Final

Water Management and Conservation Plan

City of Cottage Grove

July 2021

Prepared by:

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Oregon
Kate Brown, Governor

Water Resources Department
North Mall Office Building
725 Summer St NE, Ste A
Salem, OR 97301
Phone: 503-986-0900
Fax: 503-986-0904
www.Oregon.gov/OWRD

July 28, 2021

City of Cottage Grove
Attn: Faye Stewart, Public Works Director
400 E. Main St.
Cottage Grove, OR 97424

Subject: Water Management and Conservation Plan

Dear Ms. Stewart:

Enclosed; please find the final order approving your Water Management and Conservation Plan and authorizing the diversion of up to 3.1 cfs of water under Permit S-42117.

The attached final order specifies that the City of Cottage Grove's plan shall remain in effect until **July 28, 2031.** Additionally, the City of Cottage Grove is required to submit a progress report to the Department by **July 28, 2026**, detailing progress made toward the implementation of conservation benchmarks scheduled in the plan. Finally, the City of Cottage Grove must submit an updated Water Management and Conservation Plan to the Department by **January 28, 2031**.

NOTE: *The deadline established in the attached final order for submittal of an updated water management and conservation plan (consistent with OAR Chapter 690, Division 086) shall not relieve the City of Cottage Grove from any existing or future requirement(s) for submittal of a water management and conservation plan at an earlier date as established through other final orders of the Department.*

We appreciate your cooperation in this effort. Please do not hesitate to contact me at 503-979-9544 or *Kerri.H.Cope@oregon.gov* if you have any questions.

Sincerely,

Kerri H. Cope

Kerri Cope
Water Management and Conservation Analyst
Water Right Services Division

Enclosure

cc: WMCP File
Application #S-55338 (Permit #S-42117)
Watermaster #2, Lanaya Blakely *(via email)*
GSI Water Solutions, Inc. Attn: Kim Grisby *(via email)*

BEFORE THE WATER RESOURCES DEPARTMENT
OF THE
STATE OF OREGON

In the Matter of the Proposed Water Management and Conservation Plan for City of Cottage Grove, Lane County	)))	FINAL ORDER APPROVING A WATER MANAGEMENT AND CONSERVATION PLAN

Authority

OAR Chapter 690, Division 086, establishes the process and criteria for approving water management and conservation plans required under the conditions of permits, permit extensions and other orders of the Department. An approved water management and conservation plan may authorize the diversion and use of water under a permit extended pursuant to OAR Chapter 690, Division 315.

Findings of Fact

1. The City of Cottage Grove submitted a Water Management and Conservation Plan (plan) to the Water Resources Department (Department) on March 3, 2021. The required statutory fee for review of the plan was received by the Department on March 8, 2021. The plan was required by a condition set forth in the final order issued on July 16, 2021 approving an extension of time for Permit S-42117.

2. The Department published notice of receipt of the plan on March 16, 2021, as required under OAR Chapter 690, Division 086. No comments were received.

3. The Department provided written comments on the plan to the City on May 21, 2021. In response, the City submitted a revised plan on June 23, 2021.

4. The Department reviewed the revised plan and finds that it contains all the elements required under OAR 690-086-0125 and OAR 690-086-0130.

5. The projections of future water need in the plan demonstrate a need for **3.1 cfs** of water available under **Permit S-42117** to help meet overall projected 20-year demands. These projections are reasonable and consistent with the City's land use plan.

6. The system is fully metered and the rate structure includes a base rate and volumetric charge. Unaccounted-for water is estimated at 14.5 percent.

This is a final order in other than a contested case. This order is subject to judicial review under ORS 183.484. Any petition for judicial review must be filed within the 60-day time period specified by ORS 183.484(2). Pursuant to ORS 536.075 and OAR 137-004-0080, you may petition for judicial review or petition the Director for reconsideration of this order. A petition for reconsideration may be granted or denied by the Director, and if no action is taken within 60 days following the date the petition was filed, the petition shall be deemed denied.

7. The plan includes 5-year benchmarks for continuation and/or implementation of an annual water audit program; system-wide metering; a meter testing and maintenance program; technical assistance program that aids in customer leak detection; a water reuse program for irrigation purposes; and a water rate structure that encourages conservation,

8. The plan includes benchmarks for the implementation of the following conservation measures:

    a. Annual Water Audit benchmark

        i. Within two (2) years of approval of this plan, the City shall provide to the Department a description and analysis identifying potential factors for their water loss.

        ii. If the above identified analysis does not result in water losses below 10% or less, within five (5) years of approval of this plan, the City shall develop and implement a water loss control program as required per OAR 690-086-0150(4)(e)(B)(i).

    b. Public Education

        i. Within five (5) years of approval of this plan, the City shall establish a mixed-media water education campaign that includes an annual bill stuffer; an annual radio broadcast; a new web page; written materials to distribute annually at City events; and an article in the City's annual CCR.

        ii. Withing five (5) years, the City shall also approach the local high school's tech class requesting the students develop a water conservation video to display on the local public television station.

    c. Technical and Financial Assistance program

        i. Within two (2) years of approval of this plan, the City shall make leak detection kits available to customers at a minimum of one City event and at City Hall.

    d. Supplier Financed Retrofit or Replacement of Inefficient Fixtures

        i. Within two (2) years of approval of this plan, the City shall make free low-flow showerheads and faucets available to customers at a minimum of one City event and at City Hall.

9. The plan identifies multiple surface water rights that include Coast Fork Willamette River, Layng Creek, Dinner Creek, Prather Creek, and the Row River as the sources of the City's water rights. The revised plan accurately and completely describes the listed fish species that occur in the Upper Willamette Basin which includes the Row and Coast Fork Willamette Rivers in the vicinity of the City's points of diversion as well as the water quality parameters for which this portion of Coast Fork Willamette and Row River have been 303(d) listed by the Oregon Department of Environmental Quality. The City's groundwater source is not in a designated critical groundwater area.

10. The water curtailment element included in the plan satisfactorily promotes water curtailment practices and includes a list of three stages of alert with concurrent curtailment actions.

11. The diversion of water under Permit S-42117 will be initiated during the next 20 years and is consistent with OAR 690-086-0130(7), as follows:

    a. The revised plan meets OAR 690-086-0130(7)(a) as evidenced by the 5-year benchmarks described in Findings of Fact #7 and #8, that includes a schedule for the continuation and/or implementation of conservation measures that would provide water at a cost that is equal to or lower than the cost of other identified sources;

    b. The revised plan meets OAR 690-086-0130(7)(b) by establishing that increased use from Permit S-42117 is the most feasible and appropriate water supply alternative available to the City; and

    c. The revised plan meets OAR 690-086-0130(7)(c), by containing documentation that the City will continue to comply with all mitigation requirements.

Conclusion of Law

The Water Management and Conservation Plan submitted by the City of Cottage Grove is consistent with the criteria in OAR Chapter 690, Division 086.

Now, therefore, it is ORDERED:

Duration of Plan Approval:

1. The City of Cottage Grove Water Management and Conservation Plan is approved and shall remain in effect until **July 28, 2031**, unless this approval is rescinded pursuant to OAR 690-086-0920.

Development Limitation:

2. The limitation of the diversion of water under **Permit S-42117** established by the extension of time approved on July 16, 2021 is removed and, subject to other limitations or conditions of the permit, the City of Cottage Grove is authorized to divert up to **3.1 cfs** (*out of the total permitted 3.1cfs*) under **Permit S-42117**.

Plan Update Schedule:

3. The City of Cottage Grove shall submit an updated plan meeting the requirements of OAR Chapter 690, Division 086 (effective December 23, 2018) within **10 years** and no later than **January 28, 2031**.

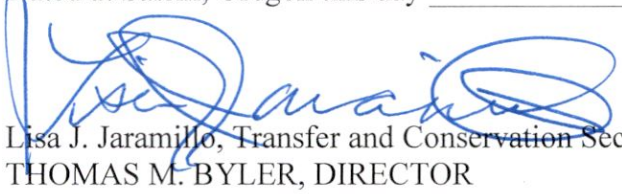
Progress Report Schedule:

4. The City of Cottage Grove shall submit a progress report containing the information required under OAR 690-086-0120(4) by **July 28, 2026**.

Other Requirements for Plan Submittal:

5. The deadline established herein for the submittal of an updated Water Management and Conservation Plan (consistent with OAR Chapter 690, Division 086) shall not relieve the City of Cottage Grove from any existing or future requirement(s) for submittal of a Water Management and Conservation Plan at an earlier date as established through other final orders of the Department.

Dated at Salem, Oregon this day JUL 28 2021



Lisa J. Jaramillo, Transfer and Conservation Section Manager for
THOMAS M. BYLER, DIRECTOR
Oregon Water Resources

Mailing date: JUL 29 2021

Notice Regarding Service Members: Active duty service members have a right to stay these proceedings under the federal service members Civil Relief Act. For more information, contact the Oregon State Bar at 800-452-8260, the Oregon Military Department at 503-584-3571 or the nearest United States Armed Forces Legal Assistance Office through http://legalassistance.law.af.mil. The Oregon Military Department does not have a toll free telephone number.

Contents

Index of Exhibits

Appendices

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1. WMCP Overview

This section satisfies the requirements of 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 City of Cottage Grove (City) was incorporated in 1887. The third largest city in Lane County, this historic mining and logging community lies about 25 miles south of the Eugene/Springfield metropolitan area along the I-5 corridor, at the southern end of the Willamette Valley. The City is framed by two rivers and intersected by major north-south transportation routes (highways and railroad line) that have shaped the City's growth and development. The City saw strong growth in the early 20th century due to the wood products industry, until changes to the industry drastically curtailed growth in the 1980s. The City has since diversified its economy through a combination of education, tourism, service, and agriculture.

The large number of historic covered bridges preserved over the many water bodies have contributed to the city's moniker of the "Covered Bridge Capital of Oregon", including the Row River and the Coast Fork of the Willamette River. Both of these rivers converge to the north of the City limits with the Row River being the City's current source of water supply. The public water system is owned and operated by the City and currently serves over 10,000 residents with approximately 3,800 metered accounts. The City's Public Water System Identification Number is 0236.

The purpose of this Water Management and Conservation Plan (WMCP) is to guide development of water management and conservation programs that promote efficient water use and ensure the City's future supply will meet the City's growing demands.

1.2 Plan Requirement

This is the City's first WMCP and is a condition of an approved permit extension. The Oregon Water Resources Department (OWRD) issued a final order on July 16, 2021 that extended the development deadline for the unperfected portion of the City's Permit S-42117, which authorizes the use of 3.1 cfs of water from the Row River. OWRD's final order includes a condition stating that access to water under extended Permit S-42117 is contingent on a final order approving a WMCP and that the required WMCP must be submitted to the OWRD within 3 years of approval of the extension.

This WMCP meets all of the requirements of the Oregon Administrative Rules (OAR) adopted by the Water Resources Commission in November 2018 (OAR Chapter 690, Division 86) regarding WMCPs.

1.3 Plan Organization

OAR 690-086-0125(1)-(4)

The WMCP is organized into the following sections, each addressing specific sections of OAR Chapter 690, Division 86.

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

Section 2 is a self-evaluation of the City's water supply, water use, water rights, and water system. The later sections use information from Section 2 to consider how the City can improve its water management and conservation efforts.

The City has relied on information from the following sources in preparing this plan:

- City staff
- Water Master Plan [Balfour Consulting], 1998]
- Oregon Water Resources Department (OWRD)
- Portland State University Population Research Center

1.4 Affected Governments

OAR 690-086-0125(5)

Thirty days before submitting this WMCP to OWRD, the City made the draft WMCP available for review by the affected local government listed below along with a request for comments relating to consistency with the local government's comprehensive land use plan. The letter requesting comment is found in Appendix A; no comments were received.

The following local government may be affected by this WMCP:

- Lane County

In addition, the City provided the Lamontai Improvement District, the Coast Fork Watershed Council, and the Row River Valley Water District with a copy of the draft plan as a courtesy.

1.5 Plan Update Schedule

OAR 690-086-0125(6)

The City anticipates submitting an update of this WMCP within 10 years of the final order approving this WMCP. As required by OAR Chapter 690, Division 86, a progress report will be submitted within five years of the final order.

1.6 Time Extension

OAR 690-086-0125(7)

The City is not requesting additional time to implement metering or a previous benchmark.

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2. Water Supplier Description

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

This rule requires descriptions of the City's 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 City's customers and their water use, the water system, interconnections with other water suppliers, and quantification of water loss.

2.1 Water Sources

OAR 690-086-0140(1)

The City currently obtains all of its municipal water supply from surface water through an intake facility located on the Row River near its water treatment plant (WTP) east of the City's service area. In addition to the Row River as a source of supply, the City also holds water rights that allow the use of water from Dinner, Prather, and Layng Creeks, which are tributaries of the Row River. The City has two other, currently unused water sources. First, the City has a water right on the Coast Fork Willamette River for the purpose of municipal fire suppression. Second, the City has a groundwater right that authorizes appropriation from a well adjacent to the Row River WTP; the City has not used groundwater in recent years due to declining well production capacity. The City has two in-line distribution system reservoirs.

2.2 Agreements and Contracts

OAR 690-086-0140(1)

The City has an intergovernmental agreement with the Lamontai Improvement District to supply wholesale water on an as-needed basis. This agreement was executed in 2018. The City does not hold any other agreements or contracts with other municipal water supply systems, nor does the City have exchange agreements or water supply or delivery contracts with other municipal or non-municipal water supply systems.

2.3 Interconnections with Other Systems

OAR 690-086-0140(7)

The City does not have any interconnections with other systems, however an interconnection with the Lamontai Improvement District will be constructed as part of the City and District's 2018 agreement.

