

# Water Management and Conservation Plan

Prepared for

City of Toledo, Oregon



September 2017

Prepared by



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# Oregon

Kate Brown, Governor

## Water Resources Department

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October 4, 2017

City of Toledo

Attn: Michael J. Adams, Public Works Director

206 N Main Street

Toledo, OR 97391

Subject: Water Management and Conservation Plan

Dear Mr. Adams:

Enclosed, please find the final order approving the City of Toledo's (City) water management and conservation plan and authorizing the diversion of up to 1.65 cfs of water under Permit S-9370.

The attached final order specifies that the City's plan shall remain in effect until **October 4, 2027**. Additionally, the City is required to submit a progress report to the Department by **October 4, 2022**, detailing progress made toward the implementation of conservation benchmarks scheduled in the plan. Finally, the City must submit an updated Water Management and Conservation Plan to the Department by **April 4, 2027**.

***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 Toledo 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 503-986-0883 or [Chris.C.Kowitz@oregon.gov](mailto:Chris.C.Kowitz@oregon.gov) if you have any questions.

Sincerely,



Chris Kowitz

Water Management and Conservation Analyst

Water Right Services Division

Enclosure

cc: WMCP File  
Nikki Hendricks, District #1 Watermaster (via e-mail)  
GSI Water Solutions, Inc. Attn: Adam Sussman 1600 Western Blvd., Suite 240 Corvallis, OR 97333





**BEFORE THE WATER RESOURCES DEPARTMENT  
OF THE  
STATE OF OREGON**

In the Matter of the Proposed Water	)	FINAL ORDER APPROVING A
Management and Conservation Plan for	)	WATER MANAGEMENT AND
City of Toledo, Lincoln County	)	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 Toledo (City) submitted a Water Management and Conservation Plan (plan) to the Water Resources Department (Department) on April 3, 2017. The required statutory fee for review of the plan was also received by the Department on April 3, 2017. The plan was required by a condition set forth in the final orders issued on December 3, 2013 approving an extension of time for Permits S-9370 and S-44083
2. The Department published notice of receipt of the plan on April 11, 2017, 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 June 29, 2017. In response, the City submitted a revised plan on August 25, 2017.
4. The Department reviewed the revised plan and finds that it contains all of the elements required under OAR 690-086-0125 and OAR 690-086-0130.
5. The projections of future water needs in the plan demonstrate a need for 1.65 cfs of water available under Permit S-9370 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 21.9 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 the continued implementation of annual water audits; requiring meters on all new connections; continue to test meters over 2 inches annually and monitor smaller meters on a monthly basis; bill customers based, in part, on the quantity of water metered at the service connection; and, continue regular visual inspections of its waterlines and tracking of leaks using AMR, as well as prompt repair of any detected leaks.
8. The plan includes 5-year benchmarks for evaluation, development, and implementation of programs of the following conservation measures:
  - a. Annual Water Audit
    - i. In the next two years, the City will install meters and/or develop methods to estimate unmetered authorized uses.
  - b. System-wide Metering
    - i. In the next two years, the City will install a meter at the bulk water station.
  - c. Leak Detection
    - i. If adding meters and/or estimating currently unmetered authorized uses do not reduce the City's non-revenue water below 15 percent based on two years of data, then the City will begin conducting a systematic leak detection survey using its leak detection equipment within one year of that determination.
    - ii. In the next five years, the City will pursue replacement and refurbishment of components of the Mill Creek raw water supply system as budget allows.
  - d. Public Education
    - i. In the next year, the City will provide water conservation messages in its newsletter at least twice per year.
    - ii. In the next five years, the City will add water conservation content to its website.
    - iii. In the next five years, the City will obtain water conservation brochures from a water conservation organization and add website content about indoor and outdoor water conservation.
    - iv. In the next five years, the City will begin promoting water conservation at one community event each year, for example at the weekly outdoor farmer's market.
    - v. In the next five years, the City will begin including an insert about water conservation in water bills at the beginning of summer and one other time during the year.

9. The plan identifies the Siletz River and Mill Creek as the sources of the City's water rights. Additionally, the plan accurately and completely describes the sensitive, threatened, and endangered species in the Siletz River and Mill Creek watersheds as well as the water quality parameters for which this portion of the Siletz River and Mill Creek have been listed as water quality limited by the Oregon Department of Environmental Quality.
10. The water curtailment element included in the plan satisfactorily promotes water curtailment practices and includes a list of four stages of alert with concurrent curtailment actions.
11. The diversion of water under Permit S-9370 will be increased during the next 20 years and is consistent with OAR 690-086-0130(7), as follows:
  - a. As evidenced by the 5-year benchmarks described in Findings of Fact #7 and #8, the final revised plan 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. After evaluating alternative sources, the need to provide resiliency and redundancy in the water system, and that water savings alone from identified conservation cannot fully meet the City's water demand projections, the Department has determined that access to an increased diversion of water under Permit S-9370 is the most feasible and appropriate alternative to the supplier.
  - c. The Final Orders approving Extensions of Time for Permit S-9370 and S-44083 include Conditions to Maintain the Persistence of Listed Fish. The City is not required to take any other mitigation actions under state or federal law.

### **Conclusion of Law**

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

**Now, therefore, it is ORDERED:**

#### **Duration of Plan Approval:**

1. The City of Toledo's Water Management and Conservation Plan is approved and shall remain in effect until **October 4, 2027**, unless this approval is rescinded pursuant to OAR 690-086-0920.

#### **Development Limitations:**

2. The limitation of the diversion of water under the unperfected portion of Permit S-9370 established in the Final Order approving an Extension of Time (*issued on December 3, 2013*) is removed and, subject to other limitations or conditions of the permit, the City of Toledo is authorized to divert up to **1.65 cfs** (*out of the total permitted 2.66cfs*) under the unperfected portion of Permit S-9370.
3. The limitation of the diversion of water under Permit S-44083 established in the Final Order approving an Extension of Time (*issued on December 3, 2013*) remains unchanged. Subject

to other limitations or conditions of the permit, therefore, the City of Toledo is not authorized to divert any water under Permit S-44083 at this time.

**Plan Update Schedule:**

4. The City of Toledo shall submit an updated plan meeting the requirements of OAR Chapter 690, Division 086 within 10 years and no later than **April 4, 2027**.

**Progress Report Schedule:**

5. The City of Toledo shall submit a progress report containing the information required under OAR 690-086-0120(4) by **October 4, 2022**.

**Other Requirements for Plan Submittal:**

6. 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 Toledo 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 9 day of October, 2017.



Dwight French  
Water Right Services Division Administrator, for  
Thomas M. Byler, Director  
Oregon Water Resources Department

Mailing date: OCT 12 2017

**Notice Regarding Service Members:** Active duty service members have a right to stay proceedings under the federal Service Members Civil Relief Act. 50 U.S.C. App. §§501-597b. You may contact the Oregon State Bar or the Oregon Military Department for more information. The toll-free telephone number for the Oregon State Bar is: 1 (800) 452-8260. The toll-free telephone number of the Oregon Military Department is: 1 (800) 452-7500. The Internet address for the United States Armed Forces Legal Assistance Legal Services Locator website is: <http://legalassistance.law.af.mil>



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**Appendices**

Appendix A: Letters to Local Governments and Comments

Appendix B: Port of Umatilla WMCP Excerpt

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## SECTION 1

# Water Supplier Plan

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*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.*

## Introduction

The City of Toledo, located on the Yaquina River just 7 miles inland from the Pacific Ocean, was first established in 1866. The City is small yet bustling, having an active railway, pulp mill, harbor with a repair port for oceangoing vessels, art galleries and studios, museums, and amenities for families. The City considers responsible water management and conservation to be fundamental to sustaining and growing its unique community.

