd) or 40.4 cfs by 2042 as shown in Exhibit 5-3. Following the transition from the use of wholesale water from PWB in 2026, the District and City will rely solely on the Cascade groundwater system and associated water rights to meet this 20-year demand.

Exhibit 5-3. Demand Projections for the Cascade Groundwater System

Year	Population	ADD (mgd)	MDD (mgd)
2032	158,937	14.8	24.1
2042	167,760	16.0	26.1

5.3 Schedule to Exercise Permits and Comparison of Projected Need to Available Sources

OAR 690-086-0170(2) and (4)

To meet future demands, the District and City will continue to rely on Certificate 83629 and Permit G-16917. Certificate 83629 is held by the District and authorizes appropriations of up to 10 cfs of groundwater, further limited to up to 5.34 cfs from Cascade Well 3 and up to 8.97 cfs from Cascade Well 4. The District and City jointly hold Permit G-16917, which authorizes appropriations of up to 53.5 cfs of groundwater from nine wells. Of these nine wells, Cascade Wells 3 through 5 have been constructed and are in use. The amount of groundwater currently available under these water rights is limited by the capacity of these three wells. Three additional wells have been drilled and are anticipated to be online in 2023, and two more will be drilled in 2023 and online in 2024.

When the District and City begin relying on the Cascade groundwater system in 2026, additional wells and associated infrastructure will have been constructed with additional plans to continue

expanding the system, including new wells, to meet long term demands of the providers. The addition of these new wells will increase the providers' ability to appropriate groundwater under Permit G-16917 at a rate necessary to meet this future demand. The District and City intend to meet their projected 2042 MDD of 40.4 cfs using 10 cfs of water available under Certificate 83629 with the remainder of this MDD (30.4 cfs) being met using Permit G-16917. This sequencing allows the District and City to use the certificate—a more secure water right—prior to relying on the permit to meet demands.

In order to meet the 2042 projected demand of 40.4 cfs and in consideration of the sequencing of water right use by the District and City, the District and City would need to appropriate 30.4 cfs (40.4 cfs - 10 cfs) under Permit G-16917. The District and City have access to 4.42 cfs under the permit. Therefore, the District and City request access to 26 cfs under Permit G-16917 (30.4 cfs - 4.42 cfs = 26 cfs, rounded).

Forecasts of demand beyond 2045 were not conducted for Gresham's WSMP and have not been conducted for Rockwood's WSMP, which is currently under development. For this WMCP, the District and City extrapolated demand projections shown in Section 5.2 through 2080 to arrive at a combined District and City MDD of 47.4 cfs. While this rate is less than the combined rate authorized by Certificate 83629 and Permit G-16917 of 63.5 cfs, the District and City anticipate full use of Permit G-16917 by 2080. By that time, Rockwood and Gresham intend to have enough well capacity to meet scenarios that would require appropriation of a total of 63.5 cfs. For example, a major fire coupled with high demand may cause the system to operate at maximum capacity to meet demand and replenish reservoirs. Consequently, the District and City expect to fully beneficially use Permit G-16917 by 2080.

5.3.1 Alternative Sources

OAR 690-086-0170(5)

OAR 690-086-0170(5) requires an analysis of alternative sources of water to see if any expansion or initial diversion of water allocated under existing permits is necessary to meet future water demand. The District and City intend to expand diversion of water under Permit G-16917 to meet future water demands, as described above. The following subsections analyze the extent to which the projected water needs can be met through other alternatives.

a. Conservation Measures

As described in Section 3, the District and City have been implementing a wide variety of water conservation measures to increase the water efficiency of their customers and their own use. Average day demand and seasonal water demand in summer months have shown a decrease over time, in part due to these conservation measures. The City and the District plan to continue their diverse array of conservation program activities and to monitor water use by customers. Both providers will reevaluate their conservation programs if water use begins to climb without concurrent customer growth. Although water conservation may delay the need for additional use of groundwater under Permit G-16917, it cannot eliminate the need to use this right.

b. Interconnections and Cooperative Regional Management

Until 2026, the District and City will obtain a significant portion of their water supply through interconnections with PWB, which is the largest water supplier in the region. As previously described, the District and City have formed a partnership known as the Cascade Groundwater Alliance. Beginning in 2026, the District and City will rely of this partnership to jointly develop and share groundwater sources of supply to meet their demands. Both of these scenarios embody the spirit of cooperative regional management sought by OWRD.

Neighboring water providers (other than PWB) do not have the source capacity to meet the additional future demands of the District and City. Consequently, the existing interconnections with these other providers will continue to serve only as emergency interconnections.

c. Cost Effectiveness

OAR 690-086-170(c) requires an assessment of whether the projected water needs can be satisfied through other conservation measures that would provide water at a cost that is equal to or less than the cost of other identified sources.

As described above, conservation can slow the need to develop additional groundwater under Permit G-16917, but cannot eliminate, regardless of the cost, the District's and City's need to increase its use of groundwater under Permit G-16917. Lastly, the District and City maintain robust conservation programs. These programs rival the most extensive programs in the state by leveraging resources with other water providers through participation in the RWPC. As a result, the District and City offer fixture rebates, perform extensive outreach campaigns, provide onsite water audits, and implement numerous other measures to ensure they remain good stewards of their water resources. Given the breadth of these programs, any other conservation measures would likely require potentially significant resources to adopt and implement, likely rivaling the long-term costs associated with further expansion of groundwater use under Permit G-16917. Thus, expanding use of Permit G-16917 is a cost-effective option for meeting the District's and the City's long-term demands.

5.3.2 Quantification of Projected Maximum Rate and Monthly Volume

OAR 690-086-0170(6)

OAR 690-086-0170(6) requires a quantification of the maximum rate of withdrawal and maximum monthly use if any expansion or initial diversion of water allocated under an existing permit is necessary to meet demands in the 20-year planning horizon. Within the next 20 years, the District and City are planning to need 23.98 cfs under Permit G-16917 to meet their combined projected water demands in 2042. Assuming that the water right is used at its 23.98 cfs (15.5 mgd), 24 hours per day for 31 days during the maximum month (likely July or August), the maximum monthly volume for the water right would be approximately 480.5 MG.