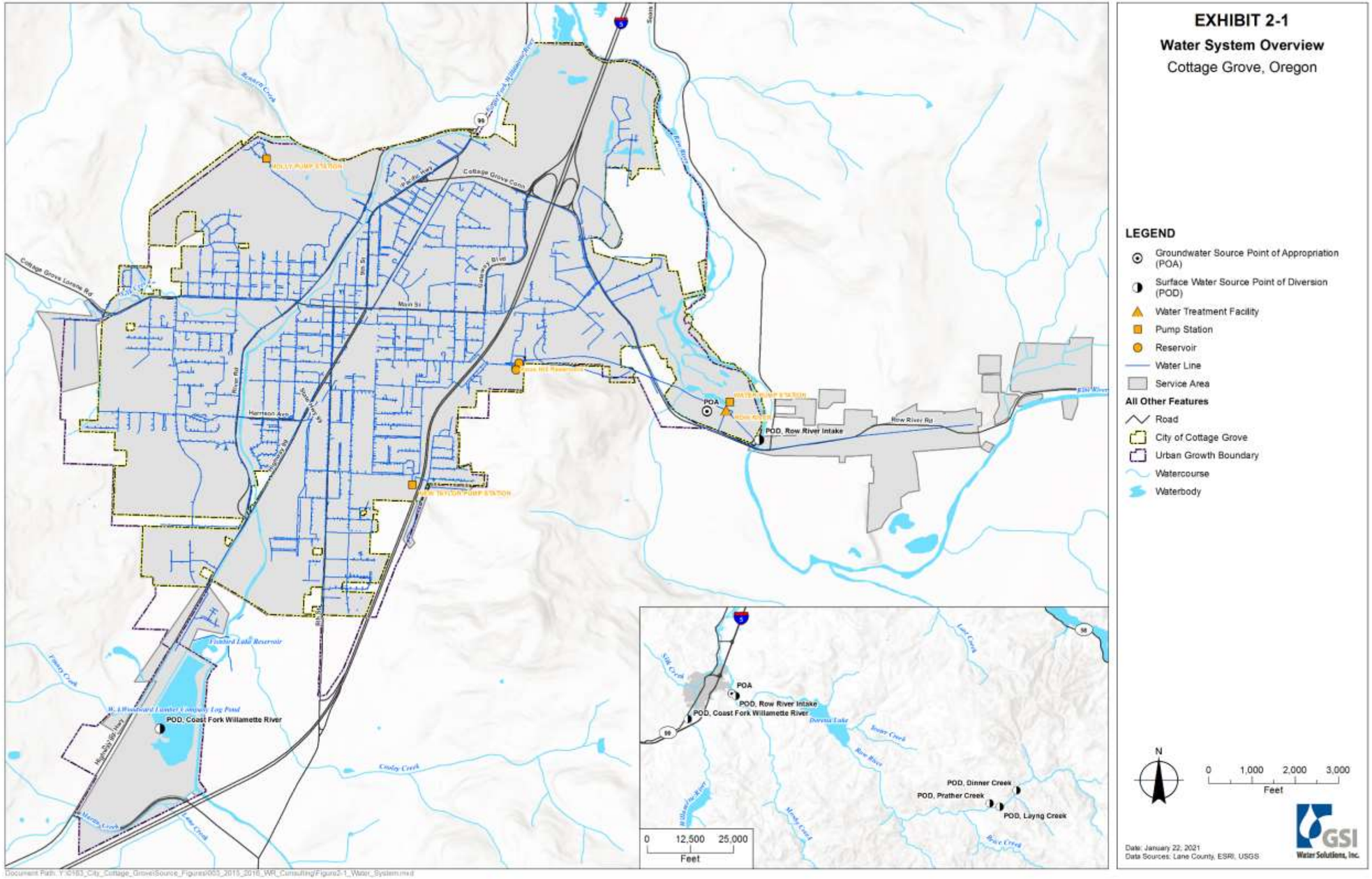
2.4 Service Area Description and Population

OAR 690-086-0140(2)

The City's current water service area is shown in Exhibit 2-1.

The City's population was estimated to be 10,758 residents within its service area in 2019. Population projections were obtained from the Portland State University's (PSU) Population Research Center's Population Forecast published in 2019 then modified to account for customers outside of City limits. (PSU's estimate only includes the population within City limits.) In order to include these "outside" residential customers, the City multiplied the estimated residents per meter for residential customers inside the City limits of 3.18 persons by the number of outside residential meters served by the City (149). Based on this methodology, the number of residential customers living outside of City limits is estimated to be 474 persons (3.18 persons per meter x 149 outside meters). Cottage Grove added PSU's population estimate of 10,284 persons within City limits to 474 persons outside City limits to arrive at the total service area population noted above.

Exhibit 2-1. Water Delivery Area Map and System Schematic



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2.5 Measuring and Reporting

The City annually submits water use records to OWRD. These reports provide water withdrawal measurements which complies with the measurement standards in OAR Chapter 690, Division 85. The City's water use records can be found on the OWRD webpage: http://apps.wrd.state.or.us/apps/wr/wateruse_report/.

The City reports withdrawal measurements for the City's following facilities and rights:

- Well (Certificate 82233),
- Row River Water Treatment Plant point of diversion (Certificates 87027, 87028, and 91536; Transfer T-10530; and Permit S-42117),
- Coast Fork Willamette River (Certificate 8035), and
- Golf course point of diversion (Certificates 87027 and 87028).

The City measures the volume of water diverted from the Row River at two intakes using one independent meter at each of the two intakes. The City does not currently divert water from the Coast Fork Willamette River. The City's well is currently not in use.

The City also measures finished water (known by the City as "WTP filtrate") leaving the WTP at one meter. This finished water is conveyed to the City's two adjacent reservoirs (4.3 Million Gallons of total storage) located within the city limits on Knox Hill for distribution to the City's customers. Water entering the reservoirs and entering the distribution system is metered as well.

2.6 Terminology

Throughout this WMCP, common water industry terms are used to describe the City of Cottage Grove's water system. These are defined below.

Water demand refers to the quantity of water diverted from the City's surface water sources to the water treatment plant (WTP).

Process water is the amount of water used at the WTP during the treatment process and is measured as the difference between water demand and finished water demand. The City uses this process water to help ensure that the WTP can treat raw water at the designed rate. The WTP is located in close proximity to the Row River and process water is returned to the river via a short drainage channel and then a marsh that are located in the City's Row River Nature Park.

Consumption refers to the portion of water use attributable to metered uses by customers and authorized unmetered uses, such as water line flushing.

This WMCP uses several types of water units to measure quantities or rates of water production, demand, or source withdrawal. Demand and consumption are expressed in units of million gallons per day (mgd), cubic feet per second (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 reported in million gallons (MG). Water use per person or per capita is expressed in gallons per person per day (gpcd).

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

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

Maximum day demand (MDD) equals the highest system demand that occurs on any single day during a calendar year (the peak day).

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.

2.7 Historical Demands

OAR 690-086-0140(4)

In the following Sections 2.7.1 through 2.7.6, the City uses measurements of water diverted from the City's surface water sources to describe annual demands, annual maximum day demands, monthly demands, per capita demands, and peaking factors.

2.7.1 Historical Water Demands

The City's annual water demand from 2011 to 2019 are presented in Exhibit 2-2. The year 2011 represents the first full year in which the City relied on the Row River exclusively to meet system demands. Prior to 2011, the City diverted water from Prather, Dinner and Layng Creeks to help meet demand; this water was conveyed in a 22-mile transmission line to the City's reservoirs. Water losses along this pipeline contributed to system demand. The City's current diversion from the Row River eliminates these losses from the original pipeline and resulted in approximately 110 former City customers to now be served by the Row River Valley Water District.

Exhibit 2-2. Water Demand, 2011-2019

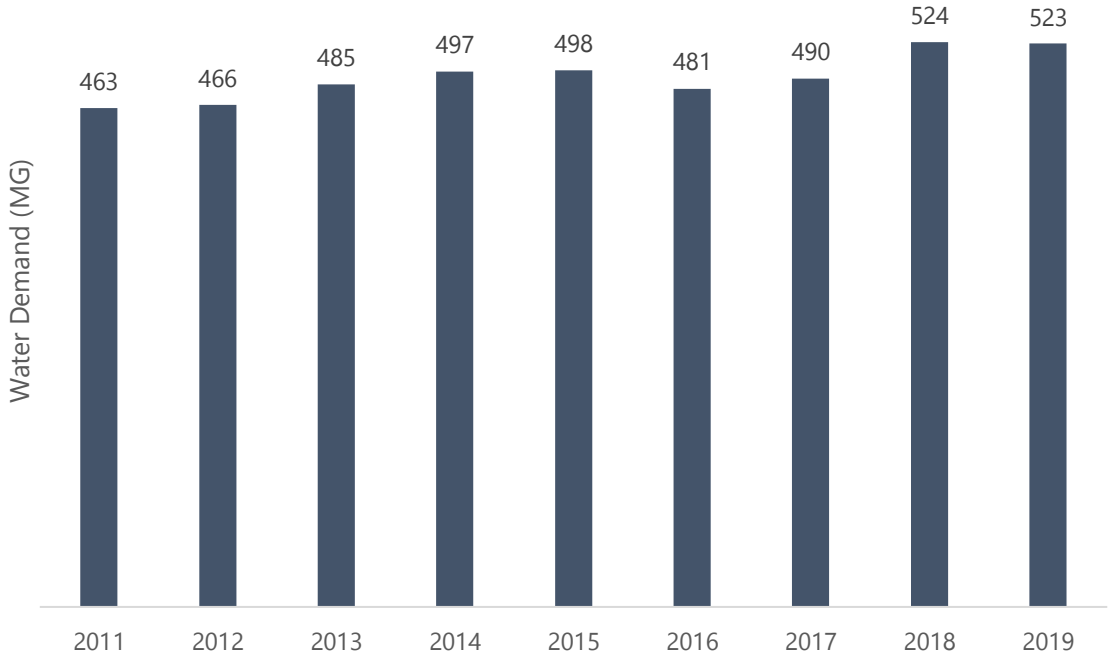
	2011	2012	2013	2014	2015	2016	2017	2018	2019
Total (MG)	463	466	485	497	498	481	490	**524**	523
Maximum Day (mgd)	2.58	2.74	**3.23**	2.92	2.85	2.80	2.92	3.05	2.80
Average Day (mgd)	1.27	1.28	1.33	1.36	1.36	1.32	1.34	**1.44**	1.43
Peaking Factor (MDD/ADD)	2.03	2.15	**2.43**	2.14	2.09	2.12	2.18	2.12	1.96

Note: Highest values are bold.

Select data from Exhibit 2-2 are depicted in the following four exhibits. Exhibit 2-3 presents the 2011 to 2019 annual water demands from Exhibit 2-2 graphically. Demands during this time

showed a steady increase, owing likely to increases in population and economic growth as the City exited the Great Recession.

Exhibit 2-3. Annual Water Demand, 2011-2019

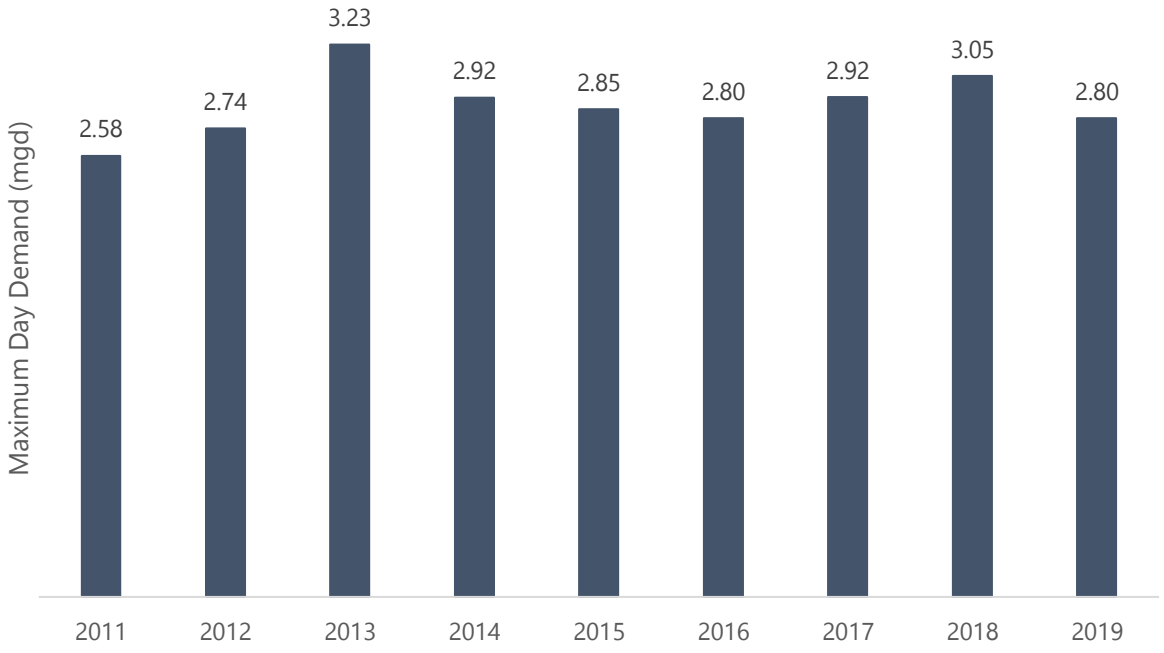


2.7.2 Maximum Day Demands

Exhibit 2-4 presents maximum day demands (MDD) from 2011 to 2019. MDD ranged from a low of 2.58 mgd (2011) to a high of 3.23 mgd (2013) during this time period. MDD occurred in July each year except for 2012 and 2018, during which MDD occurred in August. Weather and economic conditions strongly influence MDD. In particular, hot and/or dry weather can result in more outdoor irrigation, which increases MDD. The economy can affect MDD as well by influencing customers' irrigation habits, the building of new homes with landscapes that need intense irrigation for plant establishment, and the opening or closing of facilities that use water in their operations.