This Water Management and Conservation Plan (WMCP, or Plan) is intended to guide development of the City's water management and conservation programs with the goal of achieving sustainable water use while meeting the City's future water needs. The City considers this WMCP is to be a working document that will positively influence the City's water management for years to come.

## Plan Requirement

This is the City's first WMCP. This WMCP is required by two final orders the Oregon Water Resources Department (OWRD) issued on December 3, 2013 approving the City's applications for extensions of time for Permits S-9370 and S-44083. The final orders extend the development deadlines for the City's water use permits S-9370 and S-44083 to October 1, 2055, but preclude any increased diversion of water under the permits until the City submits and OWRD approves a WMCP. The City is required to submit the WMCP within three years of the date of the Final Order (by December 3, 2016). In November 2016, the City requested to extend the deadline to submit the WMCP to April 3, 2017. OWRD approved this request on October 28, 2016.

This WMCP meets all of the requirements of the Oregon Administrative Rules (OAR) adopted by the Water Resources Commission in November 2002 (OAR Chapter 690, Division 86) regarding WMCPs.

## Plan Organization

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

<b>Section</b>	<b>Requirement</b>
Section 1 –Water Supplier Plan	OAR 690-086-0125
Section 2 –Water Supplier Description	OAR 690-086-0140
Section 3 –Water Management and Conservation	OAR 690-086-0150
Section 4 –Water Curtailment	OAR 690-086-0160
Section 5 –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 of Toledo Water Master Plan [Civil West Engineering Inc., 2010 and 2017]
- City of Toledo staff
- Portland State University Population Research Center (PSU PRC)
- Oregon Water Resources Department (OWRD)

## Affected Governments

### *OAR 690-086-0125(5)*

The following local governments are considered affected local governments under OWRD’s administrative rules:

- City of Toledo
- Lincoln County

In addition, the City provided Seal Rock Water District and the City of Newport with a copy of the draft plan as a courtesy.

Thirty days before submitting this WMCP, the City made the draft WMCP available for review by each affected local government listed above along with a request for comments relating to consistency with the local government’s comprehensive land use plan. The letters requesting comment and any comments received are in **Appendix A**.

## 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 5 years of the final order.

## **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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## SECTION 2

# Water Supplier Description

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*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 system leakage.*

## Water Sources

### OAR 690-086-0140(1)

The City's sources of water are the Mill Creek watershed and the Siletz River. The City water supply from the Mill Creek watershed consists of natural flow from Mill Creek and an unnamed branch of Mill Creek, and released stored water from Mill Creek Reservoir, which are diverted via an intake at the Mill Creek Reservoir. Water from the reservoir is conveyed approximately 5.4 miles to the City's water treatment plant (WTP). The City diverts water from the Mill Creek watershed primarily in winter and spring when there is high turbidity in the Siletz River.

The City's point of diversion on the Siletz River is at approximately River Mile 40. Water is conveyed through a raw water transmission pipeline (the Siletz River raw water pipeline) approximately 6 miles from the intake to the City's WTP. The City diverts water from the Siletz River primarily in the summer and fall when Mill Creek watershed streamflows are greatly reduced and algal blooms diminish water quality in Mill Creek Reservoir.

## Interconnections with Other Systems

### OAR 690-086-0140(7)

The City has an interconnection with Seal Rock Water District (SRWD). Through formal agreement, SRWD is provided treated water as if the SRWD were a typical retail customer within the City. Water is sent to SRWD through a City-owned and maintained dedicated transmission mainline to a pre-determined location/pump station. The water is then pumped to SRWD via the SRWD-owned/operated Toledo pump station (maximum capacity: 1 mgd, or 700 gpm) and 12-inch diameter transmission line.

The City also has an agreement to provide water to Wright Creek Water District (WCWD) as a wholesale customer through a connection to the transmission mainline utilized to serve SRWD.

## Intergovernmental Agreements

### OAR 690-086-0140(1)

In 1972, the City coordinated with the SRWD to utilize the Siletz River as a mutual water source and to construct an intertie between the two communities. This long-range water supply plan was approved by the Lincoln County Board of Commissioners in 1974. The City and SRWD subsequently constructed the Toledo WTP, made improvements to the Siletz River raw water pipeline, and constructed the Seal Rock intertie pipeline and pumping station. The cost of

these projects was shared between the City and SRWD. The 2012 agreement states that the City agrees to sell and provide SRWD the maximum of 50 percent of the potable water supply capacity of the City's WTP per day on a wholesale basis and that SRWD agrees to purchase a minimum of 90 MG per year.

The City has an agreement dating back to 2001 to provide surplus treated municipal water to up to 12 dwelling units within WCWD. Surplus water means any water not needed by the City to serve its residential users within city limits and SRWD as per the intergovernmental agreement between the City and SRWD.

Although not an intergovernmental agreement, the City has an agreement (signed in 2015 and renewed in 2016) to provide up to 1.25 mgd of untreated water to Georgia Pacific when needed, but the quantity provided to Georgia Pacific may be restricted if demand by existing municipal customers requires too much of the available water under the City's water rights to supply the full 1.25 mgd.

## Service Area Description and Population

### *OAR 690-086-0140(2)*

Currently the City serves the area within city limits plus an additional 71 residential connections and 6 commercial connections (as of December 2015) outside of city limits, as well as a few connections located outside of the UGB (primarily in the South Bay Road area and Sturdevant Place neighborhood) (**See Exhibit 2-1**). According to the City's Draft 2017 Water System Master Plan (WSMP), the City's estimated population was 3,514 in 2016. This population was estimated by applying an average annual growth rate of 0.7% (slightly greater than the average annual growth rate from 1970 to 2010 of 0.52%) to Portland State University's Population Research Center (PSU PRC) estimate for 2015 of 3,490. The Draft WSMP assumes that population served by the 71 residential connections outside of city limits is incorporated in that population estimate, which would be a population of approximately 185 in 2015 ( $71 \text{ connections} \times 2.6 \text{ average people per household per the 2010 U.S. Census} = 185$ ).

In addition, the City serves water to the SRWD, which is considered a wholesale water customer. The City also provides wholesale water to Wright Creek Water District. SRWD provides water to unincorporated coastal communities between of the cities of Newport and Waldport. The 2016 summer peak season population served by the SRWD was estimated to be 5,746, according to the City's 2017 Draft WSMP. The SRWD population was estimated by applying an average annual growth rate of 1.5% (based on the best-fit model for average annual population increased from 1997 to 2007 described in the 2014 SRWD WMCP) to the 2014 SRWD WMCP population estimate of approximately 5,177 in 2009. Adding the estimated SRWD population and the City's population results in a 2015 service area population estimate of 9,067. Wright Creek Water District is allowed a maximum of 12 connections under the contract with the City, but the district consisted of only eight customers connections at the time the contract was approved in 2001 and the current number of connections is unknown. Assuming that the number of connections has not changed since 2001, the district's population is approximately 21.