5.3.3 Mitigation Actions under State and Federal Law

OAR 690-086-0170(7)

Under OAR 690-086-0170(7), for expanded or initial diversion of water under an existing permit, the water supplier is to describe mitigation actions it is taking to comply with legal requirements of the Endangered Species Act, Clean Water Act, and other applicable state or federal environmental regulations. The District and City currently are not required to take any mitigation actions under state or federal law.

5.3.4 New Water Rights

OAR 690-086-0170(8)

Under OAR 690-086-0170(8), if a municipal water supplier finds it necessary to acquire new water rights within the next 20 years in order to meet its projected demand, an analysis of alternative sources of the additional water is required. The analysis must consider availability, reliability, feasibility and likely environmental impacts and a schedule for development of the new sources of water.

Neither the District nor the City currently plan to acquire new water rights within the next 20 years to meet projected demands. As described above, the District has a surface water application, but to date has not received a permit. Given the significant limitations that would be included on a permit issued for Application S-72354 (including expiration after 10 years), the District has not incorporated this potential permit into this WMCP analysis.

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Appendix A

Letters to Affected Governments and Comments Received

GSI Water Solutions, Inc.

January 10, 2023

Allan Berry
Public Works Director
City of Fairview
PO Box 337
Fairview, OR 97024-0337
berrya@ci.fairview.or.us

Subject: Draft Water Management and Conservation Plan for Rockwood Water People's Utility District and the City of Gresham

Dear Mr. Berry,

Rockwood Water People's Utility District and the City of Gresham have developed a draft Water Management and Conservation Plan (WMCP) to fulfill the requirements of Oregon Administrative Rules Chapter 690, Division 86 of the Oregon Water Resources Department.

Under these rules, the water supplier will make its draft WMCP available for review by affected local governments and seek comments related to consistency with the local governments' comprehensive land use plans. We are providing you an electronic version of the draft WMCP for your review.

Please provide any comments to me within 30 days from the date of this letter. If the WMCP appears consistent with your Comprehensive Land Use Plan, a letter or email response to that effect would be appreciated. You may send your comments to me at thenkle@gsiws.com. If you have any questions, please feel free to contact me at 971-236-2550. Thank you for your interest.

Sincerely,
GSI Water Solutions Inc.

Tim Henkle
Water Resources Consultant

Enclosure

GSI Water Solutions, Inc.

January 10, 2023

Andy Shaw
Interim Director Planning and Development
Metro
600 NE Grand Ave
Portland, OR 97232
andy.shaw@oregonmetro.gov

Subject: Draft Water Management and Conservation Plan for Rockwood Water People's Utility District and the City of Gresham

Dear Mr. Shaw,

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Please provide any comments to me within 30 days from the date of this letter. If the WMCP appears consistent with your Comprehensive Land Use Plan, a letter or email response to that effect would be appreciated. You may send your comments to me at thenkle@gsiws.com.

If you have any questions, please feel free to contact me at 971-236-2550. Thank you for your interest.

Sincerely,
GSI Water Solutions Inc.

Tim Henkle
Water Resources Consultant

Enclosure

GSI Water Solutions, Inc.

January 10, 2023

Kevin Cook, Senior Planner
Multnomah County
1600 SE 190th Avenue
Portland, Oregon 97233
Kevin.C.Cook@multco.us

Subject: Draft Water Management and Conservation Plan for Rockwood Water People's Utility District and the City of Gresham

Dear Mr. Cook,

Rockwood Water People's Utility District and the City of Gresham have developed a draft Water Management and Conservation Plan (WMCP) to fulfill the requirements of Oregon Administrative Rules Chapter 690, Division 86 of the Oregon Water Resources Department.

Under these rules, the water supplier will make its draft WMCP available for review by affected local governments and seek comments related to consistency with the local governments' comprehensive land use plans. We are providing you an electronic version of the draft WMCP for your review.

Please provide any comments to me within 30 days from the date of this letter. If the WMCP appears consistent with your Comprehensive Land Use Plan, a letter or email response to that effect would be appreciated. You may send your comments to me at thenkle@gsiws.com.

If you have any questions, please feel free to contact me at 971-236-2550. Thank you for your interest.

Sincerely,
GSI Water Solutions Inc.

Tim Henkle
Water Resources Consultant

Enclosure

GSI Water Solutions, Inc.

January 10, 2023

Greg Dirks
City Manager
City of Wood Village
24200 NE Halsey
Wood Village, OR 97060
GregD@WoodVillageOR.gov

Subject: Draft Water Management and Conservation Plan for Rockwood Water People's Utility District and the City of Gresham

Dear Mr. Dirks,

Rockwood Water People's Utility District and the City of Gresham have developed a draft Water Management and Conservation Plan (WMCP) to fulfill the requirements of Oregon Administrative Rules Chapter 690, Division 86 of the Oregon Water Resources Department.

Under these rules, the water supplier will make its draft WMCP available for review by affected local governments and seek comments related to consistency with the local governments' comprehensive land use plans. We are providing you an electronic version of the draft WMCP for your review.

Please provide any comments to me within 30 days from the date of this letter. If the WMCP appears consistent with your Comprehensive Land Use Plan, a letter or email response to that effect would be appreciated. You may send your comments to me at thenkle@gsiws.com.

If you have any questions, please feel free to contact me at 971-236-2550. Thank you for your interest.

Sincerely,
GSI Water Solutions Inc.

Tim Henkle
Water Resources Consultant

Enclosure

GSI Water Solutions, Inc.