The City's water rights and water supply infrastructure, such as the WTP and reservoirs, must be capable of meeting MDD. Therefore, the MDD helps to define how the City manages its water supply, from infrastructure sizing to the water rates the City charges its customers.

Exhibit 2-4. Maximum Day Demands, 2011-2019



2.7.3 Peaking Factors

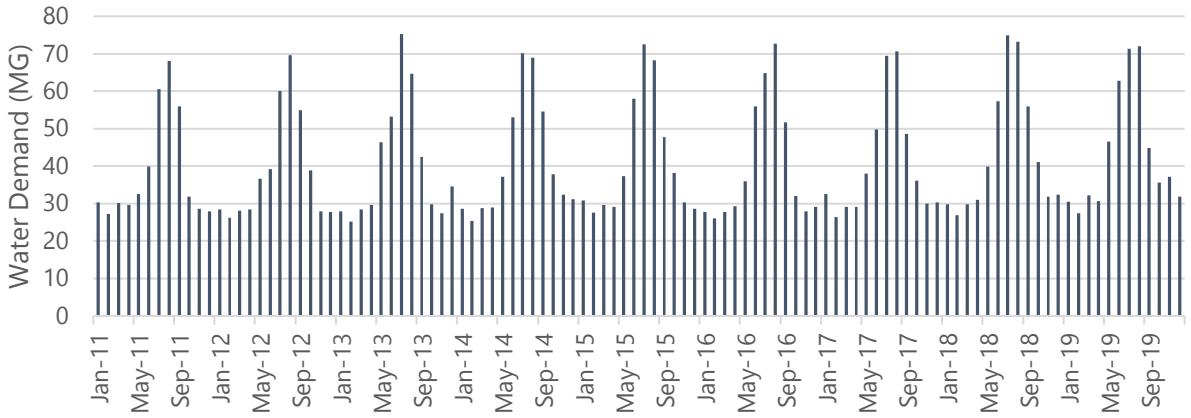
Peaking factors are the ratios of one demand value to another. The City's MDD to ADD peaking factor averaged 2.14 from 2011 through 2019, and was highest in 2013 at 2.43. The City's average peaking factor is similar to other water providers in the region, such as Eugene Water and Electric Board (EWEB), which averaged 2.11 from 2010 to 2016 (EWEB 2018 WMCP).

2.7.4 Monthly Demand

Exhibit 2-5 depicts the seasonality of the City's water demand by presenting demand on a monthly basis from 2011 to 2019. The highest readings occurred during the summer seasons.

From 2011 through 2019, the Maximum Monthly Demand (MMD) occurred four times during the months of July and five times in August, with the summer peak season generally extending from June through September each year. The highest monthly demand was 75 MG observed in July 2013.

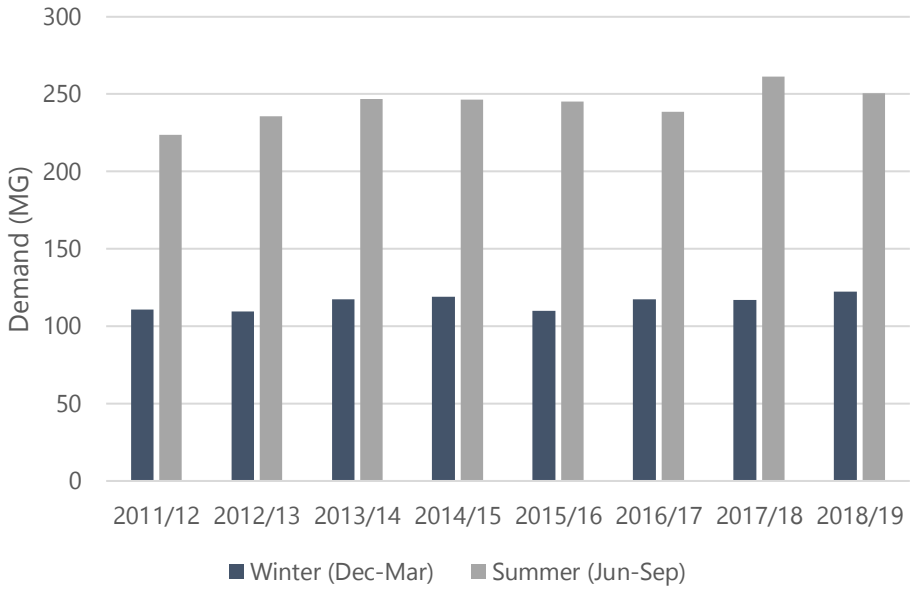
Exhibit 2-5. Monthly Raw Water Demands, 2011-2019



2.7.5 Seasonal Demand

Exhibit 2-6 presents aggregated monthly demands by season, which demonstrates the impact of weather on demand. The summer season represents the months of June through September and the winter season comprises the months of December (from the previous year) through March. The year 2010/2011 is not shown since this WMCP is only considering demand data from 2011 and beyond, when the City began relying on the Row River solely for supply. Summer seasonal demands were more than double the winter demand, showing the impact of outdoor water use and possibly seasonally-dependent business activities of the City's industrial and commercial customers.

Exhibit 2-6. Seasonal Demand, 2011/2012 - 2018/2019



2.7.6 Per Capita Demand

Exhibit 2-7 shows the per capita water use that was calculated by dividing annual MDD by the estimated population served for the corresponding year.[1] MDD per capita water use ranged from a low of 252.5 gallons per capita (gpcd) in 2011 to a high of 314.8 gpcd in 2013 (bolded in Exhibit 2-7). The MDD per capita water use factor of 314.8 gpcd is used in Section 5 to project a future demand that the City could observe within the 20 year planning period.

Exhibit 2-7. MDD Per Capita Water Use Factor, 2011-2019

	2011	2012	2013	2014	2015	2016	2017	2018	2019
Population*	10,219	10,244	10,259	10,314	10,349	10,364	10,394	10,479	10,614
Per Capita Water Use (gpcd)	252.5	267.5	**314.8**	283.1	275.4	270.1	281.3	290.7	263.9

* Population obtained from PSU's annual population estimates plus the City's outside residential customers, estimated to be 474 persons.

2.8 Customer Characteristics and Use Patterns

OAR 690-086-0140(6)

The following descriptions of the City's customers and consumption patterns draw data from billing records from 2015 through 2019. Consumption from previous years was not available due to a billing software conversion that occurred in 2014.

2.8.1 Customer Descriptions

The City's customers are divided into 15 customer classes, some of which are distinguished by the City for billing purposes based on their location inside or outside city limits. The classes are: Church, Outside Church, Commercial Inside, Commercial Outside, Industrial Inside, Industrial Outside, Parks, Medical, Residential Inside, Residential Outside, Irrigation, Municipal Irrigation, Fireline, Restaurant, and School. Both the "inside" and "outside" Residential classes include multi-family and single family residences.

Exhibit 2-8 shows that the City's total number of customer accounts was 3,893, based on the meter count in December 2017. Of these, the total number of meters outside the city limits was 162. The following exhibit, however, does not distinguish between residential and commercial customers inside and outside the city limits. In addition, the meter counts for the Parks, Municipal Irrigation, and Municipal classes were combined into one account titled "Municipal" for this WMCP. Finally, since there was no consumption identified for the Fireline class during this period, this class was intentionally omitted from Exhibit 2-8. Note that although total

[1] PSU's population estimate for 2019 performed annually for all municipalities in Oregon is slightly less than the estimate found in PSU's 2019 population forecast. The 2019 value shown in Exhibit 2-7 was obtained from PSU's annual estimate, not PSU's forecast.

numbers of meters increased slightly in 2018 and 2019, the percent of the total for each of the customer class accounts are similar to previous years.

Exhibit 2-8. Accounts by Customer Class, December 2017

	Church*	Commercial*	Industrial*	Irrigation	Medical	Municipal	Residential*	Restaurant	School	Total
Accounts	20	331	13	51	7	41	3,387	28	15	3,893
Percent of Total	0.5%	8.5%	0.3%	1.3%	0.2%	1.0%	87.0%	0.7%	0.4%	100%

*Includes accounts both inside and outside city limits.

As shown in Exhibit 2-8, the City is primarily a residential community with a few large, non-residential water users, therefore the vast majority of customer accounts (87 percent) fall in the Residential customer class.

2.8.2 Annual Consumption

Exhibit 2-9 presents annual consumption from 2015 to 2019, fluctuating between 395 MG (2015) and 443 MG (2018), averaging 412 MG. Total consumption generally increased over this period as shown by the trend line in Exhibit 2-9.

Exhibit 2-9. Annual Metered Water Consumption with Trend Line, 2015-2019

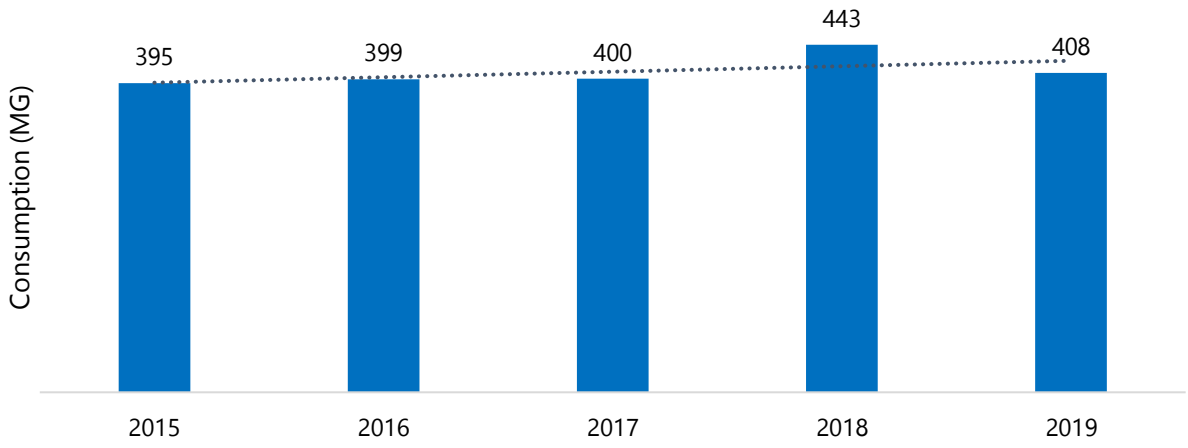


Exhibit 2-10 shows annual consumption by class, from 2015 to 2019.

Exhibit 2-10. Annual Consumption by Class (MG), 2015-2019

	2015	2016	2017	2018	2019
Church	1.9	1.6	2.1	1.8	2.3
Commercial	82.5	82.6	84.7	90.6	91.4
Industrial	7.0	6.8	9.8	8.0	12.2
Irrigation	15.0	14.2	14.6	18.4	17.4
Medical	3.0	2.9	3.4	4.5	3.8
Municipal	28.0	26.7	23.1	25.6	24.6
Residential	232.2	241.2	244.5	272.9	236.0
Restaurant	9.6	9.2	8.6	9.0	8.1
School	15.6	14.3	9.6	12.5	12.3
Total	394.8	399.5	400.4	443.3	408.1

The overall increasing trend of total consumption was largely driven by the Residential and Commercial customer classes. Exhibit 2-11 depicts the consumption values found in Exhibit 2-10, showing increases in the Residential class' consumption every year except for 2019 and annual increases in the Commercial class.

This is the City's first WMCP and therefore the City has not provided a comparison of consumption information from a previous WMCP.

Exhibit 2-11. Annual Water Use by Customer Class, 2016-2019

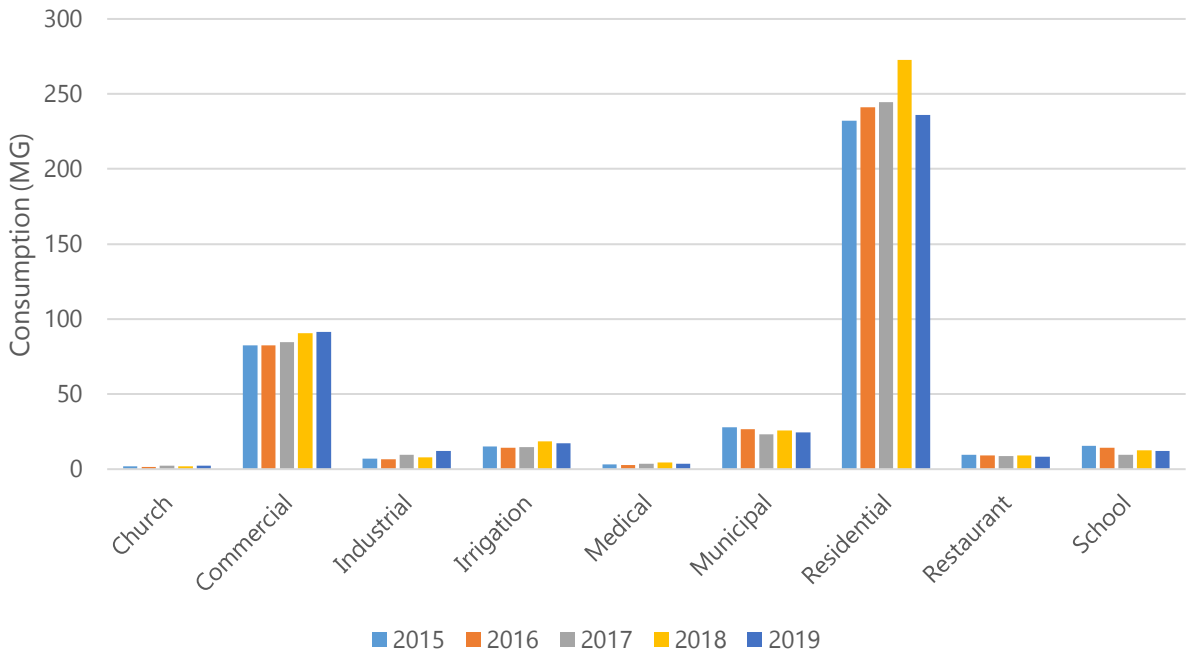
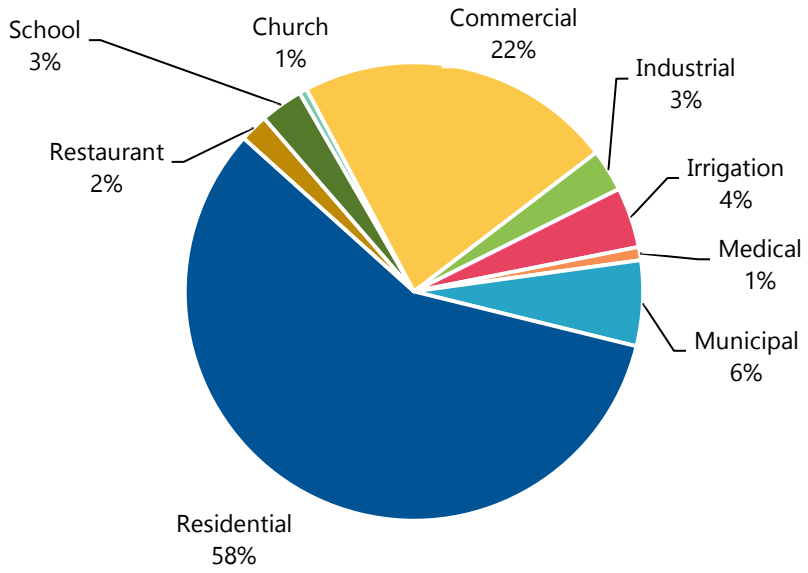