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

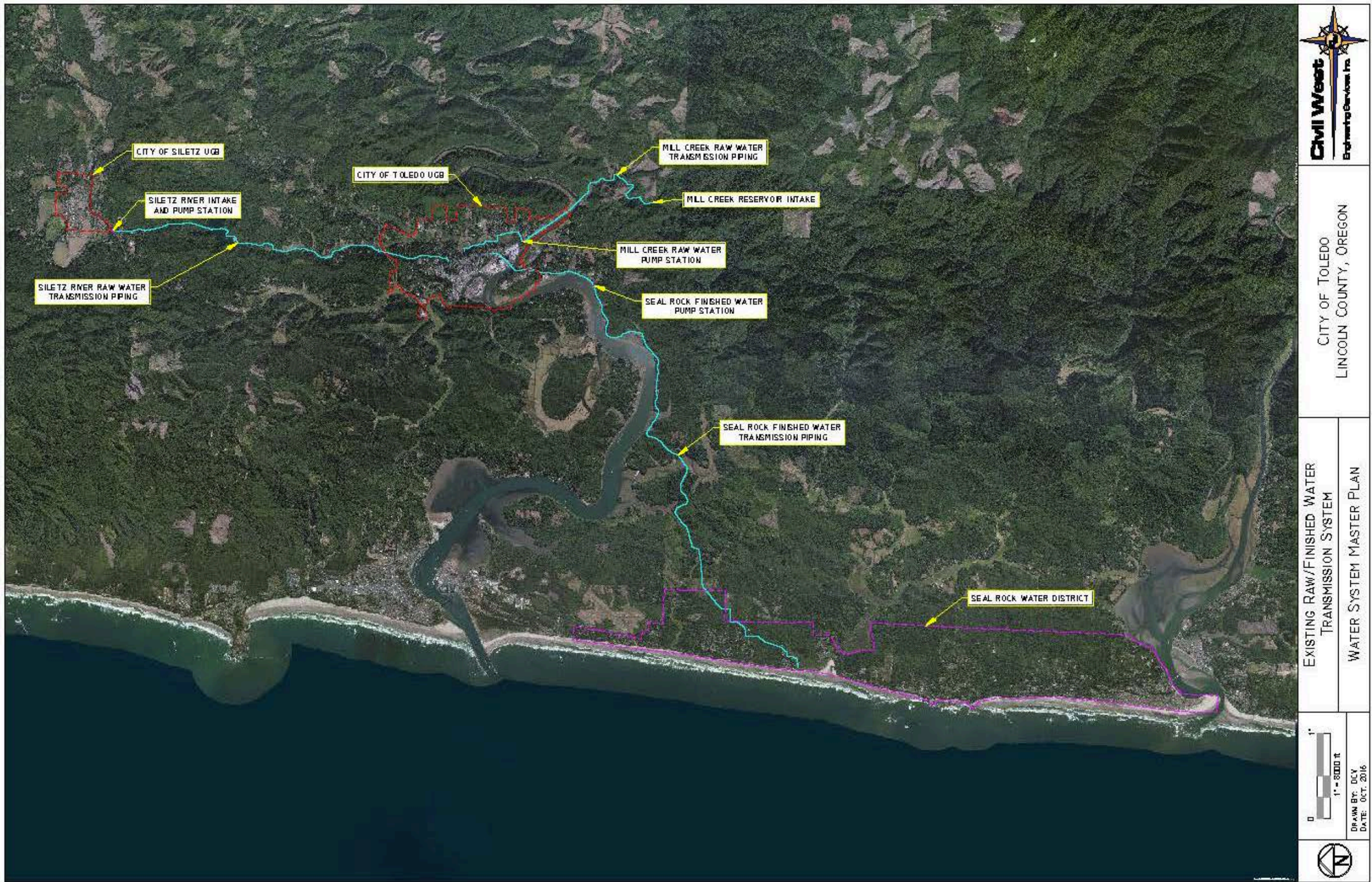
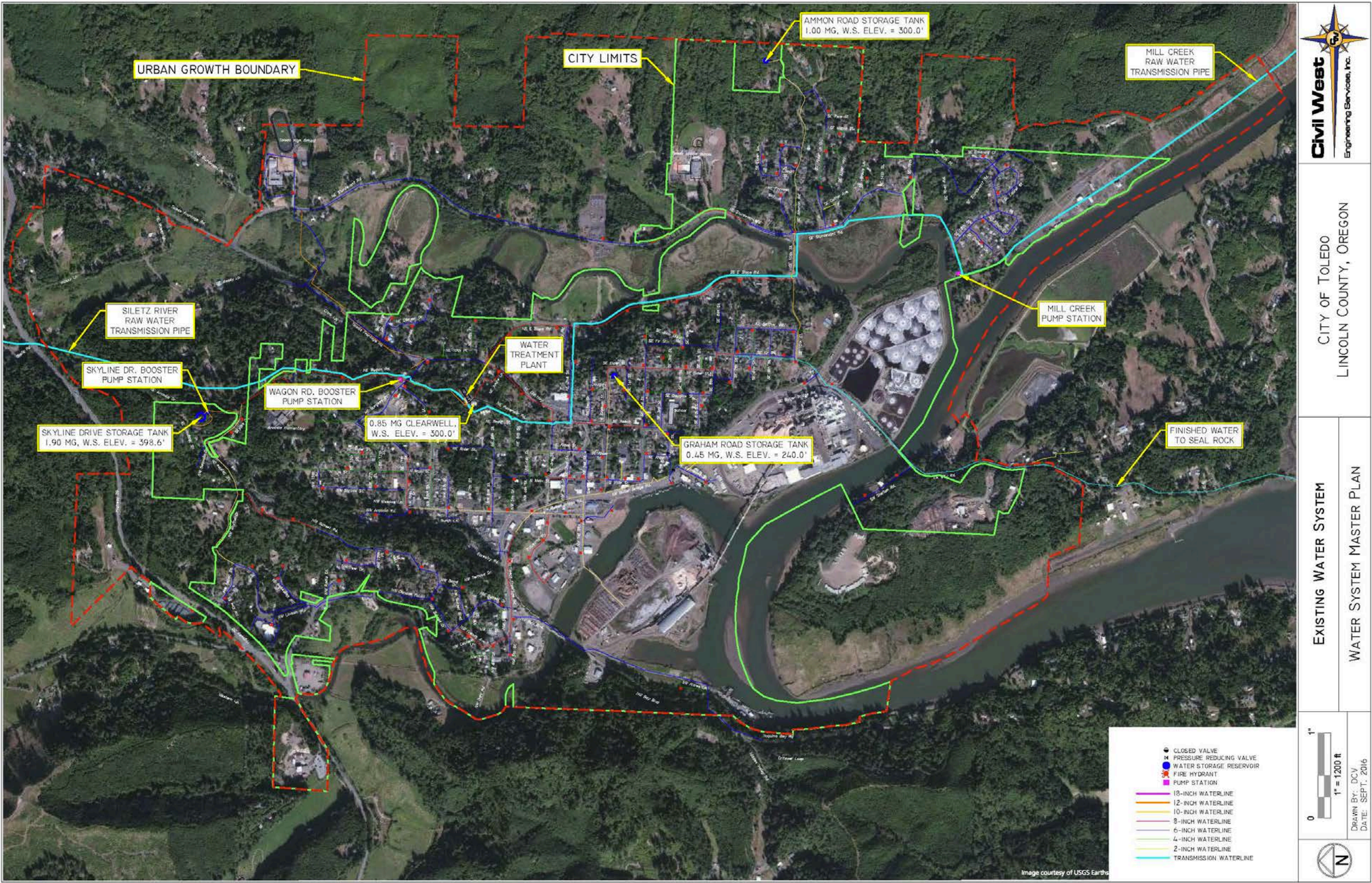




Exhibit 2-1. Water Delivery Area Map and System Schematic, Continued.





## Records of Water Use

*OAR 690-086-0140(4) and (9)*

### Terminology

Demand refers to the quantity of finished water delivered to the water distribution system from the water treatment plant (WTP). Demand includes metered consumption, unmetered uses, and water lost to leakage and reservoir overflow. For the purposes of this WMCP, the terms demand and production are synonymous. Consumption refers to the portion of water use that is metered. Generally, demand and consumption in municipal systems are expressed in units of million gallons per day (mgd). They may also be expressed in 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 typically reported in million gallons (MG). Water use per person (per capita use) is expressed in gallons per person (per capita) 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. It is also called the one-day MDD.
- Maximum monthly demand (MMD) in MG equals the highest total monthly demand of the 12 months of a calendar year. MMD in mgd equals the average day demand of the one month with the highest total demand of the 12 months of a calendar year.
- 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.