January 10, 2023

Ray Young
City Manager
City of Troutdale
219 E Historic Columbia River Hwy
Troutdale, OR 97060
ray.young@troutdaleoregon.gov

Subject: Draft Water Management and Conservation Plan for Rockwood Water People's Utility District and the City of Gresham

Dear Mr. Young,

Rockwood Water People's Utility District and the City of Gresham have developed a draft Water Management and Conservation Plan (WMCP) to fulfill the requirements of Oregon Administrative Rules Chapter 690, Division 86 of the Oregon Water Resources Department.

Under these rules, the water supplier will make its draft WMCP available for review by affected local governments and seek comments related to consistency with the local governments' comprehensive land use plans. We are providing you an electronic version of the draft WMCP for your review.

Please provide any comments to me within 30 days from the date of this letter. If the WMCP appears consistent with your Comprehensive Land Use Plan, a letter or email response to that effect would be appreciated. You may send your comments to me at thenkle@gsiws.com.

If you have any questions, please feel free to contact me at 971-236-2550. Thank you for your interest.

Sincerely,
GSI Water Solutions Inc.

Tim Henkle
Water Resources Consultant

Enclosure

GSI Water Solutions, Inc.

January 10, 2023

Donnie Oliveira
Director
City of Portland Bureau of Planning and Sustainability
1810 SW Fifth Avenue
Portland, OR 97201
donald.oliveira@portlandoregon.gov

Subject: Draft Water Management and Conservation Plan for Rockwood Water People's Utility District and the City of Gresham

Dear Mr. Oliveira,

Rockwood Water People's Utility District and the City of Gresham have developed a draft Water Management and Conservation Plan (WMCP) to fulfill the requirements of Oregon Administrative Rules Chapter 690, Division 86 of the Oregon Water Resources Department.

Under these rules, the water supplier will make its draft WMCP available for review by affected local governments and seek comments related to consistency with the local governments' comprehensive land use plans. We are providing you an electronic version of the draft WMCP for your review.

Please provide any comments to me within 30 days from the date of this letter. If the WMCP appears consistent with your Comprehensive Land Use Plan, a letter or email response to that effect would be appreciated. You may send your comments to me at thenkle@gsiws.com.

If you have any questions, please feel free to contact me at 971-236-2550. Thank you for your interest.

Sincerely,
GSI Water Solutions Inc.

Tim Henkle
Water Resources Consultant
Enclosure

GSI Water Solutions, Inc.

January 10, 2023

Lusted Water District
PO Box 2026
Gresham, OR 97030
service@lustedwater.com

Subject: Water Management and Conservation Plan for Rockwood Water People's Utility District and the City of Gresham

To whom it may concern,

Rockwood Water People's Utility District and the City of Gresham have developed a draft Water Management and Conservation Plan (WMCP) to fulfill the requirements of Oregon Administrative Rule Chapter 690, Division 86 of the Oregon Water Resources Department.

Rockwood and Gresham are providing you with an electronic copy of the draft WMCP as a courtesy. If you have any questions, please feel free to contact me at 971-236-2550 or thenkle@gsiws.com.

Sincerely,
GSI Water Solutions Inc.

Tim Henkle
Water Resources Consultant

Enclosure

GSI Water Solutions, Inc.

January 10, 2023

Rebecca Geisen
Managing Director
Regional Water Providers Consortium
1120 SW 5th Ave
Portland, OR 97204
Rebecca.Geisen@portlandoregon.gov

Subject: Water Management and Conservation Plan for Rockwood Water People's Utility District and the City of Gresham

To whom it may concern,

Rockwood Water People's Utility District and the City of Gresham have developed a draft Water Management and Conservation Plan (WMCP) to fulfill the requirements of Oregon Administrative Rule Chapter 690, Division 86 of the Oregon Water Resources Department.

Given the relationship between Rockwood Water PUD, Gresham, and your water district, we are providing you with an electronic copy of the draft WMCP as a courtesy. If you have any questions, please feel free to contact me at 971-236-2550 or thenkle@gsiws.com.

Sincerely,
GSI Water Solutions Inc.

Tim Henkle
Water Resources Consultant

Enclosure

GSI Water Solutions, Inc.

January 16, 2023

Tom Caufield
Interlachen Water PUD
20101 NE Interlachen Lane
Fairview, OR 97024
Tecaufield@gmail.com

Subject: Draft Water Management and Conservation Plan for Rockwood Water People's Utility District and the City of Gresham

Dear Mr. Caufield,

Rockwood Water People's Utility District and the City of Gresham have developed a draft Water Management and Conservation Plan (WMCP) to fulfill the requirements of Oregon Administrative Rule Chapter 690, Division 86 of the Oregon Water Resources Department.

Rockwood and Gresham are providing you with an electronic copy of the draft WMCP as a courtesy. If you have any questions, please feel free to contact me at 971-236-2550 or thenkle@gsiws.com.

Sincerely,
GSI Water Solutions Inc.

Tim Henkle
Water Resources Consultant

Enclosure

600 NE Grand Ave.
Portland, OR 97232-2736
oregonmetro.gov

January 12, 2023

Tim Henkle
GSI Water Solutions, Inc.
1600 SW Western Blvd
Corvallis, OR 97333

Dear Tim:

Thank you for the opportunity to consider the January 2023 draft Water Management and Conservation Plan (WMCP) for the Rockwood Water People's Utility District and the City of Gresham.

While Metro has not assumed any function related to transmission, storage, or distribution of drinking water, my review of the draft WMCP finds that its efforts would be consistent with the following goals and policies of Metro's Regional Framework Plan:

- Ensuring current and future generations enjoy clean water;
- Promoting and achieving regional water conservation and demand management;
- Complying with state and federal water quality requirements; and
- Protecting beneficial water uses.

The draft WMCP is not inconsistent with provisions of Metro's Urban Growth Management Functional Plan. The efforts described in the draft WMCP are also not expected to have adverse impacts on Metro facilities or operations.