Exhibit 2-12 further describes the annual water use by customer class in 2019. As the exhibit shows, the Residential customer class consumed the most water in 2019, with a total of 58 percent of the water use. Commercial uses constituted 22 percent of total use and municipal uses represented 6 percent. The remaining customer classes each represented between 1 percent and 4 percent of total water consumption. These percentages of use by customer class are similar through the study period.

Exhibit 2-12. Percent Annual Water Use by Customer Class, 2019

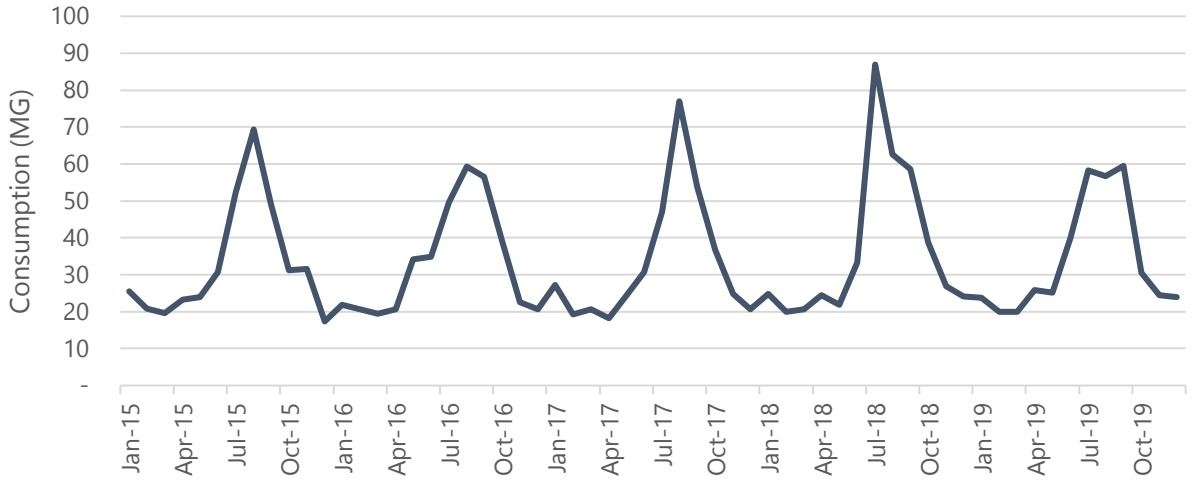


2.8.3 Monthly Consumption

Exhibit 2-13 shows monthly water use for all customer classes from 2015 through 2019, graphically depicting the seasonal fluctuations over time.

Combined, these classes showed peak use in the summer months as compared to winter months. This increase is largely attributable to outdoor irrigation in summer. The seasonal variations are further discussed below.

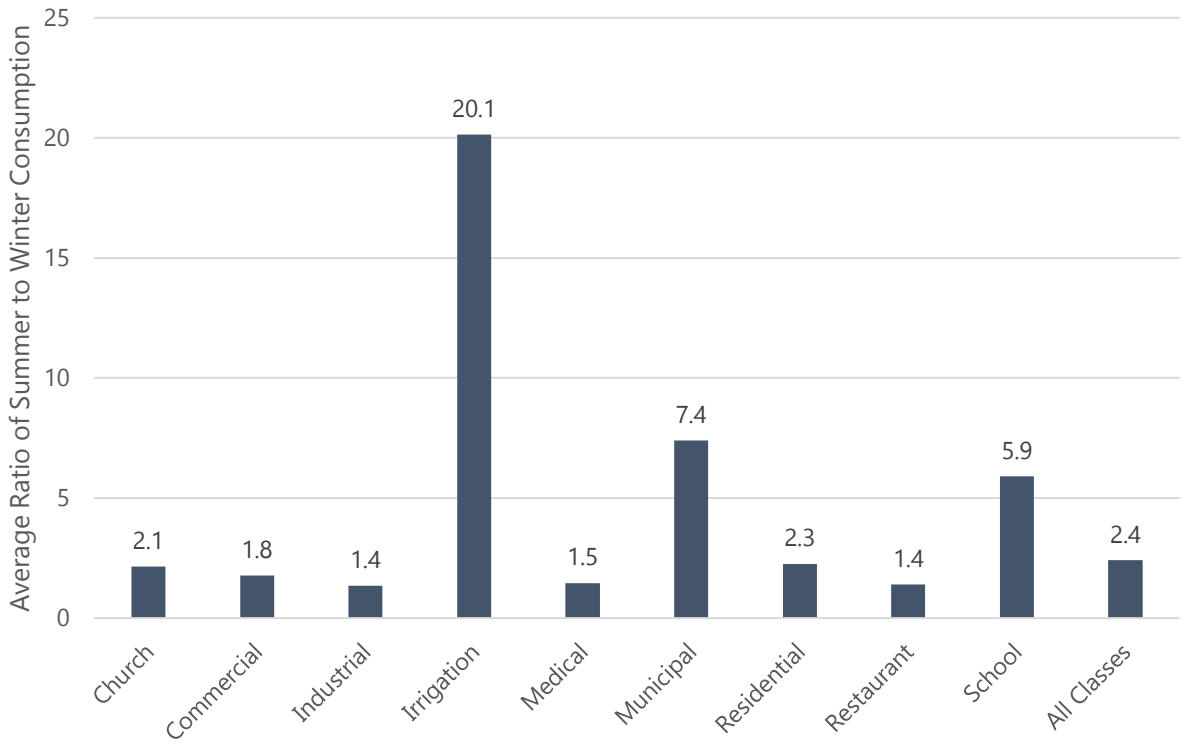
Exhibit 2-13. Monthly Metered Consumption for All Customer Classes, 2015-2019



2.8.4 Seasonal Consumption Ratios

Exhibit 2-14 shows typical seasonal consumption ratios by customer class, revealing the classes with the greatest increase in use from winter to summer seasons. These ratios are calculated by dividing the annual summer consumption by winter consumption. Summer is defined as consumption from June through September and winter is defined as December through March.

Exhibit 2-14. Typical Ratios of Seasonal Water Consumption by Customer Classes



The top three summer season to winter season ratios include the Irrigation class (20.1); the Municipal class (7.4), which includes summer irrigation of parks and other areas; and the Schools class (5.9), which includes irrigation of school grounds. While the ratios of these three classes may be large, the associated customer classes' consumption is small relative to overall consumption. For example, the Irrigation class shows a seasonal ratio of 20.1, but accounted for only 4 percent of overall consumption in 2019 as shown in Exhibit 2-11. For perspective, the average seasonal ratio for the largest customer class, the Residential class, was 2.3. The City has selected to focus part of its water conservation messaging at customers' outdoor water use and these ratios can help the City identify which customer classes could benefit from water-wise messaging.

2.8.5 Top 10 Water Users

Exhibit 2-15 presents the City's top 10 water users from 2017. These users represented 11 percent of total consumption in that year. Most of these customers fall into the City's Commercial customer class, but three were municipal users and one was in the irrigation class.

Exhibit 2-15. Largest Water Users, 2017

Customer Type	Class	Annual Consumption (MG)	Percent of Annual Consumption, All Classes (%)
Mobile Home Park	Commercial	8.96	2.1%
Industrial	Commercial	8.11	1.9%
City Park	Municipal	5.51	1.3%
City Hall/Jail/ Irrigation	Municipal	4.89	1.2%
Hotel/RV Park	Commercial	4.54	1.1%
Apartments	Commercial	3.29	0.8%
City Park	Municipal	2.99	0.7%
School Irrigation	Irrigation	2.96	0.7%
Retirement Community	Commercial	2.87	0.7%
Nursing Home	Commercial	2.77	0.7%
Top 10 Users Annual Total		**46.89**	**11.2%**
Consumption of All Customers		**400.40**	**-**

2.9 Water Loss

OAR 690-086-0140(9)

To calculate water loss (i.e. non-revenue water), the City subtracted annual volumes of water demand from annual volumes consumed by its customers, less authorized, unbilled uses. Water demand volumes were obtained at the City's master meter located at the point of diversion on the Row River. Consumption volumes were obtained from customer meter readings as reported by the City's billing system software. The calculation of water loss incorporates some unbilled, authorized uses that the City tracks, including process water generated during the water treatment process at the WTP and estimates of water used during water system flushing operations.[2] The City's water loss in 2019 was 14.5 percent and ranged from 8.2 percent in 2018 to 14.5 percent in 2015 and 2019, as shown in Exhibit 2-16. These losses are a combination of real and apparent losses.

Exhibit 2-16. Water Loss, 2015-2019

	Water Demand (MG)	Consumption (MG)	Unbilled, Authorized Uses (MG)		Water Loss (MG)	Water Loss (%)
			Process Water*	Flushing**		
2015	498.0	394.8	30.0	0.8	72.4	14.5%
2016	481.0	399.5	29.0	0.8	51.7	10.8%
2017	490.5	400.4	35.5	0.8	53.8	11.0%
2018	524.3	443.2	37.1	0.8	43.2	8.2%
2019	522.6	408.0	35.4	3.6	75.6	14.5%
Total	2,516.4	2,045.8	166.9	6.9	296.7	11.8%

* Calculated by subtracting annual finished water from annual water demand volumes.

** Estimated annual volume of water due to system flushing.

2.10 Water Rights

OAR 690-086-0140(5)

The City holds one groundwater right and nine surface water rights. The City's groundwater right, Certificate 82233, authorizes appropriation of up to 3.1 cfs for municipal use, but the well associated with this right experienced a reduction in its production capacity and is currently not in use. The nine surface water rights include one water right from the Coast Fork Willamette

[2] The City measured and recorded water volumes flushed for a period of three consecutive and typical months in 2018 and used this data to estimate annual historic use for system flushing from 2015 to 2018. In 2019, the City performed similar a measurement and calculated a greater flushing volume for that year.

River, four surface water rights from the Row River, and four water rights from tributaries of the Row River.

The City's surface water right on the Coast Fork Willamette River, Certificate 8035, allows for diversion of up to 4.5 cfs. The authorized use for this right is limited to municipal fire protection. The City does not currently divert water from the Coast Fork Willamette River under this right.

The City's eight remaining surface water rights authorize diversion from the Row River and several of its tributaries. The four rights that identify the Row River as the authorized source and are currently used to meet the City's demands are Permit S-42117 and Certificates 91536, 87027, and 87028. Permit S-42117 originally authorized diversion of up to 6.2 cfs from the Row River. In July 2016, OWRD issued a water right certificate (Certificate 91536) for a 3.1 cfs portion of the permit through a "partial perfection." The remaining 3.1 cfs portion of Permit S-42117 remains in permit status. On December 11, 2007, the City filed a permit extension application with OWRD requesting to extend the development timeline of the permit. On July 16, 2021, OWRD issued a final order approving the City's permit extension application and extending the development timeline to October 1, 2043. Certificate 87027 authorizes use of up to 0.45 cfs and Certificate 87028 authorizes the use of up to 0.36 cfs from the Row River. Originally, both of these rights authorized the use of water for irrigation. The City, however, filed Transfer T-10615 that changed the rights to allow for municipal purposes within its service area, and added points of diversion at the City's Row River intake. (Certificates 87027 and 87028 also have downstream points of diversion that allow the City to divert water for the City golf course.) These two rights have volume restrictions and are limited for use only during the irrigation season.