# Historical Water Demands

## Annual and Daily Demands

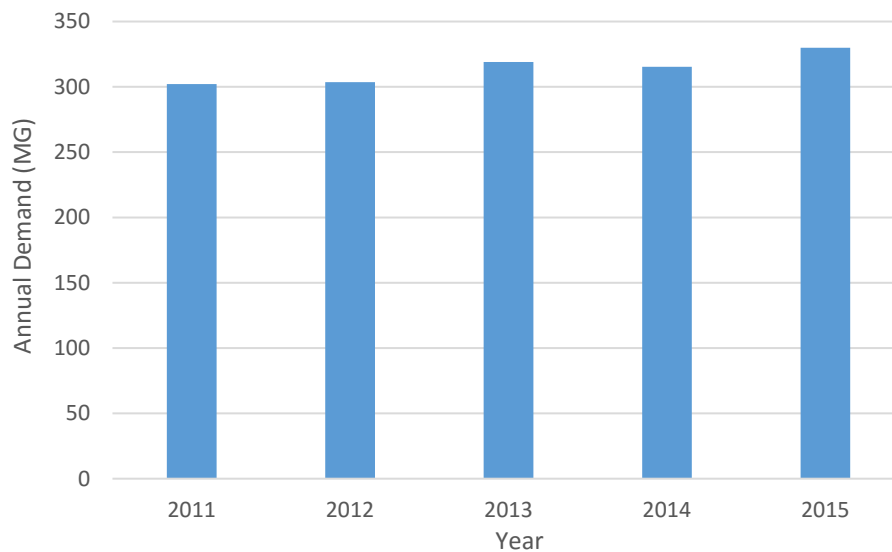
**Exhibit 2-2** summarizes the City's finished water demands from 2011 through 2015. The water demand data are based on data from the finished water meter at the WTP.

**Exhibit 2-2. Historical Annual Finished Water Demand, Average Day Demand, Maximum Day Demand, and Maximum Month Demand, 2008-2014.**

Year	Annual Demand (MG)	ADD (mgd)	MDD (mgd)	Peaking Factor (MDD: ADD)	MMD (mgd)	MMD (MG)
2011	302.1	0.83	1.66	2.0	30.7	0.99
2012	303.6	0.83	1.21	1.5	32.5	1.05
2013	319.0	0.87	1.49	1.7	32.9	1.06
2014	315.3	0.86	1.34	1.6	32.1	1.04
2015	329.9	0.90	1.71	1.9	33.9	1.09
Average	314.0	0.86	1.48	1.7	32.4	1.0
Highest	329.9	0.90	1.71	2.0	33.9	1.1

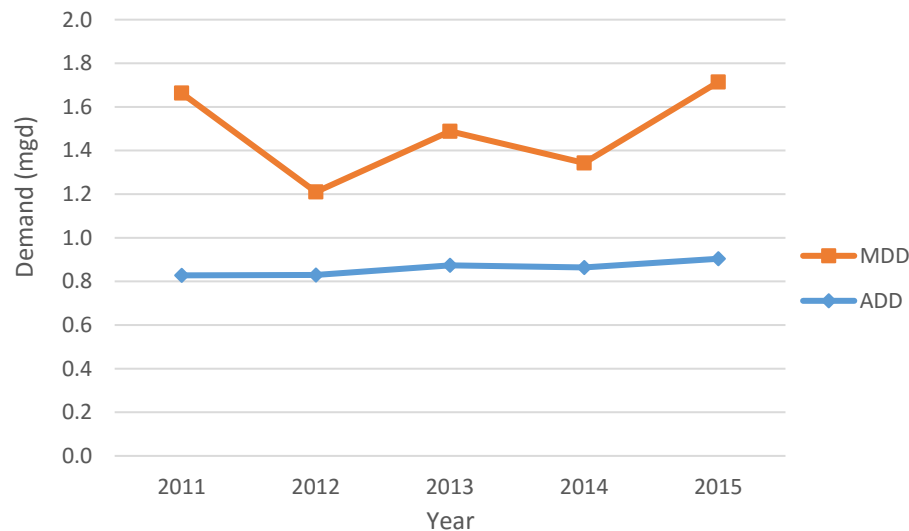
As shown in **Exhibit 2-2** and **Exhibit 2-3**, the City's annual demand generally increased from 2011 through 2015. The City's annual demand peaked at 329.9 MG in 2015.

**Exhibit 2-3. Annual Demand (MG), 2011-2015.**



**Exhibit 2-2 and 2-4** reveal that MDD has fluctuated to a greater extent than the ADD. From 2011 through 2015, ADD generally increased annually from 0.83 mgd to 0.90 mgd, while MDD fluctuated from 1.21 mgd to 1.71 mgd and did not show the same annually increasing trend.

Exhibit 2-4. Average Day Demand (ADD) and Maximum Day Demand (MDD), 2011-2015.



MDD is an important value for water system planning. Water rights and supply facilities (e.g. treatment plants, pipelines, and reservoirs) must be capable of meeting a city's MDD. If the MDD exceeds the combined supply capacity on any given day, finished water storage levels will be reduced, and if the MDD exceeds combined supply capacity on several consecutive days, a water shortage may occur.

Weather patterns and economic conditions strongly influence MDD. Particularly hot and/or dry weather can result in more outdoor irrigation, thereby increasing MDD. Weather patterns that can cause fluctuations in MDD from year to year include: maximum temperatures, the number of consecutive days with high temperatures, the timing of high temperatures in the summer, total rainfall levels during the summer, and consecutive days without rainfall. The economy can affect MDD by influencing customers' spending on irrigation, the building of new homes with landscapes needing intense irrigation for plant establishment, and the opening or closing of facilities that use water in their operations. Both weather patterns (including the season of year) and economic conditions influence tourist activity and vacation home usage on the coast, and thereby MDD, as well.

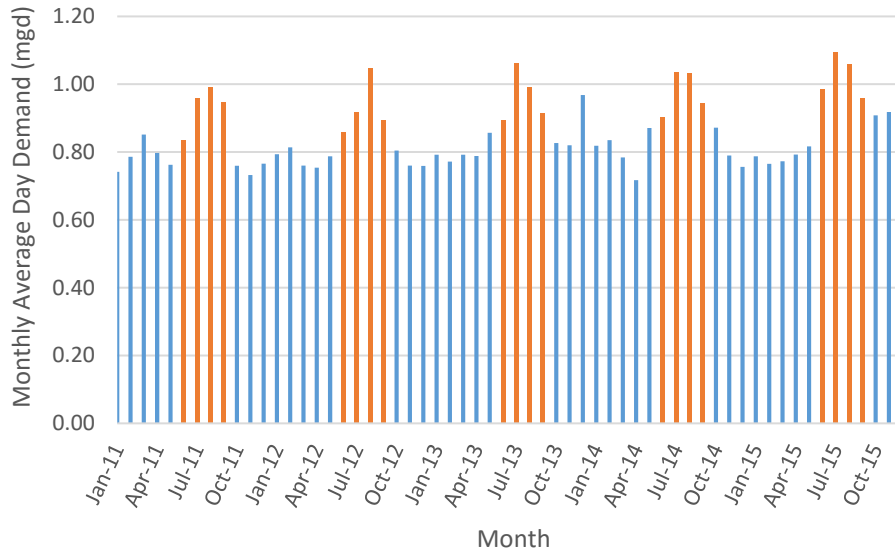
## Peaking Factors

Peaking factors are the ratios of one demand value to another. The most common peaking factor is the ratio of the MDD to the ADD. This ratio often is used for estimating peak demands when only ADDs are known or measured, as well as for hydraulic modeling of a system and demand forecasting. The City's MDD to ADD peaking factor ranged from 1.5 to 2.0 and averaged 1.7 from 2011 through 2015. The City's average peaking factor is similar to other water providers in the western Oregon, such as the City of Corvallis (averaged 2.1 from 2005 to 2009; City of Corvallis 2012 WMCP) and the City of Florence (averaged 1.8 from 2004-2008; City of Florence 2009 WMCP).