Sincerely,

Glen Hamburg
Associate Regional Planner

PORTLAND WATER BUREAU
FROM FOREST TO FAUCET

Mingus Mapps, Commissioner
Gabriel Solmer, Director

1120 SW Fifth Avenue, Room 405
Portland, Oregon 97204-1926
Information: 503-823-7404
Portland.gov/water

February 16, 2023

Tim Henkle
GSI Water Solutions
1600 SW Western Blvd., Suite 240
Corvallis, OR 97333

Dear Tim,

Thank you for providing the City of Portland the opportunity to review the City of Gresham and Rockwood Water Public Utility District's joint Water Management and Conservation Plan.

The Portland Water Bureau has reviewed the plan and does not have any substantive comments at this time. We appreciate the plan's attention to the increasing use of groundwater in the region and the potential for impacts to the bureau's senior groundwater rights. As joint users of the Sand and Gravel Aquifer, we would welcome collaboration to mitigate any future interference between our respective wells.

Please reach out if you have any questions.

Sincerely,

Sarah Murphy Santner
Director, Resource Protection and Planning

cc: Patricia Diefenderfer, Chief Planner
Portland Bureau of Planning and Sustainability

From: interlachenhoa@gmail.com
To: Molly Monroe
Subject: RE: Courtesy copy Rockwood Water PUD and the City of Gresham WMCP
Date: Tuesday, January 10, 2023 5:33:11 PM

Thank you for the documents.
I'm sure there has been a hydrology analysis for when Gresham starts pulling groundwater in 2026. The things that concern me, are, out by Blue Lake, we already have been negatively impacted by government decisions to use ground water as main drinking supplies.

Historically Blue Lake has been shown to have connectivity to Troutdale Sand and Gravel aquifers and the Blue Lake aquifer. Other than local rain runoff, there is no other water source for the lake. In 1982, the City of Portland built a 12" pipeline to the lake with a promise to add water when needed to supplement levels. They recognized the potential damage their Columbia South Shore Well field could do to the lake levels when they built their 16 well system near Blue Lake and the Columbia River.
Now Gresham is going to do the same thing – pulling water from wells that will lower water tables and quite possibly the water levels on Blue Lake.
Would at minimum like to see the impact studies, and statement addressing potential impact on Blue Lake.
Also, the IWPUD also has four wells on Interlachen Lane, and I'm sure they would like to understand the projected impact on water tables.

Thank you for your time on this.

Michael Vest
President
Interlachen HOA

From: Molly Monroe <mmonroe@gsiws.com>
Sent: Tuesday, January 10, 2023 5:07 PM
To: Interlachenhoa@gmail.com
Subject: Courtesy copy Rockwood Water PUD and the City of Gresham WMCP

Hello,
On behalf of the Rockwood Water PUD and the City of Gresham, please see the attached letter and a courtesy copy of the draft Water Management and Conservation Plan.
Thank you,
Molly-

Molly Monroe
Administrative Assistant
office: 541.257.9002
1600 SW Western Boulevard, Suite 240, Corvallis, OR 97333
GSI Water Solutions, Inc. | www.gsiws.com

Tim Henkle

From: Geisen, Rebecca <Rebecca.Geisen@portlandoregon.gov>
Sent: Friday, February 10, 2023 3:44 PM
To: Tim Henkle
Subject: Gresham/Rockwood WMCP

Hi Tim – hope all is well with you! Just a quick note about the Rockwood/Gresham WMCP in regards to the Regional Water Providers Consortium. On page 3-14 there is a reference to Metro being a member of the Consortium. They withdrew many years ago so you may want to remove that reference. We do have 25 members however.

Appreciate the opportunity to review.

Rebecca

Rebecca Geisen
she/her
Managing Director | Regional Water Providers Consortium
Intergovernmental Coordination Group Manager | Portland Water Bureau
P 503-823-7493 | rebecca.geisen@portlandoregon.gov
1120 SW 5th Ave. Room 405 | Portland, OR 97204
www.portlandoregon.gov/water | www.regionalh2o.org

From:	Ray Young
To:	Molly Monroe
Subject:	RE: Rockwood Water PUD and the City of Gresham WMCP
Date:	Tuesday, January 10, 2023 7:18:42 PM
Attachments:	image001.png

Thanks Molly. I will look it over.

Ray Young
City Manager
office: 503-674-7233 | cell: 503-702-1949
ray.young@troutdaleoregon.gov

CITY OF TROUTDALE
219 E. Historic Columbia River Hwy
Troutdale, OR 97060
website | facebook | twitter | instagram

From: Molly Monroe <mmonroe@gsiws.com>
Sent: Tuesday, January 10, 2023 4:45 PM
To: Ray Young <ray.young@troutdaleoregon.gov>
Subject: Rockwood Water PUD and the City of Gresham WMCP

Hello,
On behalf of the Rockwood Water People's Utility District and the City of Gresham, please see the attached letter and a copy of the draft Water Management and Conservation Plan. We look forward to hearing from you.
Sincerely,
Molly Monroe

Molly Monroe
Administrative Assistant
office: 541.257.9002
1600 SW Western Boulevard, Suite 240, Corvallis, OR 97333
GSI Water Solutions, Inc. | www.gsiws.com
pronouns: she, her

Appendix B

Regional Water Providers Consortium Program Summary Benefits 2021

The Consortium and its members have been working collaboratively since 1997 to ensure the Portland, Oregon metropolitan region has a long-term, reliable, efficient, and safe water supply. The three program areas of the Consortium focus on water conservation, emergency preparedness, and regional coordination.