Three additional surface water rights, Certificates 93716, 93717 and 93718, authorize diversion from Layng, Dinner, and Prather Creeks, respectively. These creeks are tributaries of the Row River and originally provided the City with its source of water supply, but are not currently in use. In 2008, OWRD approved a transfer application (T-10530) to authorize a change in the points of diversion for the water rights from the three creeks to the City's Row River intake. In 2018, OWRD approved the City's request to partially revert Transfer T-10530. The entirely of the water rights authorizing diversion from Dinner and Prather Creeks, and a 2.67 cfs portion of the right authorizing diversion from Layng Creek were reverted back to the original points of diversion. The remaining portion of Transfer T-10530 continues to authorize the diversion of up to 3.1 cfs from Layng Creek at the City's Row River intake. The completion date for this transfer is October 1, 2023. Following the partial reversion, OWRD issued Certificate 93716, which authorizes use of up to 2.67 cfs from Layng Creek; Certificate 93717, which authorizes use of up to 4.0 cfs from Dinner Creek; and Certificate 93718, which authorizes use of up to 4.0 cfs from Prather Creek.

These rights are presented in detail in Exhibit 2-17.

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Exhibit 2-17. Water Rights Held by the City of Cottage Grove

Source	Application No.	Permit No.	Certificate No.	P.A. or Transfer No.	Priority Date	Use	Max. Instantaneous Diversions Allowed		Max. Instantaneous Diversions to Date		2019 Avg. Withdrawal Monthly / Daily (MG)	5 Year Avg. Withdrawal Monthly / Daily (MG)	Authorized Completion Date	Environmental Limitations to Water Use
							cfs	af	cfs	af				
Surface Water														
Coast Fork Willamette River	S-12015	S-8430	8035	--	4/6/1928	Municipal fire protection	4.5	N/A	4.5	N/A	0	0	N/A	Water body may be 303(d) listed for multiple parameters and may support listed fish species. See Section 2, Aquatic Resource Concerns for more information.
Layng Creek	S-136	S-30	93716 ~~2385~~	~~T-10530~~	6/12/1909	Municipal	2.67	N/A	2.67	N/A	0	0	N/A	
Dinner Creek	S-10140	S-6822	93717 ~~7787~~	~~T 10530~~	4/28/1925	Municipal	4.0	N/A	4.0	N/A	0	0	N/A	
Prather Creek	S-12142	S-8582	93718 ~~7838~~	~~T-10530~~	6/18/1928	Municipal	4.0	N/A	4.0	N/A	0	0	N/A	
Layng Creek	S-136	S-30	~~2385~~	T-10530	6/12/1909	Municipal	3.1	N/A	0	N/A	43.8/1.4	42.2/1.4	10/1/2023	
Row River	S-23335	S-18443	87027 ~~19882~~	~~T-10615~~	9/14/1948	Municipal	0.45	89.75	0.45	N/A			N/A	
Row River	S-31339	S-24696	87028 ~~28340~~	~~T-10615~~	2/1/1957	Municipal	0.36	70.75	0.36	N/A			N/A	
Row River	S-55338	S-42117	91536	--	9/22/1977	Municipal	3.1	N/A	3.1	N/A			N/A	
Row River	S-55338	S-42117	--	--	9/22/1977	Municipal	3.1	N/A	3.1	N/A			10/1/2043	

Source	Application No.	Permit No.	Certificate No.	P.A. or Transfer No.	Priority Date	Use	Max. Instantaneous Diversions Allowed		Max. Instantaneous Diversions to Date		2019 Avg. Withdrawal Monthly / Daily (MG)	5 Year Avg. Withdrawal Monthly / Daily (MG)	Authorized Completion Date	Environmental Limitations to Water Use
Ground Water														
A well	G-7813	G-7724	82233	--	9/22/1977	Municipal	3.1 cfs	N/A	3.1	N/A	0	0	N/A	None

2.11 Aquatic Resource Concerns

OAR 690-086-140(5)

OAR 690-086-140(5) requires municipal water suppliers to identify the following for each of its 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.

2.11.1 Water Quality

The City's nine water rights authorize use from five surface water sources: Coast Fork Willamette River, Layng Creek, Dinner Creek, Prather Creek, and the Row River. For Dinner and Prather Creeks, no water quality parameters were established per the 2018/2020 Integrated Report published by the Oregon Department of Environmental Quality. These creeks are tributaries of the Row River. The 303(d) listings for the Coast Fork Willamette River, Row River, and Layng Creek are listed in Exhibit 2-18.

Exhibit 2-18. 303(d) Listings of Coast Fork Willamette and Row Rivers

Parameter	Status
Coast Fork Willamette River (RM 23)	
Dissolved Oxygen- Spawning	Category 5
E. coli	Category 4A
Excess Algal Growth	Category 5
Temperature- Year Round	Category 5
Row River (RM3)	
BioCriteria	Category 5
Temperature- Spawning	Category 5
Temperature- Year Round	Category 5
Turbidity	Category 5
Layng Creek	
Temperature- Year Round	Category 5

Notes

The 303(d) listing information was obtained from: https://travispritchard.shinyapps.io/2018-2020_IR_Database/

2.11.2 Listed Streamflow-dependent Species

Exhibit 2-19 shows the listed fish species found in the Upper Willamette River Basin which includes the Row and Coast Fork Willamette Rivers. The City's PODs are located at approximately Row River Mile (RM) 3 and Coast Fork Willamette RM 23.

Exhibit 2-19. Listed Fish Species

Species	Evolutionarily Significant Unit (ESU)	Federal Listing	State Listing
Bull Trout	Willamette SMU	--	Sensitive
Chinook Salmon	Mid-Columbia River SMU	Threatened	Sensitive (Fall)
Chinook Salmon	Lower Columbia River MSU/ESU	Threatened	Sensitive-Critical (Spring)
Chinook Salmon	Willamette/Upper Willamette River	Threatened	Sensitive-Critical (Spring)
Coastal Cutthroat Trout	Lower Columbia River, including up to Willamette Falls; Columbia River ESU	--	Sensitive
Coho Salmon	Lower Columbia River, including up to Willamette Falls	Threatened	--
Oregon Chub	--	Threatened	Sensitive-Critical
Steelhead (Stealhead-Summer/Coastal Rainbow Trout for state)	Upper Willamette River; Lower Columbia River	Threatened	Sensitive-Critical
Steelhead-Winter/Coastal Rainbow Trout	Willamette SMU, Upper Willamette River ESU, Lower Columbia SMU/ESU	--	Willamette SMU, Upper Willamette River ESU-Sensitive; Lower Columbia SMU/ESU, Sensitive-Critical
Chum Salmon	Columbia River	Threatened	Sensitive-Critical
Chum Salmon	Lower Columbia SMU/Columbia River ESU	--	Sensitive-Critical
Western Brook Lamprey	Range-wide	--	Sensitive

Sources:

Federal ESA listed species (threatened and endangered), from National Oceanic and Atmospheric Administration (NOAA) Fisheries Office of Protected Resources: http://www.nmfs.noaa.gov/pr/species/esa/fish.htm

Federal Sensitive species, from the Interagency Special Status/Sensitive Species Program for Oregon and Washington State: http://www.fs.fed.us/r6/sfpnw/issssp/agency-policy/

Oregon State ESA listed species, from the Oregon Department of Fish and Wildlife: http://www.dfw.state.or.us/wildlife/diversity/species/threatened_endangered_candidate_list.asp

Oregon State Sensitive Species, from the Oregon Department of Fish and Wildlife: http://www.dfw.state.or.us/wildlife/diversity/species/sensitive_species.asp

Federal Species of Concern, from the U.S. Fish and Wildlife Service, Oregon Fish and Wildlife Office: http://www.fws.gov/oregonfwo/Species/Data/PacificLamprey/default.asp

2.11.3 Critical Groundwater Area

The City's groundwater right (Certificate 82233) is not located in a Critical Groundwater Area.

2.12 Evaluation of Water Rights/Supply

OAR 690-086-0140(3)

The City holds one groundwater right, Certificate 82233, which authorizes appropriation at a rate up to 3.1 cfs. The City does not currently use groundwater under this right to meet demand due to the associated well's low productivity. The City may re-evaluate the use of this groundwater right as a source of future backup supply.

Certificate 8035 authorizes diversion of water from the Coast Fork Willamette River for municipal fire protection. The City does not currently divert water under this water right.

Combined, the City's surface water rights for the Row River and Layng, Dinner, Prather Creeks authorize a maximum instantaneous diversion rate of 20.78 cfs (13.41 mgd). The amount of water available to the City under these water rights is affected by streamflows, relative priority of water rights, and limitations associated with these rights.

Certificate 91536 (3.1 cfs) and Permit S-42117 (3.1 cfs) are junior in priority to an instream right on the Row River evidenced by Certificate 59763, which protects up to 40 cfs instream year-round to support aquatic life. Information from the US Geological Survey (USGS) gage 14155500 located on the Row River near Cottage Grove, however, indicates that the instream right is typically met. When OWRD issued a final order approving the extension of time for Permit S-42117, it conditioned the use of water under the permit to maintain the persistence of listed fish species in the Row River. These conditions are expected to impact the reliability of the City's permit. Thus, the City considers Certificate 91536 to be relatively reliable, but considers Permit S-42117 to provide a less reliable source of supply.

Certificates 87027 and 87028 have priority dates of September 14, 1948 and February 1, 1957, respectively. These rights are senior in priority to the instream water rights on the Row River. Use of water under these certificates, which originally authorized use for irrigation, is limited to the irrigation season (March 1 through October 31). Additionally, Certificates 87027 and 87028 have maximum volume limitations of 29.2 MG (89.75 acre-feet) and 23 MG (70.75 acre-feet), respectively. Although the season of use for Certificates 87027 and 87028 spans the City's typical four-month peak season, the volume limitations on these water

rights could preclude use late in the season. Thus, the City does not consider Certificates 87027 and 87028 to be reliable throughout the City's peak season.

Three water rights evidenced by Certificates 93716, 93717, and 93718 authorize diversion at a combined maximum authorized rate of up to 10.67 cfs from Layng, Dinner, and Prather Creeks, respectively. The City does not currently divert water under these water rights to meet its water supply needs. The full amount of water authorized under these water rights is typically not available from the authorized sources during the peak season of City water demand.

Under Transfer T-10530, the City is authorized to divert up to 3.1 cfs from the Layng Creek source at its Row River intake. The rate of water available to the City under T-10530 is dependent on streamflow at the City's original point of diversion on Layng Creek. The flows from Layng and Dinner Creeks are estimated to average 11.6 cfs (7.5 mgd), but may be as low at 4.31 cfs (2.8 mgd). (These estimates are based on miscellaneous measurements taken between mid-July and Mid-October from 1995 through 2007 by OWRD staff on Layng Creek below the confluence with Dinner Creek but above the confluence with Prather Creek.) Based on these measurements and the lack of other water rights on Layng Creek, the City considers the 3.1 cfs under Transfer T-10530 to be a reliable source of supply.

2.13 System Description

OAR 690-086-140(8)

Exhibit 2-1 presents a schematic of the City's water system.

The City's source of supply is from the Row River. Water diverted from the Row River is transmitted to the City's WTP, which is located about one mile east of city limits. The WTP currently has a capacity of 6.0 mgd.

Following treatment, one 18 inch main transports treated water to the City's two primary adjacent reservoirs on Knox Hill for distribution to meet system demand. One of these reservoir's capacity is 2.3 MG and was constructed in 1954 and the City's other reservoir's capacity is 2.0 MG and was constructed in 1993 for a total available storage capacity of 4.3 MG.

The City's only well is located adjacent to the WTP and is currently not used. No infrastructure currently exists to divert water from the Coast Fork Willamette River.

Cottage Grove donated the Layng Creek WTP and associated infrastructure to the Row River Valley Water District in 2009 and no longer directly diverts water from Layng, Dinner, and Prather Creeks.

3. Water Management and Conservation

This section addresses the requirements of OAR 690-086-0150(1) – (6).

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

3.1 Progress Report and Current Conservation Measures

OAR 690-086-0150(1) and (3)

This is the City's first WMCP, so providing a progress report on water conservation measures in this WMCP is not applicable.

The City currently implements a variety of water conservation measures. These water conservation measures are detailed throughout Section 3.

3.2 Use and Reporting Program

OAR 690-086-0150(2)

As noted in Section 2.5, the City's water measurement and reporting program complies with the measurement standards in OAR Chapter 690, Division 85. The City's water use records can be found at http://apps.wrd.state.or.us/apps/wr/wateruse_report/.

The production data annually submitted by the City to OWRD per the OAR 690-085 is calculated through the use of flow meters located at the points of diversions. The Row River raw water diversion volumes authorized by Transfer T-10530, Certificates 87027, 87928, and 91536, and Permit S-42117 are recorded monthly by calculating the difference between one month's reading and the next. Raw water diversion volumes authorized by Certificates 87027 and 87028 (golf course) are calculated based on pumping rate and duration of pumping duration for each month.

3.3 Required Conservation Programs

OAR 690-086-0150(4)

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

1. Annual water audit
2. System-wide metering
3. Meter testing and maintenance
4. Unit-based billing
5. Water Loss Analysis

6. Public education

During the next 5 years, the City plans to initiate, continue, or expand these required conservation measures as described below and summarized in Exhibit 3-1.

3.3.1 Annual Water Audit

OAR 690-086-0150(4)(a)

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 to identify leaks in the system, and authorized and unauthorized water uses, either metered or estimated. The water audit also includes an analysis of the water supplier's own water use.

The City conducts annual water audits. The City calculates its annual water loss as the difference between the water demand and the metered water consumption, less unbilled, authorized consumption. Data for this calculation comes from the City's master meter (demand) and customer meter readings (consumption) are obtained from the City's billing system software. Unbilled, authorized consumption includes process water, which is metered by the City, and water used during the City's system flushing operations, which is estimated.

As described in Section 2.7, the City's average water loss from 2015-2019 was estimated to be 11.8 percent.

Five-Year Benchmarks: The City will continue to conduct annual water audits.