## Monthly Demand

From 2011 through 2015, the City's average maximum month demand volume was 32.2 MG, as shown in **Exhibit 2-2**. During this period, the MMD occurred twice in August and three times in July. **Exhibit 2-5** illustrates monthly ADD from 2011 through 2015, with the peak season months of June through September shown in orange. The highest monthly ADD was 1.09 mgd in July 2015.

**Exhibit 2-5. Monthly Average Day Demand (mgd), 2011-2015. Orange indicates peak season months (June through September) while blue indicates non-peak season months.**

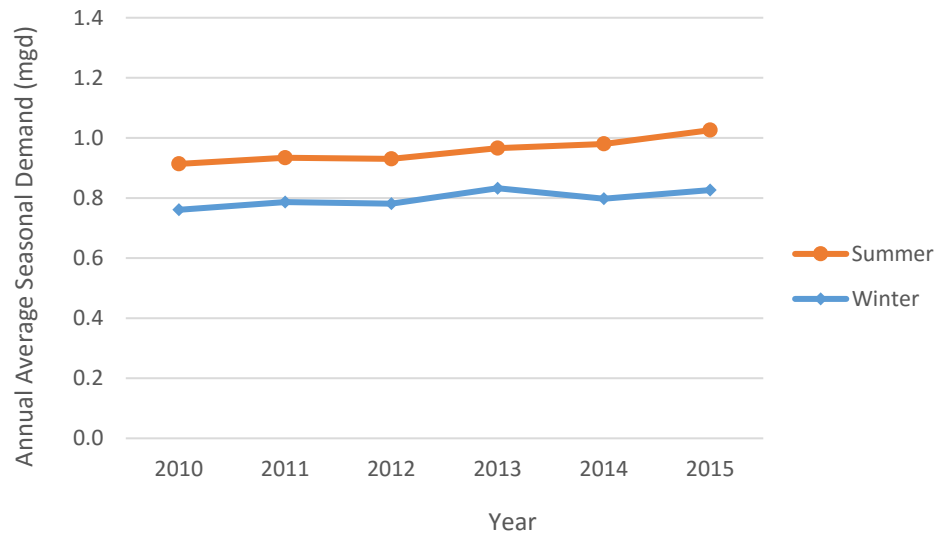




## Seasonal Demand

**Exhibit 2-6** shows that Summer (June through September) ADD ranged from 0.91 mgd to 1.03 mgd and Winter (December through March) ADD ranged from 0.76 mgd to 0.83 mgd from 2011 through 2015. During this period, the average of the City's ADD in the summer was 1.2 times greater than the average of the City's ADD in the winter, reflecting the modest increase in demand for irrigation water on a typical day during the summer months.

**Exhibit 2-6. Historical Seasonal Demand (mgd), 2011-2015.**  
 Summer = June to September. Winter = December to March.



# Customer Characteristics and Use Patterns

## OAR 690-086-0140(6)

### Customer Description

The City maintains ten finished water billing classes that fall within five major customer categories. **Exhibit 2-7** shows how the City's finished water billing classes were categorized.

Exhibit 2-7. Finished Water Billing Classes and Customer Categories.

Customer Category	Billing Class	Description
Public	Non-billed	Municipal water connections and Port of Toledo
	Hydrant Flushing	Annual estimated hydrant flushing
	Unmetered Shops	Water used at City of Toledo shops and to fill Vactor <sup>1</sup>
Residential	Single Family	Single family residential water customers
	Multi-Family	Multi-family residential water customers
	Outside Residential	Residential water customers outside city limits
Commercial	Commercial	Commercial water customers
	Outside Commercial	Commercial water customers outside city limits
Industrial	Industrial	Industrial water customers (includes finished water consumption by Georgia Pacific)
Wholesale to Water Districts	Districts	Water sales to Seal Rock Water District and Wright Creek Water District

In addition, the City has one raw water customer, Georgia Pacific, to whom the City conveys water when Georgia Pacific's water supply is unavailable. Georgia Pacific consumed a total of 9.8 MG of raw water in 2015 during the months of October and November.

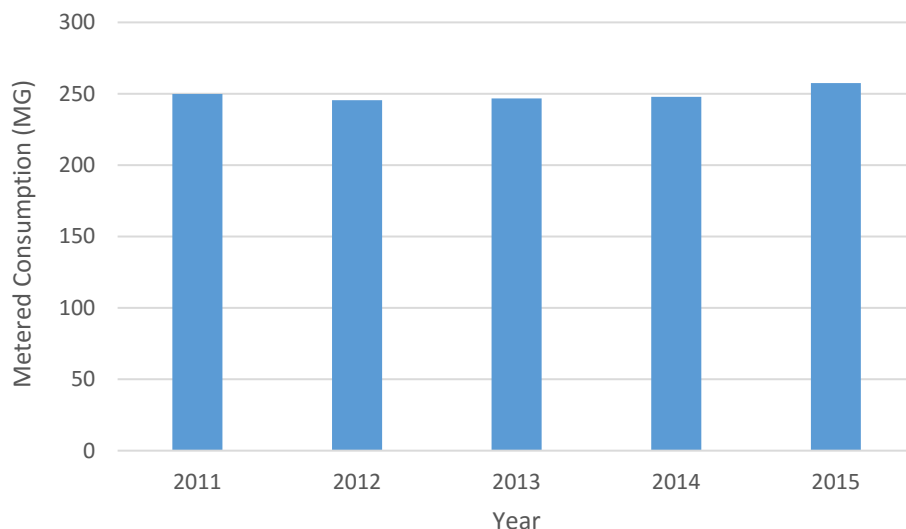
The consumption analyses below concern finished water.

<sup>1</sup> A vactor is a truck that can be used to clean gravity transmission lines (sewer and stormwater lines). A vactor can also be used as a portable lift station to handle wastewater flows during repairs.

## Annual Consumption

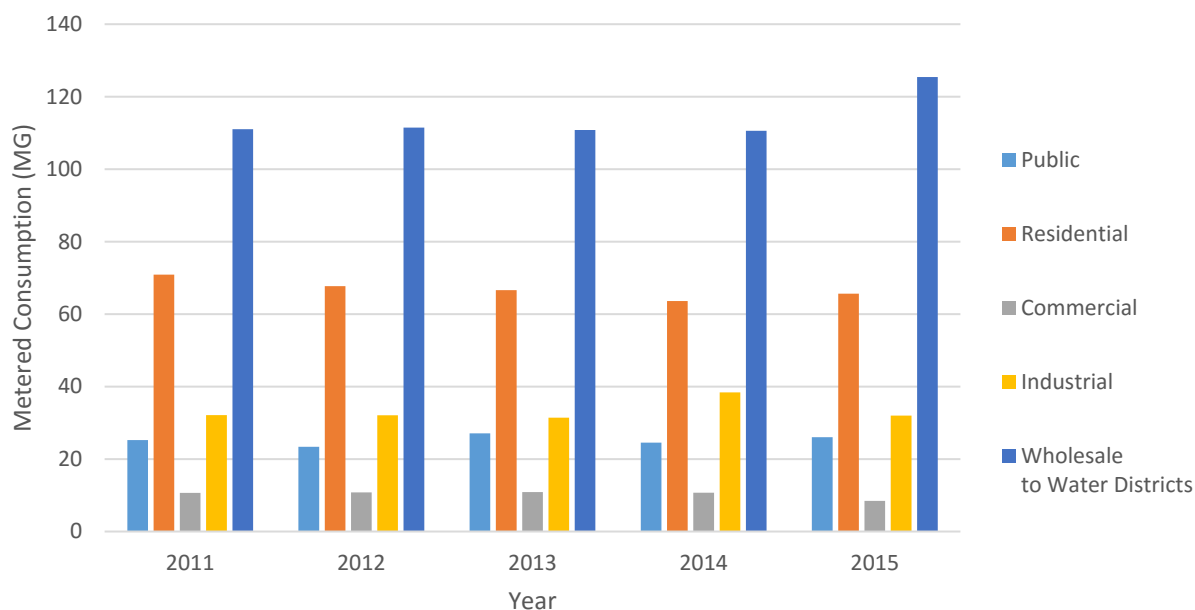
**Exhibit 2-8** shows that total annual finished water consumption decreased from 2011 to 2012, then showed modest increases thereafter.