Water Conservation

The Consortium's Water Conservation program is focused on increasing the public's understanding of water as a valuable regional resource through public outreach campaigns and other programming and contains the following key elements:

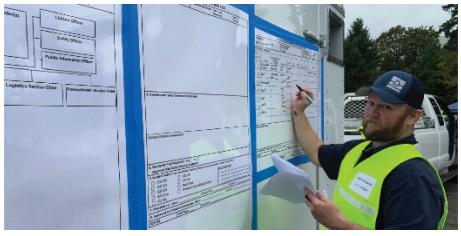
1. Multimedia Outreach Campaigns
    - Conducts two campaigns annually that focus on indoor and outdoor conservation messaging which is delivered via television, radio, and digital platforms
    - Month-long indoor campaign that typically runs in the winter; three-month outdoor campaign that always runs in the summer
    - Outreach content is provided in English and contains some elements in Spanish
2. Outreach Materials and Conservation Devices
    - Provides a collection of more than 25 print pieces (some available in Spanish) and several table-top displays for use by members; Consortium members receive a free start-up supply of each newly developed print piece and can order materials annually
    - Distributes conservation devices to members' customers through annual promotions
    - Maintains a conservation section of www.regionalh2o.org (most content also in Spanish)
    - Hosts 14 how-to videos (one in Spanish)
    - Manages the Weekly Watering Number email, text services, and widget (available for members)
    - Develops and posts social media content for Facebook and Twitter; provides members with monthly pre-written content and images for use on their websites, newsletters, and social media
    - Distributes Regionalh2o News, a public-facing newsletter, every other month
3. School Assembly Programs and Sponsorship of the Children's Clean Water Festival
    - Develops and provides interactive school assembly programs to approximately 4,000 K-5 students; each member receives one Consortium-sponsored show and the opportunity to schedule additional presentations at a set cost
    - Sponsor of the annual Children's Clean Water Festival which includes more than 40 hands-on, water-focused activities, classroom presentations, and stage shows which reinforce STEM, Common Core, and Next Generation Science concepts and reaches about 1,400 fourth grade students from around the region (virtual festival this year)
4. Community Events and Workshops
    - Represents water providers at key regional outreach events to distribute outreach materials and conservation devices to attendees

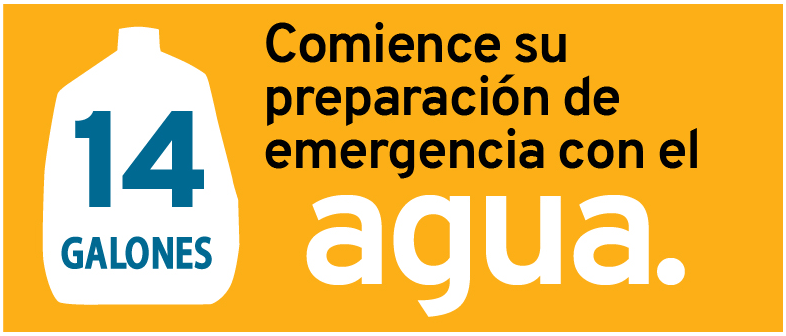
"One of the important things that the Consortium does is bringing a continuity of messaging, specifically around water conservation and emergency preparedness, for water providers who are working together in a common media market."
– Conservation Program Manager Sarah Santner, Portland Water Bureau

Emergency Preparedness

Water providers work together to plan for events that could impact local water supplies to ensure water is available when customers need it – even during an emergency. We prepare ourselves and others with the following program areas:

1. Drills and Tabletop Exercises
    - Facilitates large-scale tabletop exercises and drills for water providers to practice working together and using emergency equipment and other tools to address realistic scenarios that may affect the region's water supplies
2. Multimedia Outreach Campaigns
    - Conducts a month-long campaign each September that focuses on water-related preparedness information which is delivered via television, TriMet bus ads, and digital platforms
    - Outreach is provided in English and some Spanish
3. Urban Area Security Initiative (UASI) Grants
    - Works with the Regional Disaster Preparedness Organization (RDPO) to assist water providers in acquiring and administering grants for disaster preparedness resources including regional interconnection and emergency water supply studies and equipment (over $2.5 million to date)
4. Outreach Materials
    - Provides two print pieces in 10 languages, branded emergency water storage bags, and one tabletop display for use by members; Consortium members receive a free start-up supply of each newly developed print piece and can order materials annually
    - Maintains an emergency preparedness section of www.regionalh2o.org (most content in Spanish)
    - Hosts four how-to videos (one in Spanish)
    - Develops and posts social media content for Facebook and Twitter; provides members with monthly pre-written content and images for use on their websites, newsletters, and social media
    - Distributes Regionalh2o News, a public-facing newsletter, every other month





Regional Coordination

Consortium members have worked together for more than 20 years, building relationships and working collaboratively on issues of mutual interest. Here are some examples:

1. Source Water Protection Television Campaign
    - Conducts year-long campaign with other partner organizations that is designed to increase the public's awareness of actions they can take to protect source water
2. Population and Household Estimates and Forecasts
    - Consortium members receive annual population and household estimates and forecasts from the Portland State University Population Research Center; this data, based on each member's water service area boundary, is critical for accurate water demand forecasting
3. Resource-Sharing
    - Distributes "The Source", a quarterly e-newsletter for Consortium members, that includes regional news, program updates, and other resources
    - Facilitates a network of peers that members can rely on for information, expertise, resources, and sub-regional partnerships
    - Develops member resources such as a regional emergency contract list and a mutual aid shared worker agreement (the agreement can be accessed through the Oregon Water/Wastewater Agency Response Network).
4. Drinking Water Advisory Tool
    - Hosts an online address look-up tool for the public to use during a drinking water advisory to quickly determine who their water provider is and if their water quality or availability has been affected; tool functions as a water provider look-up tool when no water advisories are occurring; widget is available for use on member websites
5. Water Communicators Network
    - Connects regional Public Information Officers and other outreach staff to share best practices and resources, discuss and identify emerging issues, and support each other's work while retaining individual authority and accountability
6. Legislative Advocacy
    - Participates in committees and tracks legislation, opportunities, and resources with local, regional, state, and national groups including: Alliance for Water Efficiency, American Water Works Association, Irrigation Association, Oregon Landscape Contractors Association, Oregon Office of Emergency Management, Oregon Water/Wastewater Agency Response Network, Oregon Water Utilities Council, Regional Disaster Preparedness Organization, and Oregon Water Resources Department