3.3.2 System-wide Metering

OAR 690-086-0150(4)(b)

The City's water system is fully metered and all new customers' water connections are fitted with meters. The City is currently conducting a study to evaluate the feasibility of installing automated meter reading (AMR) meters throughout the system. One of the conservation benefits associated with AMR meters is an opportunity to quickly identify leaks.

Five-Year Benchmarks: The City will continue to require meters on all new connections. In the next two years, the City will evaluate whether to install AMR meters.

3.3.3 Meter Testing and Maintenance

OAR 690-086-0150(4)(c)

The City has an active meter testing and maintenance program. The City's 14 largest customer meters are tested annually and repaired or replaced as needed. Large meters that are repaired are calibrated to the manufacture's specifications. For customers' meters smaller than three inches, the City tests these meters at the request of its customers and repairs or replaces these meters as needed. All meters that are repaired are calibrated to the manufacture's specifications.

In 2019, the City initiated a campaign to replace all customers' meters with meters fitted with Advanced Meter Infrastructure (AMI) technology. This meter replacement campaign will be completed in February 2021. AMI allows for better accuracy of water use and detection of leaks within minutes. Accuracy is improved as AMI significantly reduces the potential for human error during the meter reading process. Leak detection can be nearly instantaneous due to the near real-time meter monitoring capabilities of the AMI software. This software will generate water leak alerts immediately upon detection, enabling the City to respond to leaks within a couple days and thereby reducing water loss. Previously, the City was not alerted to possible leaks for up to two months. In the near future, the City intends to purchase add-on software that will allow customers to view their account and track their water usage in real time. This new software also will allow the City to more easily communicate electronically with customers through instant messaging, emails, and alerts via a mobile device application.

Within the last seven years, the City tested the master meter located immediately downstream of the City's reservoirs on Knox Hill. This meter represents the beginning of the City's distribution system. The City currently tests its master meters measuring production at the points of diversions on the Row River and at the WTP infrequently and not on a set schedule.

Five-Year Benchmarks: The City will maintain its testing and maintenance program for customers' meters. The City will begin testing its master meters located at the Row River points of diversions, at the WTP, and downstream of the Knox Hill reservoirs every two years. All meters will be brought into manufacturers' specifications following testing, as needed.

3.3.4 Water Rate Structure

OAR 690-086-0150(4)(d)

The City has a monthly service rate based on meter size plus a monthly commodity rate based on the quantity of water metered at the service connections. Customers inside city limits are charged a different commodity rate than those outside city limits.

The commodity rate for the residential class has a progressive three-tiered pricing structure. The tiers' ranges are 0 to 5,999 gallons (Tier 1), 6,000 gallons to 15,000 gallons (Tier 2), and over 15,000 gallons (Tier 3). Each tier's water commodity rate is higher than the previous tier. This progressive pricing structure is intended to encourage efficient use of water. The City's other customer classes are also charged based on the quantity of water used though these classes have only one tier. Residential and non-residential customer rates for fiscal year 2020-2021 are found in Appendix B.

Five-Year Benchmarks: The City will continue to bill customers based, in part, on the quantity of water metered at the service connection.

3.3.5 Water Loss Analysis

OAR 690-086-0150(4)(e)

This rule requires that a municipal water provider must compare their water loss estimates as calculated through their annual water audit to an established water loss threshold of 10 percent. The City's average water loss was 11.8 percent from 2015 through 2019, thus the City must provide a description and analysis identifying potential factors for the loss and selected actions for remedy within two years of issuance of a final order by OWRD for this WMCP. If, after five years, water losses are greater than 10 percent, the City 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.

In order to reduce water losses, the City has instituted a regularly scheduled and systematic leak detection and repair program that includes five components. First, the City regularly conducts visual monitoring of water system infrastructure for signs of leaks. Second, the City uses SCADA to monitor water treatment plant production, transmission line water conveyance, reservoir levels, and select large customer meter readings for abnormalities that could indicate leaks.

Third, the City's staff conducts leak detection surveys on approximately 15 percent of the distribution system per year using an acoustic leak detection monitoring device. Upon detection of a leak, the City records the leak on a list and prioritizes the list based on the volume of each leak. Large leaks are repaired immediately and smaller leaks are repaired in a timely manner according to priority. The City historically has not performed regular leak detection on its water transmission system, which is the piping infrastructure from the Row River to the WTP, and from the WTP to the Knox Hill Reservoirs. However, the City will begin performing leak detection surveys on its transmission lines as a means to identify leaks and further reduce its water losses.

Fourth, customers also help the City detect leaks. When the City receives a call from a customer about a suspected leak, the City sends staff to investigate. The investigation includes a check of the meter for proper functioning. If the meter is functioning properly, City staff look for potential sources of leaks in the customer's line.

Fifth, due to the installation of AMI technologies on all customer meters, the City can now receive automatic alerts to potential leaks immediately upon detection by the AMI software, allowing the City to respond to and repair leaks within days. Under the previous system, leaks may not have been detected for up to two months. This and other benefits of AMI metering are discussed in Section 3.3.3.

Five-Year Benchmarks: The City will continue its distribution system leak detection and repair program. Within two years of approval of the water management and conservation plan, the City shall provide a description and analysis identifying potential factors for the loss and selected actions for remedy. If, after five years, water loss remains over 10 percent, the

City will develop and implement a water loss control program as required per OAR 690-086-150(4)(e)(B)(i).

3.3.6 Public Education

OAR 690-086-0150(4)(f)

The City's public education program currently includes distribution of conservation materials at its booth during the annual Party in the Park. The City recognizes that encouraging water conservation is an important element of proper water management, and plans to expand its public education program in order to reach more of its customers and reduce water waste. The City plans to target residential customers with conservation information. Residential customers consumed the most water of all customer classes and are responsible for a majority of peak season demands as noted in Section 2. Consequently, water conservation outreach to these customers may yield significant water savings. The City will focus most of its public education content on reducing residential peak season use by promoting efficient outdoor water use. The City will attempt to time the outreach such that it reaches as many customers as possible immediately prior to peak season in order to have the largest impact on demand.

The City will implement the following measures over the next five years:

- Include a bill stuffer annually highlighting low-water use landscaping techniques.
- Add a web page to the City's website describing methods to achieve efficient indoor and outdoor water use.
- Add text to the City's annual Consumer Confidence Report (CCR) noting ways customers can use water wisely.
- Once annually provide water conservation advice during the City Manager's regular radio address.
- Request that the local high school tech class creates a video promoting water conservation and seek to air the video on the City's public television station.
- Develop or purchase brochures or flyers for distribution at City events and make these available at City Hall.

Five-Year Benchmarks: In the next five years, the City will establish a mixed-media water education campaign that includes: an annual bill stuffer, an annual radio broadcast, a new web page, written materials to distribute at one City event annually, and an article in the City's annual CCR. The City will also approach the local high school's tech class requesting the students develop a water conservation video to display on the local public television station.

3.4 Additional Conservation Measures

OAR 690-086-0150(5)

OAR 690-086-0150(6) requires municipal water suppliers that serve a population greater than 1,000 and propose to expand or initiate the diversion of water under an extended permit for which resource issues have been identified, or if the population served is greater than 7,500, to provide a description of the specific activities, along with a five-year schedule to implement several additional conservation measures. Due to the City's population size and its request to expand diversion of water under extended Permit S-42117 from the Row River for which resource issues have been identified, this requirement applies to the City. The benchmarks are described below and summarized in Exhibit 3-1.

3.4.1 Technical and Financial Assistance Programs

OAR 690-086-0150(5)(a)

The City provides technical information and financial assistance that promote water conservation to its customers. The City provides technical information to customers during face-to-face discussions at the Party in the Park event where the City hosts a booth. The City also provides leak detection and repair information to customers when investigating suspected leaks or other water loss situations at customers' residences or businesses. For example, the City currently is working with its largest customer, Weyerhaeuser, to identify potential water loss on the company's property that may be due to abandoned water lines.

As an additional method of providing technical information, the City will begin distributing flyers that discuss ways to conserve water outdoors and will make leak repair kits available. These items will be available at the City's Party in the Park and at City Hall.

Five-Year Benchmarks: The City will continue to provide technical and financial assistance to customers by tracing leaks on customers' properties upon request and providing information about leaks during customer interactions. In the next two years, the City will make water conservation flyers and leak detection kits available to customers at a minimum of one City event and at City Hall.

3.4.2 Supplier Financed Retrofit or Replacement of Inefficient Fixtures

OAR 690-086-0150(5)(b)

The City currently does not help finance the retrofit or replacement of inefficient fixtures.

Five-Year Benchmarks: In the next two years, the City will make free low-flow showerheads and faucet aerators available to customers at one or more City events and at City Hall.

3.4.3 Rate Structure and Billing Practices that Encourage Conservation

OAR 690-086-0150(5)(c)

As described under 3.3.4, the City has a basic service rate based on meter size plus a monthly progressive commodity rate based on the quantity of water metered at the service connection. The commodity rate for the residential customer class has three tiers to encourage water conservation. In addition, the City plans to include one billing insert each year prior to the summer that promotes outdoor water conservation. The City bills its customers monthly, a beneficial practice that provides customers feedback of water consumption quickly and enables customers to adjust consumption practices accordingly.

Five-Year Benchmarks: The City will continue to bill customers based, in part, on the quantity of water metered at the service connection. In the next two years, the City will add a billing insert annually that promotes outdoor water conservation prior to peak season.

3.4.4 Water Reuse, Recycling, and Non-potable Water Opportunities

OAR 690-086-0150(5)(d)

The City has a successful water re-use program and has plans to expand the program. The program currently consists of distributing treated effluent from the City's wastewater treatment plant to a local golf course for irrigation purposes. The volume of wastewater used at the golf course represents 60 percent to 80 percent of the treated effluent during the irrigation season.

The City is constructing a 29 acre-foot storage facility to hold treated effluent for irrigation use, which would allow an increase in the amount of treated effluent available for irrigation at other sites. With construction of this reservoir, the City intends to provide treated effluent to several city parks for irrigation purposes. (Future plans call for the provision of treated effluent to irrigate local schools, as well. However, the City has not begun to plan for additional infrastructure capacity necessary to supply these schools.) The projected volume of treated effluent used annually for irrigation is estimated to be 15 million gallons from May 1 through September 30.

Five-Year Benchmarks: In the next five years, The City will continue its efforts to increase use of treated effluent for irrigation purposes at city parks following completion of infrastructure upgrades at the City's wastewater treatment plant.

3.4.5 Other Conservation Measures

OAR 690-086-0150(5)(e) and -150(3)

The City recognizes that it needs to allocate funds to support its water conservation efforts as described above, and therefore, recently decided that it will set aside funds for the development and implementation of conservation measures discussed herein that are currently not funded.

Five-Year Benchmark: The City will begin to set aside financial resources to fully fund its conservation program measures starting in Fiscal Year 2020-2021.

3.5 Summary of Conservation Benchmarks

The City's benchmarks described in Sections 3.3 and 3.4 are summarized in Exhibit 3-1.

Exhibit 3-1: Summary of Benchmarks

Conservation Measures	Five-Year Benchmarks
Annual Water Audit	The City will continue to conduct annual water audits
System-wide Metering	The City will continue to require meters on all new connections.
	In the next two years, the City will decide whether to install AMR meters.
Meter Testing and Maintenance	The City will maintain its testing and maintenance program for customers' meters. The City will begin testing its master meters located at the point of diversion, at the WTP, and downstream of the Knox Hill reservoirs every two years. All meters will be brought into manufacturers' specifications following testing, as needed.
Water Rate Structure and Billing Practices that Encourage Conservation	The City will continue to bill customers based, in part, on the quantity of water metered at the service connection. In the next two years, the City will add a billing insert that promotes outdoor water conservation prior to peak season.
Water Loss Analysis	The City will continue its distribution system leak detection and repair program.
	Within two years of approval of the water management and conservation plan, the City shall provide a description and analysis identifying potential factors for the loss and selected actions for remedy.
	If, after five years, water loss remains over 10 percent, the City will develop and implement a water loss control program as required per OAR 690-086-150(4)(e)(B)(i).
Public Education	In the next five years, the City will establish a mixed-media water education campaign that includes: an annual bill stuffer, an annual radio broadcast, a new web page, written materials to distribute at one or more City event annually, and an article in the City's annual CCR. The City will also approach the local high school's tech class requesting the students develop a water conservation video to display on the local public television station.
Technical and Financial Assistance Programs	The City will continue to provide technical and financial assistance to customers by tracing leaks on customers' properties upon request and providing information about leaks during customer interactions. In the next two years, the City will make water conservation flyers and leak detection kits available to customers at a minimum of one City event and at City Hall.
Supplier Financed Retrofit or Replacement of Inefficient Fixtures	In the next two years, the City will make free low-flow showerheads and faucet aerators available to customers at a minimum of one City event and at City Hall.

Rate Structure and Billing Practices	The City will continue to bill customers based, in part, on the quantity of water metered at the service connection. In the next two years, the City will add a billing insert annually that promotes outdoor water conservation prior to peak season.
Water Reuse, Recycling, and Nonpotable Opportunities	In the next five years, The City will continue its efforts to increase use of treated effluent for irrigation purposes at city parks following completion of infrastructure upgrades at the City's wastewater treatment plant.
Other Conservation Measures	The City will begin to set aside financial resources to fund its conservation program measures starting in Fiscal Year 2020-2021.

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4. Municipal Water Curtailment

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

The City's water curtailment plan outlines measures that the City may take to meet demand during water supply shortages. The intent of water curtailment plans is to help maintain delivery by employing curtailment measures. The shortages may result from incidents such as mechanical or electrical equipment failure in the system, catastrophic events (flooding, landslides, earthquakes, and contamination), events not under control of the water supplier (e.g., localized or area-wide power outages and intentional malevolent acts), or prolonged drought.