**Exhibit 2-8. Annual Water Use, 2011-2015.**



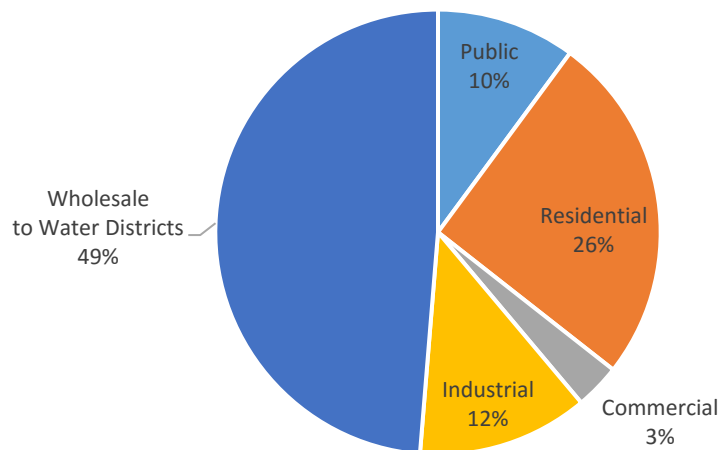
As shown in **Exhibit 2-9**, apart from wholesale water sales, the residential customer category consistently consumed the most water during the period 2011 through 2015. Residential water consumption generally decreased from 2011 through 2015, while other customer categories have fluctuated, but did not exhibit any trends.

**Exhibit 2-9. Annual Water Use by Customer Category, 2011-2015.**



**Exhibit 2-10** illustrates that nearly half of the water sold by the City in 2015 went to its wholesale customers. Approximately half of the water sold to City customers (one-quarter of total sales) went to residential water use within the City. The customers in the public and industrial customer categories consumed nearly all of the remaining water, with only 3 percent of total sales going to the City's commercial customers.

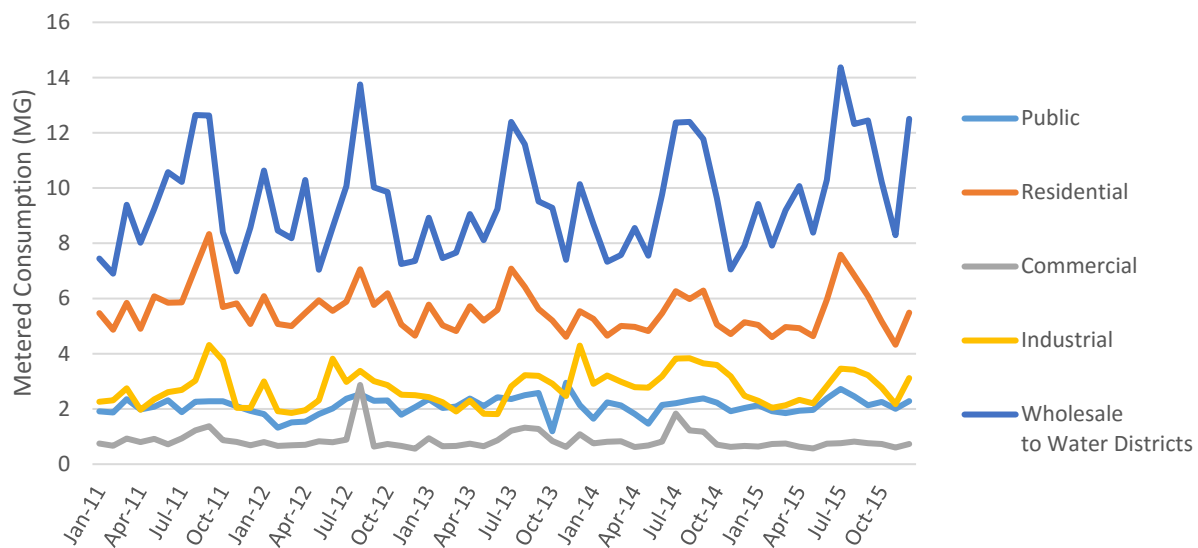
**Exhibit 2-10. Percent Annual Water Use by Customer Category, 2015.**



## Monthly Consumption

As shown in **Exhibit 2-11**, water use by the wholesale, residential and industrial customer categories from 2011 through 2015 increased during the summer months. This is a typical pattern among many municipal customers that can be attributed to outdoor watering. Wholesale water sales show the largest fluctuation between winter and summer months, which may be attributable in part to summer tourism in the coastal communities served by the districts. During the summer, occupancy of vacation homes and vacation rentals increases, which in turn, results in increased water consumption. While water use in the commercial and public customer categories shows some of the same seasonal fluctuations, it is less pronounced, which may be due to lower water use for irrigation within these customer categories.

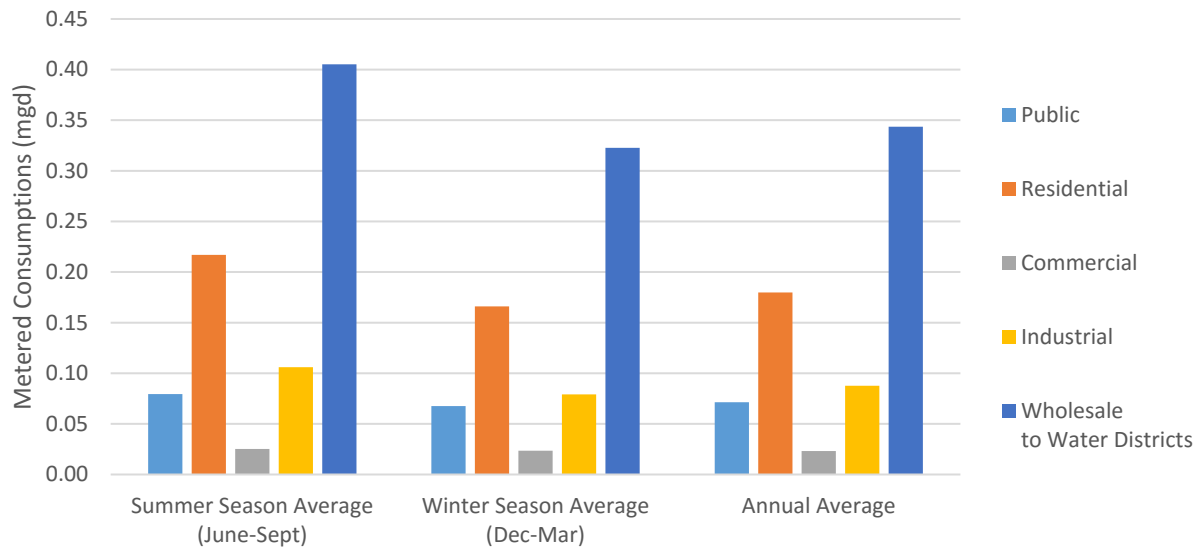
**Exhibit 2-11. Monthly Metered Consumption by Customer Category, 2011-2015.**



## Seasonal Consumption

**Exhibit 2-12** shows the City's average monthly consumption by season and customer category in 2015. The three "largest" customer categories (wholesale, residential and industrial) show the expected increase in use during the summer season, though the increase is modest. The total average daily consumption for the summer months was 0.83 mgd and for the winter months was 0.73 mgd, resulting in a summer season to winter season ratio of approximately 1.26. The summer to winter ratios ranged from 1.07 for the commercial customer category to 1.34 for the industrial customer category. Given the slight increases that appear to be related to irrigation, promoting indoor water conservation measures should be emphasized to a greater degree than outdoor water conservation measures.