Beaverton, City of
Clackamas River Water
Cornelius, City of
Forest Grove, City of
Gladstone, City of
Gresham, City of
Hillsboro, City of
Lake Oswego, City of
Milwaukie, City of
Newberg, City of
Oak Lodge Water Services
Portland, City of
Raleigh Water District
Rockwood Water PUD
Sandy, City of
Sherwood, City of
South Fork Water Board
Sunrise Water Authority
Tigard, City of
Tualatin, City of
Tualatin Valley Water District
Troutdale, City of
West Slope Water District
Wilsonville, City of

Benefits of Consortium Membership	Estimated Annual Value
The Consortium's conservation program meets public education requirements of **OAR Division 86** Water Management and Conservation Plans (WMCP).	Intangible
Annual multimedia outreach campaigns focused on conservation, emergency preparedness, and source water protection messaging in English and Spanish.	$157,347 investment nets $233,623 in-kind contributions
Liaison with the Regional Disaster Preparedness Organization to assist water providers in acquiring more than **$2.5 million** in grants for interconnection studies and water treatment and distribution equipment.	Intangible
Branded outreach print pieces, conservation devices, and emergency water bags provided in a start-up supply (50 copies of all Consortium print pieces) to new members and available for bulk purchase annually (using economies of scale to bring down the overall cost).	$1,100 value versus $2,000 - $6,000 if purchased as a single entity
Conservation and emergency preparedness kit promotions that water providers can advertise to their customers, providing them with access to free conservation and emergency preparedness outreach materials and devices.	$4.00 - $15.00 per kit
Population and Household Estimates and Forecasts are updated annually by the Portland State University Population Research Center based on each member's water service area boundary.	$4,000
The Drinking Water Advisory Tool is available for member use when issuing a water advisory pertaining to water quality or availability affecting their customers.	$5,000
Co-sponsorship of the Children's Clean Water Festival ensures fourth grade students throughout the region have an opportunity to learn about water in a day-long, interactive festival.	$3,000
Provides one Consortium-sponsored water conservation-themed school assembly show each year.	$315
Ready-to-use water conservation and emergency preparedness messaging and images including newsletter articles, social media posts, graphics, presentations, tabletop displays, and web content.	$10,000+
Other Benefits	
Speak with one voice on issues affecting water providers. Examples include cyanotoxins, summer supply messaging, COVID-19, 2020 wildfires, and writing letters in support or opposition to proposed water-related legislation.	
Established network of peers. By participating in the Consortium, water provider staff, managers, and their elected officials have access to subject matter experts, sub-regional partnership opportunities, and the ability to develop and share resources with one another.	
Represent water providers and their interests. Consortium staff participate in working committees and track water-related information, legislation, opportunities, and resources with a variety of local, regional, state, and national groups. This information is shared at committee meetings and via email.	

Appendix C

City of Gresham Water Utility Rates

CITY OF GRESHAM OREGON

Water Utility Rates

The water portion of your utility bill has three charges:

- Water consumption charge (water use)
- Water service charge
- Fire flow charge

	2021 Rates	2022 Rates
Average monthly utility charge for water service	$44.22	$46.46
This includes a water base charge	$26.70	$28.04
Water consumption charge (multiplied by the average use of six units per month)	$2.92/unit = $17.52	$3.07/unit = $18.42

Utility bills are mailed every other month and reflect service charges for two months.

Water consumption charge

Water use is measured in units. One unit is 748 gallons of water, equivalent to 100 cubic feet (ccf).

- The water consumption charged is based entirely on the amount of water used during the two-month billing period.
- Each customer can reduce this portion of their water bill by conserving and using less water.

Cost per unit, single family and dedicated irrigation

	2021 Rates	2022 Rates
0-34 units	$2.92	$3.07
35-54 units	$3.53	$3.71
More than 54 units	$4.41	$4.63

Water service charge

The water service charge is based on the water meter size. Most residential customers have a 5/8-inch meter, which costs $20.54 per month. Effective Jan. 1, 2022 this cost increased to $21.57.

Fire flow charge

The fire flow charge is for each domestic water service connection to the City's public water system.

Most residential customers have a 501-1,000-gallon fire flow, which costs $6.16 per month. Effective Jan. 1, 2022 this cost increased to $6.47 per month.

Contact us

For more information contact Utilities at 503-618-2373 or UtilityBilling@GreshamOregon.gov.