The City has a curtailment plan which was codified in 2001 in Section 13.05 of the City's municipal code. The curtailment plan included in this WMCP is based on the plan described in the municipal code, with modifications to meet OAR 690-086-0160 and to improve components of the codified plan.

4.2 History of Supply Deficiencies and Assessment of Options

OAR-690-086-0160(1)

The City did not experience an event or other circumstances within the last ten years that warranted enactment of its curtailment plan. The City experienced its last potential water shortage in 2001. That event was due to drought which was brought on by below normal precipitation during the previous twelve months. The low precipitation resulted in the City observing the lowest water levels in the Dinner, Prather, and Layng Creeks since 1972. (These creeks were the City's primary water sources at that time.) In response, the City developed its curtailment plan, though the water shortage was not severe enough to require the City to enact the plan.

The City's ability to respond in the future to circumstances that negatively impact one or more key components of the City's water system and/or supply depends on the duration, severity, cause, and location of impact, among other factors. The City has assessed its ability to respond to events most likely to occur and those that are most likely to impinge upon the City's ability to meet demand. These events include: a supply shortage due to a prolonged drought, source contamination, WTP failure or partial shut-down, or reservoir, transmission line or distribution line damage due to an earthquake or operational issues leading to WTP malfunction. In general, events with short-term impacts to the City's WTP or source water supply might be met by relying on stored water. The City's reservoirs have a capacity of 4.3 MG. Relative to the City's

current average ADD of 1.3 mgd, the City could rely on storage alone for several days outside of peak season. The City is also in the planning stages for construction of a new reservoir, adding to its current storage capacity and providing multiple storage locations in case of an issue with one reservoir.

For minor and localized damage to the City's water distribution system caused by an earthquake, the City has the ability to transport water to many areas of the City using multiple routes because the City installed large diameter loops throughout parts of the system. These distribution system loops should help the City circumvent some sections of the distribution system that may be damaged due to earthquake or other catastrophic natural event.

Longer-term events, such as a drought or source contamination or events which cause significant damage to water system infrastructure, such as an earthquake, would compromise the City's ability to meet demand. The City has one municipal water supply point of diversion on the Row River (source is Row River and Layng Creek), and does not have any interconnections with other water providers that are capable of supplying water to the City. Any of these events could cause the City to enact the latter stages of its curtailment plan and seek water from other sources, such as water transported by tanker trucks to the City.

4.3 Curtailment Event Triggers and Stages

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

The City has adopted a three-stage curtailment plan to be invoked in the event of a water supply shortage or water service difficulties. These stages could be initiated and implemented in progressive steps or a later stage could be implemented directly. The plan includes both voluntary and mandatory measures, depending upon the cause, severity, location, and anticipated duration of the shortage. Exhibit 4-1 presents the three curtailment stages, as well as their initiating conditions (i.e. triggers).

The decision to implement curtailment will also consider the knowledge and judgment of staff familiar with the water system. Staff may evaluate system damage or contamination, duration of repair, costs, fire hazards, and weather forecasts.

Exhibit 4-1. Curtailment Stages 1 through 3

Curtailment Stages	Potential Initiating Conditions*
Stage 1: Water Shortage Advisory	Reduction in supply, treatment, or distribution system capacity (including storage) resulting in a capacity that is 91 - 99 percent of demand and is anticipated to last longer than one day.
Stage 2: Water Warning	Reduction in supply, treatment, or distribution system capacity (including storage) resulting in a capacity that is 80 - 90 percent of demand.
Stage 3: Critical Water Emergency	Reduction in supply, treatment, or distribution system capacity (including storage) resulting in a capacity that is less than 80 percent of demand.

4.4 Authority, Penalties, and Enforcement

The City Manager has the authority to activate the water curtailment plan and enforce the plan's provisions.

4.5 Communication

The City Manager or his/her designee shall provide public notification of each stage of alert by newspaper, radio, TV and/or leaflets distributed door-to-door or posted in public buildings and businesses. Notice may also be provided via the City's web page, and, if practical, as an attachment to the municipal utility bill mailed to each customer. The notice shall include the effective date and time of the restriction, a description of the restricted uses and, if known, the duration of the restricted use period.

4.6 Curtailment Plan Implementation

OAR-690-086-0160(4)

4.6.1 Stage 1: Water Shortage Advisory

Stage 1 is primarily used as a means to alert the public that there is a potential water supply problem. While the supply problem may not yet warrant mandatory water conservation, voluntary conservation by the water users is recommended to reduce the water demand and lessen, or possibly eliminate, the imposition of more advanced curtailment stage levels.

All Municipal Water Users

The City will take the actions described below to reduce water use:

- Stop hydrant flushing program.
- Reduce irrigation system water use at City parks and City facilities.

- Other measures deemed appropriate by the City.

The City will provide notices to the public requesting that all customers voluntarily reduce indoor and outdoor water uses, such as the following:

- Sprinkling, watering or irrigating shrubbery, trees, lawns, grass, ground covers, plants, vines, gardens, vegetables, flowers and any other vegetation;
- Washing automobiles, trucks, trailers, trailer houses, motorbikes, boats, and any other type of mobile equipment;
- Washing sidewalks, driveways, parking lots, tennis courts, filling station aprons, porches and other hard surface area; and
- Washing the outside of dwellings, and office buildings.

4.6.2 Stage 2: Water Warning

Stage 2 is the first level at which the City will enact mandatory water curtailment requirements limiting non-essential water use. Stage 2 actions are described below.

Irrigation Using Potable Water, All Customers

No person or customer shall sprinkle, water, or irrigate any shrubbery, trees, lawns, grass, ground covers, plants, vines, gardens, flowers or any other vegetation, with potable water except as follows:

- Between the hours of 9:00 p.m. and 6:00 a.m. and by even-numbered property addresses on even-numbered days of the calendar and by odd-numbered property addresses on odd-numbered days of the calendar.

Residential Customers The following residential water uses shall be prohibited during water warning conditions:

- The use of water to wash any motorbike, motor vehicle, boat, trailer, airplane, recreational vehicle or other vehicle except at a commercial fixed washing facility that recycles its wash water.
- The use of water to wash down any sidewalks, walkways, driveways, parking lots, tennis courts or other hard surfaced area or building or structure.
- The use of water to fill, refill or add to any indoor or outdoor swimming pools, jacuzzi pools except for neighborhood fire control, pools that have recycling water systems and evaporative covers, or if the use of the pool is required by a medical doctor's prescription.
- The use of water in a fountain or pond for aesthetic or scenic purposes except where necessary to support fish life.
- Other restrictions deemed appropriate by the City.

Non-Residential Customers The following water uses shall be prohibited during water warning conditions:

- The use of water to wash any motorbike, motor vehicle, boat, trailer, airplane, recreational vehicle or other vehicle except at a commercial fixed washing facility that recycles its wash water.
- The use of water to wash down any sidewalks, walkways, driveways, parking lots, tennis courts or other hard surfaced area or building or structure.
- The use of water to fill, refill or add to any indoor or outdoor swimming pools, jacuzzi pools except for neighborhood fire control, pools have recycling water systems and evaporative covers, or if the use of the pool is required by a medical doctor's prescription.
- The use of water to serve a customer in a restaurant unless requested by the customer.
- The use of water for scenic and recreational ponds and lakes, except where necessary to support fish life.
- The use of water from hydrants for construction purposes, fire drills or any purpose other than fire-fighting.
- The use of water by a golf course to irrigate any portion of its grounds except those areas designated as tees and greens and except those irrigated with non-potable water.
- The use of water for dust control.
- Other restrictions deemed appropriate by the City.

4.6.3 Stage 3: Critical Water Emergency

Stage 3 is the level at which the City requires that all nonessential water use is prohibited.

Irrigation Using Potable Water, All Customers The use of water to sprinkle, water, or irrigate any shrubbery, trees, lawns, grass, ground covers, plants, vines, gardens, flowers or any other vegetation is prohibited. Fruit trees and vegetable gardens may be watered only by drip irrigation, handheld hose, or bucket and when done so as to minimize water use.

Residential and Non-Residential Customers The City will require mandatory reduction of all water use except those necessary to maintain human health and safety.

Non-Residential Customers The following water uses are determined to be nonessential, and shall be prohibited during critical water emergency conditions:

- All prohibited activities identified for Non-Residential Customers in Stage 2.
- The use of water to sprinkle, water, or irrigate any shrubbery, trees, lawns, grass, ground covers, plants, vines, gardens, vegetables, flowers or any other vegetation using potable water.

- The use of water in any evaporative or misting cooling system. (Ord. 2864 (part), 2001).
- Other restrictions deemed appropriate by the City.

4.7 Drought Declaration

If a declaration of a severe drought in Lane 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 Lane 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 City's current and future water delivery areas and population projections, demand projections for 10 and 20 years, and the schedule for when the City expects to fully exercise its water rights. The rule also requires comparison of the 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)

The City's anticipated future water service area during the 20-year planning horizon is shown in Exhibit 2-1. (The City has 162 "outside" water service connections that are clustered east and west of City limits, but within the urban growth boundary (UGB); these customers are not shown in Exhibit 2-1.) For purposes of this WMCP, the City expects to expand its service area into the UGB within the 20 year planning horizon.

5.2 Population Projections

OAR 690-086-0170(1)

Population projections for the City of Cottage Grove were obtained from the Portland State University's (PSU) Population Research Center's 2019 Demand Forecast and modified to include the service area population located outside of City limits (474 persons). Exhibit 5-1 lists the service area population values estimated for 2019 and those forecasted for 2030 and 2040. The City's projected population in 2030 is estimated to be 11,229 and 11,924 in 2040.

The PSU analysis assumed an annual average growth rate (AARG) of 0.5 percent from 2019 to 2040, with an AARG of 0.4 percent from 2019 to 2030 and AARG increasing to 0.6 percent for the ten year period from 2030 to 2040.

Exhibit 5-1. Modified PSU Projected Service Area Population

Year	Population
2019	10,758
2030	11,229
2040	11,924

5.3 Demand Forecast

OAR 690-086-0170(3)

The City's MDD demand projections relied on the population projections for its service area presented in Section 5.2 and an MDD per capita water use factor of 314.8 gpcd. The MDD per capita water use factor was the greatest MDD per capita water use observed from 2011 through 2019, which occurred in 2013, as shown in Exhibit 2-7. The population projections for 2030 and 2040 were multiplied by this water use factor to obtain projected maximum day demands in millions of gallons per day within the City's service area. These daily rates were then converted to instantaneous rates measured in cubic feet per second.

Additional demands from the Lamontai Improvement District (District) were added to Cottage Grove's service area forecasts. This District lies southwest of Cottage Grove's service area and serves 98 single family residences with water supplied from 16 wells. The District's water supply, however, is not reliable and the City anticipates that the District will choose to purchase wholesale water from the City to meet its demand by 2025 as provided for in the City and District's intergovernmental agreement. Cottage Grove plans to provide the District 30,000 gallons per day (0.05 cfs). The anticipated future wholesale demands were added to the City's projected service area demands, as shown in Exhibit 5-2.

During development of its demand forecast, Cottage Grove considered the variability in demand anticipated to occur resulting from the effects of climate change. To understand these potential effects, the City referenced the 2019 Willamette Basin Review Feasibility Study published by the U.S. Army Corps of Engineers (USACE).[3] This study noted that climate-induced increases to municipal and industrial demands in the Willamette Basin are anticipated. Specifically, demand is expected to increase on average 0.2 percent per year (2 percent every ten years) from 2020 through 2070 as a result of climate change. Climate change is anticipated to produce warmer, drier summers, leading to increased seasonal demand, such as outdoor uses of water. The City applied this factor to its future MDD estimates to account for the effects of climate variations on demand. Exhibit 5-2 presents these forecasts.

Finally, it should be noted that many municipal water providers often need to divert water at rates higher than calculated MDD rates in order to respond to operation demands. For example, as in-line storage reservoirs are lowered during peak use hours the City will likely need to divert water at rates greater than shown in Exhibit 5-2 to re-fill reservoirs and maintain full water supply lines. These actions are necessary to ensure the protection of public health and safety and to fulfil the obligations of the City as a municipal water supplier.

[3] Willamette Basin Review Feasibility Study, Final Draft (U.S. Army Corps of Engineers, 2019

Exhibit 5-2. Forecasted Demand for the City of Cottage Grove

	City Service Area Demand (mgd)	Wholesale Demand (Lamontai Improvement District) (mgd)	Sum of Forecasted Service Area and Wholesale Demand (mgd)[1]	Climate Impacts (mgd)[2]	Total Forecasted Demand[3]	
					mgd	cfs
2030	3.53	0.03	3.56	0.07	3.63	5.62
2040	3.75	0.03	3.78	0.15	3.93	6.10

1 Sum of service area demands and District wholesale demands.

2 Estimated at 2% per decade per USACE Feasibility Study (2019) applied to "Sum of Forecasted Service Area and Wholesale Demand" values.

3 Sum of values from "Sum of Forecasted Service Area and Wholesale Demand" and "Climate Impacts".

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

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

As described in Section 2, the City currently has five surface water rights available for its municipal water supply. These rights are Certificates 87027, 87028, and 91536, Permit S-42117, and Transfer T-10530. As also described in Section 2, Certificates 87027 and 87028 are not considered a reliable peak season supply, especially in later summer months due to annual volume limitations on the rights. As a result, the City intends to rely on Certificate 91536 (3.1 cfs) and Permit S-42117 (3.1 cfs) to meet projected peak season demands and to use Transfer T-10530 when peak season demands exceeds 6.2 cfs or when Permit S-42117 is curtailed due to fish persistence conditions.