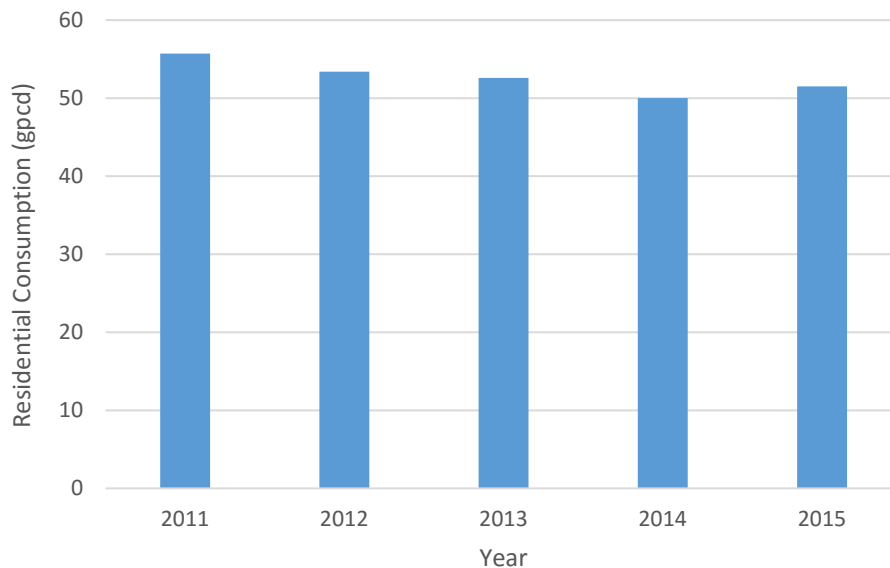
**Exhibit 2-12. Seasonal Water Consumption by Customer Category, 2015.**



## Residential Per Capita Consumption

**Exhibit 2-13** shows the City's residential per capita water consumption data for 2011 through 2015. Residential per capita consumption was calculated from water sales data for the residential billing class and historical population estimates. The City's residential per capita water consumption declined from 2011 through 2014, then increased slightly from 2014 to 2015.

**Exhibit 2-13. Residential Per Capita Consumption, 2011-2015.**



## Water Losses and Non-Revenue Water

*OAR 690-086-0140(9)*

As shown in **Exhibit 2-14**, the City's non-revenue water was 21.9 percent in 2015 and averaged 20.5 percent from 2011 through 2015. The City calculated non-revenue water as the difference between the finished water demand and metered water consumption. Non-revenue water includes unmetered authorized uses (e.g. water used for firefighting and fire department training) and system leakage. A leak, which developed in one of the City's water tanks in May 2014 and has since been repaired, accounts for approximately 3.5 and 5.1 percent of non-revenue water in 2014 and 2015, respectively. The City plans to add meters or estimate currently unmetered authorized uses to better understand how much non-revenue water is actually from system leakage. The City also plans to conduct leak detection surveys. Both of these planned water conservation measures are five-year benchmarks described in Section 3.

Exhibit 2-14. Non-revenue Water, 2011-2015.

Year	Finished Water Demand (MG)	Metered Consumption (MG)	Non-revenue Water (MG)	Non-revenue Water (%)
2011	302.1	249.9	52.2	17.3%
2012	303.6	245.5	58.1	19.1%
2013	319.0	246.8	72.2	22.6%
2014	315.3	247.9	67.4	21.4%
2015	329.9	257.5	72.4	21.9%
Average			64.5	20.5%

## Water Rights

*OAR 690-086-0140(5)*

The City holds six certificated water rights in the Mill Creek watershed. Certificate 905 has a priority date of January 14, 1911 and is for use of up to 5.0 cfs from Mill Creek for domestic use. Certificate 9040 has a priority date of May 15, 1919 and is for use of up to 10.0 cfs from Mill Creek for domestic supply. Certificates 9047 and 9048 have a priority date of December 22, 1924 and are for municipal use. Certificate 9047 authorizes the use of up to 0.75 cfs from an unnamed branch of Mill Creek and Certificate 9048 authorizes the use of up to 0.75 cfs from Mill Creek. Certificates for 2193 and 42194 have a priority date of November 9, 1959 and are for municipal use. Certificate 42193 authorizes the storage of 250.0 acre-feet from Mill Creek and Certificate 42194 authorizes the use of that stored water for municipal purposes.

The City holds four water rights for use of water from the Siletz River. The City holds Permit S-9370, which has a priority date of October 24, 1929 and originally authorized the use of up to 4.0 cfs for municipal supply "including manufacturing and domestic purposes." The City amended Permit S-9370 via Permit Amendment T-7480, which changed the authorized point of diversion and the place of use. The City subsequently partially perfected a 1.34 cfs portion of Permit S-9370, and OWRD issued Certificate 87645 on July 5, 2012, which confirmed this right.

The remaining 2.66 cfs portion of Permit S-9370 is still in permit status. On December 3, 2013, OWRD issued a final order approving an extension of time for Permit S-9370 to October 1, 2040.

The City's Certificate 87645 (described above) and Certificate 14396 have been modified by Transfer T-11451, which changed the authorized point of diversion to a new location approximately 520 feet upstream from the original point of diversion and changed the place of use to "within the service boundaries of the City of Toledo." The water right previously evidenced by Certificate 14396 has a priority date of February 12, 1937 and authorizes the use of up to 1.75 cfs from the Siletz River for municipal use. The completion date for Transfer T-11451 is October 1, 2024.

Permit S-44083 has a priority date of March 23, 1979 and authorizes the use of up to 4.0 cfs for municipal purposes. On December 3, 2013, OWRD issued a Final Order approving an extension of time for Permit S-44083 to October 1, 2055. The City has filed Permit Amendment Application T-11459, which requests to change the authorized point of diversion and place of use for Permit S-44083. This application remains pending with OWRD.

The Final Orders for the extensions of time for Permits S-9370 and S-44083 include conditions that any diversion of water under the extended permits is only authorized upon issuance of a final order approving a WMCP, and that the City is required to submit the WMCP within three years of the December 3, 2013 Final Order. As further described below, the final orders also included conditions to maintain the persistence of listed fish species (fish persistence conditions).

**Exhibit 2-15** provides detailed information about the City's water rights.



Exhibit 2-15. Municipal Water Rights Held by the City of Toledo.