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RESOURCES

Emergency Alerts

Maps

My Gresham

INITIATIVES

Strategic Plan

Homeless Services

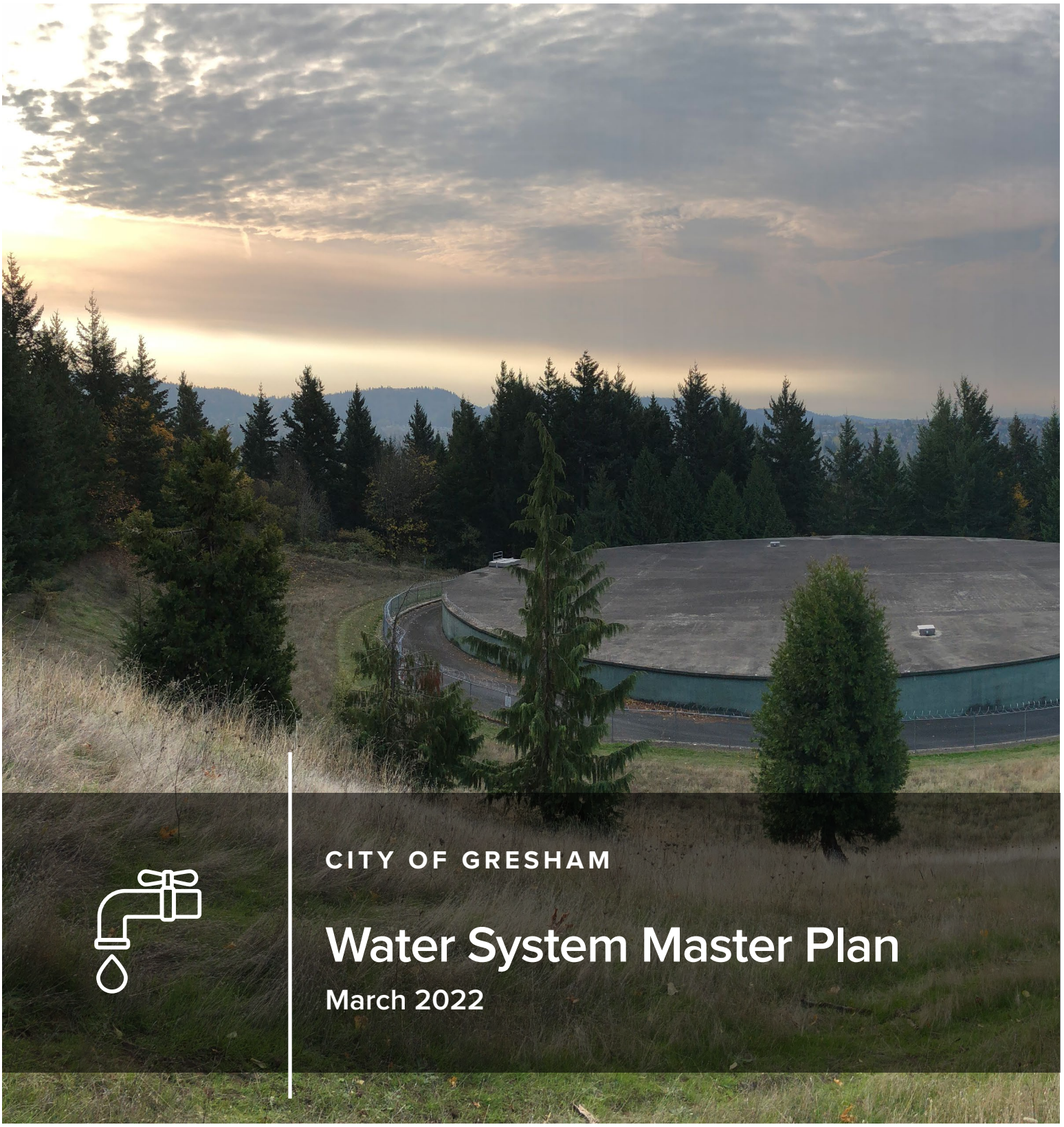
Recreation

GRESHAMOREGON.GOV

Appendix D

City of Gresham WSMP Forecast Excerpt

murraysmith



CITY OF GRESHAM

Water System Master Plan

March 2022

2.4.4 Equivalent Dwelling Units

The City's public water system serves single-family residential customers and a significant number of multifamily housing developments and commercial customers. Single-family residential water services generally have a consistent daily and seasonal pattern of water use or demand. Water demands for multifamily residence, commercial, and industrial users may vary significantly from service to service depending on the number of multifamily units per service or the type of commercial enterprise. When projecting future water demands based on population change, the water needs of non-residential and multi-family residential customers are represented by comparing their water use volume to the average single-family residential unit. The number of single-family residential units that could be served by the water demand of these other types of customers is referred to as the number of "equivalent dwelling units" (EDUs). EDUs differ from actual metered service connections in that they relate all water services to an equivalent number of representative single-family residential services based on typical annual consumption.

In order to establish the average consumption per EDU, the total number of single-family residential service connections is compared to the total consumption by single-family residential customers. Residential ADD divided by the number of base size meters is the average demand per EDU (ADD/EDU in gpd/EDU). Average consumption per EDU (ADD/EDU) is anticipated to remain constant through time and based on the 2012 WSMP calculations using 2011 water consumption records, assumed to be 184 gpd/EDU.

2.5 Future Water Demand Forecast

Future water demands were projected based on historical data, population forecasts, and growth trends. Projections take into account anticipated growth in new development areas, specifically in the Pleasant Valley and Springwater areas, and estimated water loss. Table 2-4 presents future demand projections by customer type as well as the projected EDUs and projected MDD through 2050.

Table 2-4 | Future Water Demand Projections by Customer Type (mgd)

	Single-family Residential	Multi-family Residential	Commercial	Industrial	Public/City	Total ADD[1]	EDUs	MDD
2022	2.8	1.5	0.8	0.4	0.2	6.0	32534	10.2
2023	2.9	1.5	0.8	0.4	0.2	6.1	32884	10.3
2024	2.9	1.5	0.8	0.4	0.2	6.1	33275	10.4
2025	2.9	1.5	0.8	0.4	0.2	6.2	33713	10.5
2026	3.0	1.6	0.8	0.5	0.2	6.3	34122	10.7
2027	3.0	1.6	0.8	0.5	0.2	6.4	34540	10.8
2028	3.0	1.6	0.8	0.5	0.2	6.4	34966	10.9
2029	3.1	1.6	0.8	0.5	0.2	6.5	35402	11.1
2030	3.1	1.6	0.8	0.6	0.2	6.6	35850	11.2
2031	3.1	1.6	0.8	0.6	0.2	6.7	36297	11.4
2032	3.2	1.6	0.8	0.6	0.2	6.8	36759	11.5
2033	3.2	1.6	0.8	0.7	0.2	6.9	37237	11.6
2034	3.2	1.6	0.8	0.7	0.2	6.9	37731	11.8
2035	3.3	1.6	0.8	0.7	0.2	7.0	38244	12.0
2036	3.3	1.6	0.8	0.8	0.2	7.1	38756	12.1
2037	3.3	1.7	0.9	0.8	0.2	7.2	39292	12.3
2038	3.4	1.7	0.9	0.9	0.2	7.3	39854	12.5
2039	3.4	1.7	0.9	1.0	0.2	7.4	40445	12.7
2040	3.4	1.7	0.9	1.0	0.2	7.6	41068	12.8
2041	3.5	1.7	0.9	1.1	0.2	7.7	41663	13.0
2042	3.5	1.7	0.9	1.2	0.2	7.8	42300	13.2
2043	3.5	1.7	0.9	1.3	0.2	7.9	42984	13.4
2044	3.5	1.7	0.9	1.4	0.2	8.0	43719	13.7
2045	3.6	1.7	0.9	1.5	0.2	8.2	44514	13.9
2046	3.6	1.7	0.9	1.6	0.2	8.3	45359	14.2
2047	3.6	1.7	0.9	1.7	0.2	8.5	46259	14.5
2048	3.6	1.7	0.9	1.9	0.2	8.7	47216	14.8
2049	3.7	1.7	0.9	2.0	0.2	8.9	48237	15.1
2050	3.7	1.7	0.9	2.2	0.2	9.1	49327	15.4