By 2040, the City's MDD is expected to reach 6.10 cfs, as shown in Exhibit 5-2. In a typical year, early in the peak season the City intends to meet this demand by using water under Certificates 87027, 87028, and 91536 and a portion of Permit S-42117. Later in the peak season it is expected that the City will have exhausted the volume allowed under Certificate 87027 and 87028 since these rights provide both water to the City golf course and potable water supply. Therefore, the City intends to meet the projected peak demand later in the peak season by using Certificate 91536 and Permit S-42117. Combined, Certificate 91536 and Permit S-42117 authorize use of up to 6.2 cfs, the approximate projected demand for the planning period of this WMCP, with a nominal consideration for operational demands. As a result, the City anticipates requiring access to the full 3.1 cfs under extended Permit S-42117 within 20 years and is seeking access to 3.1 cfs of "green light water" under extended Permit S-42117.

The City intends to use water under Transfer T-10530 to meet MDD when demand exceeds the 6.2 cfs authorized under Certificate 91536 and Permit S-42117. As noted above, , the City anticipates that its instantaneous rates of diversion will likely exceed 6.2 cfs over the planning period based on typical operational demands of the City's water supply system. Moreover, fish persistence conditions will limit the City's use of Permit S-42117 during certain times of the year when Row River target flows are not met. Therefore, Transfer T-10530 may be needed in any given year depending on system demands and streamflow conditions that may trigger the fish persistence conditions.

5.5 Alternative Sources

OAR 690-086-0170(5)

OAR 690-086-0170(5) requires an analysis of alternative sources of water if any expansion or initial diversion of water allocated under existing permits is necessary to meet future water demand.

(a) Conservation Measures

The City intends to continue implementing its water management and conservation program and to add additional water conservation measures as appropriate over the 20-year planning horizon of this WMCP. However, even with assumed conservation savings of 5 percent (0.30 cfs in 2040) the City will still need to expand diversion of water under Permit S-42117 to meet projected demands, though the savings may delay the need for additional supply in the future.

(b) Interconnections

The City does not currently have any interconnections with other water suppliers. The City is close to Lamontai Improvement District, however the District currently uses the entirety of its supply to meet existing demand, and is not able to provide water to the City on a regular basis. The City has not explored opportunities to obtain water from other providers via interconnections because the distances between the City and other large municipal water providers would make the expense of constructing necessary infrastructure cost-prohibitive.

(c) Cost Effectiveness

OAR 690-086-0170(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 stated above, the City is committed to implementing water conservation measures and has initiated an expansion of the City's water reuse program, but water conservation alone cannot preclude the City's need to expand diversion of water under Permit S-42117 to meet projected demands. In addition, the City already has the infrastructure in place to beneficially use the entirety of Permit S-42117. Consequently, implementing other water conservation measures will not provide water at a cost that is equal or less than the cost of expanding use under Permit S-42117.

WWTP Effluent

The City has considered the reuse of WWTP treated effluent (as described in Section 3.5.5) as an alternative source. When the project to construct the infrastructure necessary to allow for reuse of this treated water is complete in 2021, the City is projected to reuse up to 15 MG from May through September, equating to approximately 0.10 mgd (0.15 cfs). This project will reduce future demand, but not enough to preclude the need for full access to Permit S-42117.

5.6 Quantification of 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 City is planning to need up to 3.1 cfs under extended Permit S-42117 to help meet projected water demands. Assuming that the water right is used at 2 mgd for 31 days during a peak demand month (likely July or August), maximum monthly volume for the water right would be approximately 62 MG.

5.7 Mitigation Actions under State and Federal Law

OAR 690-086-0170(7)

Under OAR 690-086-0170(7), if mitigation is required for expansion 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 regulation. 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.

As a result of the City's Treatment Plant Improvement project, which included construction of a new surface water intake, among other improvements, the City was required to perform numerous mitigation actions associated with the project under state or federal law. One of these conditions included maintaining fish screens on the water intake and pumps. The City continues to maintain the screens on this infrastructure.

In addition, the final order approving an extension of time for Permit S-42117 included "fish persistence" conditions, as described in Section 2, and the City is aware of and will abide by these conditions.

5.8 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 City currently does not plan to acquire additional water rights within the next 20 years.

Appendix A

Letter to Local Government and Courtesy Copy Letters

GSI Water Solutions, Inc.

January 28, 2021

Amber Bell, Planning Director
Lane County Land Management Division
3050 N Delta Hwy
Eugene, OR 97408

Subject: Water Management and Conservation Plan for the City of Cottage Grove

Dear Ms. Bell,

The City of Cottage Grove (City) has 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 (OWRD). Your review is requested.

Under these rules, a water supplier is required to make its draft plan available for review by each affected local government and seek comments relating to consistency with the local governments' comprehensive land use plans. Please find enclosed an electronic copy of the City's Draft WMCP.

Please note that the City is awaiting a final order from OWRD regarding a water right permit extension, therefore the date of this order intentionally is left blank in the City's draft WMCP.

Please provide comments to me by no later than March 3, 2021. If the plan is consistent with your agency's Comprehensive Land Use Plan, a letter response to that effect would be appreciated. You may send your comment to me at the address on this letterhead or e-mail them to me directly at: asussman@gsiws.com.

If you have any questions, please feel free to contact me. My telephone number is (541) 257-9001. Thank you for your interest.

Sincerely,

Adam Sussman
Principal Water Resources Consultant

Enclosure

1600 Western Blvd., Suite 240 Corvallis, OR 97333 P: 541.753.0745 F: 541.754.4211 info@gsiwatersolutions.com www.gsiwatersolutions.com

GSI Water Solutions, Inc.

January 28, 2021

Amanda Gilbert
Coast Fork Willamette Watershed Council
28 S 6th St
Cottage Grove, OR 97424

Subject: Water Management and Conservation Plan for the City of Cottage Grove

Dear Ms. Gilbert,

The City of Cottage Grove has 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. The City is 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 (541) 257-9001 or asussman@gsiws.com.

Sincerely,
GSI Water Solutions Inc.

Adam Sussman
Principal Water Resources Consultant

Enclosure

GSI Water Solutions, Inc.

January 28, 2021

Row River Valley Water District
37570 Row River Rd
Dorena, OR 97434

Subject: Water Management and Conservation Plan for the City of Cottage Grove

To whom it may concern,

The City of Cottage Grove has 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. The City is 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 (541) 257-9001 or asussman@gsiws.com.

Sincerely,
GSI Water Solutions Inc.

Adam Sussman
Principal Water Resources Consultant

Enclosure

GSI Water Solutions, Inc.

January 28, 2021

Gary Grove
Lamontai Improvement District
201 Talemena Dr
PO Box 1257
Cottage Grove, OR 97424

Subject: Water Management and Conservation Plan for the City of Cottage Grove

Dear Mr. Grove,

The City of Cottage Grove has 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. The City is 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 (541) 257-9001 or asussman@gsiws.com.

Sincerely,
GSI Water Solutions Inc.

Adam Sussman
Principal Water Resources Consultant

Enclosure

Appendix B

City Water Rates

(5) Drainage:

Single-family--$824.89/ESU

All other--$824.89/ESU

ESU = equivalent service unit

1 ESU equals 1 single-family dwelling unit or 2,650 square feet of impervious area for all other development

*Code reviser's note: Effective January 1, 2020, rates have been updated pursuant to annual adjustment established by Section 15.16.040.

III. UTILITIES

3004 A. Water System

(13.04.020) Residential Monthly Rates--Inside City Limits: 1996
10/28/19

Water Meter Size	Fixed Rate*	Volume Rate 1--5,999 Gallons**	Volume Rate 6,000--15,000 Gallons**	Volume Rate Over 15,000 Gallons**
5/8" x 3/4"	$17.98	$1.42	$1.75	$2.05
1"	36.89	1.42	1.75	2.05
1-1/2"	68.45	1.42	1.75	2.05
2"	106.29	1.42	1.75	2.05
3"	207.20	1.42	1.75	2.05
4"	320.75	1.42	1.75	2.05
6"	636.16	1.42	1.75	2.05
8"	1,014.63	1.42	1.75	2.05

Residential Monthly Rates--Outside City Limits:

Water Meter Size	Fixed Rate*	Volume Rate 1--5,999 Gallons**	Volume Rate 6,000--15,000 Gallons**	Volume Rate Over 15,000 Gallons**
5/8" x 3/4"	$26.97	$2.13	$2.63	$3.08
1"	55.34	2.13	2.63	3.08

1-1/2"	102.68	2.13	2.63	3.08
2"	159.44	2.13	2.63	3.08
3"	310.80	2.13	2.63	3.08
4"	481.13	2.13	2.63	3.08
6"	954.24	2.13	2.63	3.08
8"	1,521.95	2.13	2.63	3.08

Commercial Monthly Rates--Inside City Limits:

Water Meter Size	Fixed Rate*	Commodity**
5/8" x 3/4"	$30.33	$1.77
1"	64.03	1.77
1-1/2"	120.29	1.77
2"	187.74	1.77
3"	367.65	1.77
4"	570.05	1.77
6"	1,132.28	1.77
8"	1,806.92	1.77

Commercial Monthly Rates--Outside City Limits:

Water Meter Size	Fixed Rate*	Commodity**
5/8" x 3/4"	$45.50	$2.65
1"	96.05	2.65
1-1/2"	180.44	2.65
2"	281.61	2.65
3"	551.48	2.65
4"	855.08	2.65
6"	1,698.42	2.65
8"	2,710.38	2.65

Industrial Monthly Rates--Inside City Limits:

Water Meter Size	Fixed Rate*	Commodity**
5/8" x 3/4"	$23.65	$1.77
1"	43.98	1.77
1-1/2"	77.89	1.77
2"	118.55	1.77
3"	226.98	1.77
4"	348.99	1.77
6"	687.89	1.77
8"	1,094.56	1.77

Industrial Monthly Rates--Outside City Limits:

Water Meter Size	Fixed Rate*	Commodity**
5/8" x 3/4"	$35.47	$2.65
1"	65.97	2.65
1-1/2"	116.84	2.65
2"	177.83	2.65
3"	340.47	2.65
4"	523.49	2.65
6"	1,031.84	2.65
8"	1,641.84	2.65

Irrigation Monthly Rates--Inside City Limits:

Water Meter Size	Fixed Rate*	Commodity**
5/8" x 3/4"	$26.49	$2.99
1"	60.68	2.99
1-1/2"	117.64	2.99
2"	186.03	2.99

3"	368.35	2.99
4"	573.51	2.99
6"	1,143.30	2.99
8"	1,827.05	2.99

Irrigation Monthly Rates--Outside City Limits:

Water Meter Size	Fixed Rate*	Commodity**
5/8" x 3/4"	$39.74	$4.49
1"	91.02	4.49
1-1/2"	176.46	4.49
2"	279.05	4.49
3"	552.53	4.49
4"	860.27	4.49
6"	1,714.95	4.49
8"	2,740.58	4.49

* Fixed rate shall be prorated to the number of days of service in that particular month.

** For each 1,000 gallons or fraction thereof.

(13.04.020) Special Monthly Rates: 1996
10/28/19

Assisted Rates	Water Meter Size	Fixed Rate*	Volume Rate 1--5,999 Gallons**	Volume Rate 6,000--15,000 Gallons**	Volume Rate Over 15,000 Gallons**
Inside City Limits	5/8" x 3/4"	$7.39	$1.42	$1.75	$2.05
Outside City Limits	5/8" x 3/4"	$11.09	$2.13	$2.63	$3.08

* Fixed rate shall be prorated to the number of days of service in that particular month.

** For each 1,000 gallons or fraction thereof.

(13.04.020) Miscellaneous Water Fees: 1996
10/28/19

Water meter sizing: $27.00

Meter Downsizing Fees:

1" to 3/4" $115.63

1-1/2" to 3/4" $260.24

2" to 3/4" $263.66

1-1/2" to 1" $308.48

2" to 1" $311.90

2" to 1-1/2" $554.52

Downsizing not listed above will be performed on a time and materials basis.

(13.04.070)	Delinquent bill turn on fee: $35.00	1996
(13.04.040)	Turn on fee: $35.00 (Nonrefundable)	10/28/19
(13.04.070)	Tampering with locks: $100.00 plus costs, if any	1996 10/28/19
(13.04.080)	After-hour turn on fee: $75.00	1996 10/28/19
(13.04.110)	Testing meters: $50.00 minimum	1996 10/28/19
(13.04.030)	Connection fees--domestic:	1996 10/28/19

(1) a. Water main tapped and service line has been extended with proper fitting to the meter box:

Meter Size	Fee
3/4"	$275.00
1"	$325.00
Over 1"	Actual Costs

(2) b. Main needs to be tapped and service line extended to private property:

Meter Size	Fee

	3/4"	$1,200.00	
	1"	$1,400.00	
	Over 1"	Actual Costs	

c. Connection Fees--Outside City Limits:

1.5 x fees in subsections (a) and (b) above.

(13.04.230) Fire Protection--Connection Fee: 1996 10/28/19

All actual costs + 10% restocking fee for all parts used.

(13.04.220) Fees for Temporary Water Service from Fire Hydrants: 1996 10/28/19

Bulk water sale (nonrefundable) per fill up $30.00

Nonrefundable service installation fee $81.00

Refundable deposit $150.00

Base rate for 3" water meter (per week) $91.91

Base rate for 3" water meter (per month) $367.65

Consumption fee (inside city limits) $1.77/1,000 gallons

Consumption fee (outside city limits) $2.65/1,000 gallons

(13.04.040) Cash Deposit for Water and Water/Wastewater Service: $150.00 1996 10/28/19

All actual costs + 10% restocking fee for all parts used.

2548

B. Wastewater System

Sec. 6 (13.08.060) Monthly Rates 1996 10/28/19