Note:
1. Includes estimated water loss of 5%.

2.5.1 Residential Water Demand

Population projections were the basis for estimated residential water demand. Population forecasts for the City's Water Service Area published by the Population Research Center (PRC, Portland State University, August 2014) include U.S. census population data from 2010 and estimated population from 2013 through 2045. While these forecasts have not been updated for

the City's Water Service Area since 2014, city-wide population estimates were updated through 2019, showing that actual population growth in the City has been slower than the 2014 forecast.

The PRC also provides growth rates for Multnomah County. These estimates indicate that within the county, growth is anticipated to occur at a rate of 1.14 percent through 2020, slowing to 0.7 percent by 2040. Within the City's Water Service Area, population growth has averaged 0.52 percent per year since 2010.

For the purposes of this WSMP, it is assumed that the City's Water Service Area growth over the next five years will be slow, near the current average growth rate of 0.52 percent, due to current uncertainties in the economy. After a period of slow growth, a period of high growth is estimated at 1.16 percent beginning in 2025 and gradually decreasing through 2050. This gradual reduction follows the original growth rate trend from the 2014 PRC population projections for the City's Water Service Area.

Using the 2019 city-wide population estimate and residential water consumption data provided by the City for 2016 through 2019, the average use per capita per day was calculated. Note that this is for combined single and multi-family consumption. The average per capita use was 59 gallons per capita per day (gpcd) between 2016 and 2019. To estimate future residential water demand, 60 gpcd is used.

2.5.2 Non-residential Water Demand

Commercial, Industrial, Public, and City water use projections are based on consumption data from 2016 through 2019. Commercial and Public/City demands are expected to increase proportional to residential demand, as described in Section 2.5.1: slow for the next five years followed by a period of higher growth that tapers off through 2050.

Industrial use has decreased in the past ten years; however, moderate growth is projected in the next five years. While significant industrial development is anticipated, these developments are currently in "concept" phase, and it is expected that growth in industrial demand will be slow but gradually increase through 2050, tapering off after that.

2.5.3 Non-revenue Water Demand

Non-revenue water is the amount of water produced that is not billed to a customer. This generally includes water losses in the distribution system, unauthorized use, and authorized unbilled use such as hydrant flushing for water quality. This water must be accounted for in demand projections to ensure proper infrastructure sizing. Non-revenue water is estimated as the difference between billed consumption and production.

Non-revenue water is projected using historical data. The percent of 2016 to 2019 water production that was non-revenue varied between three and six percent. Future non-revenue water is estimated as five percent of future production.

2.5.4 Maximum Day Peaking Factor

The average maximum day peaking factor from 2011 to 2019 was 1.65 and ranged from 1.57 to 1.77 as presented in Table 2-1. A peaking factor of 1.7 was used to project MDDs.

2.5.5 Build-out Water Demand

Population growth is expected to continue beyond the planning horizon of this WSMP and likely beyond the estimated build-out year 2100. Build-out population was projected in the 2012 WSMP by estimating available land for infill growth as well as the expected growth in the Pleasant Valley and Springwater development areas. Build-out projections from the 2012 WSMP are assumed to remain accurate for planning purposes, although the timing of growth is anticipated to be slower based on updated PRC population forecasts. For the residential, commercial, public, and city categories, growth is considered near build-out at the year 2050. Build-out for industrial demand is assumed to extend past 2050, given the substantial amount of industrial growth expected.

2.6 Future Water Demand by Service Level

Projected future water demand by service level is summarized in Table 2-5. These demands are used with the performance criteria presented in Section 3 to analyze the capacity of water facilities supplying each zone. Additional demand assigned to each service level is based on known developable areas as well as infill proportional to the population projections. New developments may be served from future facilities described in the distribution system analysis presented in Section 5.

Table 2-5 | Estimated Future Water Demand by Service Level

Service Level	ADD (mgd)				MDD (mgd)			
	2025	2030	2040	2050	2025	2030	2040	2050
Gabbert	0.03	0.03	0.03	0.04	0.05	0.05	0.06	0.07
Grant Butte	2.78	2.79	2.88	3.24	4.73	4.75	4.89	5.50
Hunters Highland	0.19	0.22	0.23	0.24	0.33	0.38	0.39	0.40
Intermediate	2.02	2.28	2.57	2.91	3.43	3.88	4.37	4.95
Lusted	0.54	0.60	0.96	1.35	0.92	1.02	1.64	2.29
South Hills	0.32	0.35	0.50	0.62	0.54	0.59	0.84	1.05
South Shore	0.31	0.32	0.39	0.69	0.53	0.55	0.66	1.17
Total	**6.20**	**6.60**	**7.56**	**9.08**	**10.53**	**11.22**	**12.85**	**15.44**