Source	Application	Permit	Transfer or Permit Amendm ent	Certificate	Priority Date	Type of Beneficial Use	Authorized Rate (cfs)	Authorized Date for Completion	Maximum Rate of Withdrawal to Date		2015 Average Withdrawal <sup>1</sup>		Five-Year (2011-2015) Average Withdrawal <sup>1</sup>		Comments
									Instantaneous (cfs)	Annually (MG)	Monthly (MG)	Daily (mgd)	Monthly (MG)	Daily (mgd)	
Mill Creek, tributary of Yaquina River	S-1197	S-709		905	1/14/1911	Domestic Use	5.0		5.0		7.45	0.25	10.47	0.34	Typically not used during summer and fall due to algal blooms that affect water quality. Limited streamflow during summer months.
Mill Creek, tributary of Yaquina River	S-6531	S-4085		9040	5/15/1919	Domestic Supply	10.0		10.0						Typically not used during summer and fall due to algal blooms that affect water quality. Limited streamflow during summer months.
Unnamed branch of Mill Creek, tributary of Yaquina River	S-9958	S-7191		9047	12/22/1924	Municipal	0.75		0.75						Not currently used by the City due to the location of the authorized POD.
Mill Creek, tributary of Yaquina River	S-9959	S-7192		9048	12/22/1924	Municipal	0.75		0.75						Not currently used by the City due to the location of the authorized POD.
Mill Creek, tributary of Yaquina River	R-33458	R-5132		42193	11/9/1959	Municipal	250.0 acre- feet			250.0 acre-feet					
Mill Creek Reservoir constructed under Application R-33458, Permit R-5132	S-33459	S-33124		42194	11/9/1959	Municipal	250.0 acre- feet of stored water only			250.0 acre-feet of stored water only					Typically not used during summer and fall due to algae blooms that affect water quality.
Siletz River, tributary of Siletz Bay, tributary of the Pacific Ocean	S-16771	S-12553	Transfer T-11451	<del>14396</del>	2/12/1937		1.75	10/1/2024	1.75		19.97	0.66	24.40	0.80	Source often not available during winter and spring due to high turbidity.
Siletz River, tributary of the Pacific Ocean	S-9834	S-9370	Transfer T-11451	<del>87645</del>	10/24/1929	Municipal supply, including manufacturing and domestic purposes	1.34	10/1/2024	1.34						Source often not available during winter and spring due to high turbidity.
Siletz River, tributary of the Pacific Ocean	S-9834	S-9370	Permit Amendment T-7480		10/24/1929	Municipal supply, including manufacturing and domestic purposes	2.66	10/1/2040	0	0	0	0	0	0	Conditioned to maintain the persistence of listed fish. Access to water requires a final order approving the City's WMCP. Source often not available during winter and spring due to high turbidity.
Siletz River	S-58445	S-44083	Permit Amendment T-11459 (Pending)		3/23/1979	Municipal	4.0	10/1/2055	0	0	0	0	0	0	Conditioned to maintain the persistence of listed fish. Access to water requires a final order approving the City's WMCP. Source often not available during winter and spring due to high turbidity.

<sup>1</sup> Annual finished water demand was used to calculate these values due to the incomplete diversion records for the Mill Creek live flow water rights.

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## Aquatic Resource Concerns

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.

### *Water Quality*

The Siletz River at the City's point of diversion (POD) at approximately River Mile 40 is 303(d) listed as water quality limited for dissolved oxygen (September 1-June 15), temperature (summer), turbidity, and for flow modification, which does not require a TMDL. Mill Creek is also water quality limited for temperature (October 1-June 15 (spawning) for River Mile 0 to 1.7; year-round (non-spawning) for River Mile 0 to 4.2. The unnamed branch of Mill Creek was not included in DEQ's 303(d) listing database. The 303(d) listing information was obtained from:

<http://www.deq.state.or.us/wq/assessment/rpt2010/search.asp>

### Listed Streamflow-dependent Species

**Exhibit 2-16** shows the five listed fish species in the Siletz River within the reach of the City's POD at approximately River Mile 40 and within the Mill Creek Watershed.

**Exhibit 2-16. Listed Fish Species in the Siletz River within the Reach of the City's Point of Diversion (~River Mile 40) and the Mill Creek Watershed (tributary of the Yaquina River).**

Species	Evolutionarily Significant Unit (ESU) (if applicable)	Federal Listing	State Listing
Chinook Salmon, Spring run	Coastal Spring Chinook Species Management Unit (SMU); Lower Columbia River ESU	Threatened	Sensitive-Critical
Steelhead	Oregon Coast ESU, (winter and summer runs); Coastal Winter/Summer Steelhead SMU	Threatened	Sensitive-Vulnerable
Coho Salmon	Coastal Coho Salmon SMU/Oregon Coast ESU	Threatened	Sensitive-Vulnerable
Chum Salmon	Coastal Chum Salmon SMU/Pacific Coast ESU	Threatened	Sensitive-Critical
Pacific Lamprey		Petitioned for listing	Sensitive-Vulnerable
Western Brook Lamprey		Petitioned for listing	Sensitive-Vulnerable
Pacific Eulachon			Sensitive-Vulnerable

**Sources:**

ODFW's Division 315 Evaluation of Fish Persistence for Municipal Extension, City of Toledo Application #S-58445/Permit #S-44083. July 8, 2013.

ODFW's Division 315 Evaluation of Fish Persistence for Municipal Extension, City of Toledo Application #S-9834/Permit #S-9370. January 7, 2013.

Federal ESA listed species (T&E), from NOAA Fisheries Office of Protected Resources:

<http://www.nmfs.noaa.gov/pr/species/esa/fish.htm>

West Coast Salmon and Steelhead Listings, from NOAA Fisheries West Coast Region

[http://www.westcoast.fisheries.noaa.gov/protected\\_species/salmon\\_steelhead/salmon\\_and\\_steelhead\\_listings/salmon\\_and\\_steelhead\\_listings.html](http://www.westcoast.fisheries.noaa.gov/protected_species/salmon_steelhead/salmon_and_steelhead_listings/salmon_and_steelhead_listings.html)

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 & Wildlife:

[http://www.dfw.state.or.us/wildlife/diversity/species/threatened\\_endangered\\_candidate\\_list.asp](http://www.dfw.state.or.us/wildlife/diversity/species/threatened_endangered_candidate_list.asp)

Oregon State Sensitive Species, from the Oregon Department of Fish & Wildlife:

[http://www.dfw.state.or.us/wildlife/diversity/species/sensitive\\_species.asp](http://www.dfw.state.or.us/wildlife/diversity/species/sensitive_species.asp)

Federal Species of Concern, from the U.S. Fish & Wildlife Service, Oregon Fish & Wildlife Office:

<http://www.fws.gov/oregonfo/Species/Data/PacificLamprey/default.asp>

### Critical Groundwater Area

The City does not hold a municipal ground water right and the City is not located in a Critical Groundwater Area.

## Evaluation of Water Rights/Supply

*OAR 690-086-0140(3)*

### **Mill Creek Watershed**

The reliability of the City's surface water rights in the Mill Creek watershed is influenced by water quality and streamflows. These water rights are not reliable in the summer and fall months. Certificates 905, 9040, and 42194 are typically not used during the summer and fall due to water quality issues resulting from algal blooms in the Mill Creek Reservoir. (The City's diverts water from the Mill Creek watershed using an intake on the Mill Creek Reservoir.) In addition, reduced stream flows during the summer months affect water availability under Certificates 905 and 9040. Certificates 9047 and 9048 are currently not used due to the location of the point of diversion.

### **Siletz River**

The City uses its surface water rights on the Siletz River to meet its municipal demands during the summer (peak season) and fall months when the Mill Creek watershed does not provide a reliable water supply. The reliability of the City's water rights to appropriate water from the Siletz River is a function of water right priority date (seniority), permit conditions and streamflows, as well as water quality.

The City's water rights are regulated under the prior appropriation system. When streamflows are insufficient to meet the needs of all water rights, the "junior" (newer) water rights may be curtailed or regulated off to serve the senior (older) water rights' needs. This regulation applies to instream rights as well as out of stream appropriations. Two instream water rights (evidenced by Certificates 67712 and 67713) protect water instream from RM 42.6 to the mouth of the Siletz River, a reach that includes the City's point of diversion on the Siletz River (RM 40). Certificate 67712 has a priority date of July 12, 1966 and protects instream flows at rates ranging from 100 cfs (during July through September) to 200 cfs (from mid-October through May). Certificate 67713 has a priority date of March 26, 1974 and protects water instream at rates ranging from 100 cfs (July through September) to 220 cfs (during November and December). These instream water rights are frequently not met, particularly in the peak season. From 2000 through 2016, 18 percent of the years had one month during which the instream water rights were not met at all. Months during which the instream water rights were not met 100 percent of the time were August, September, and October. September had the highest percentage of days missed with 70 percent. In 2015, these instream water rights were not met 94 percent of the days in August, 87 percent of the days in September, and 77 percent of the days in October. All of the City's water rights from the Siletz River, except Permit S-44083 (which has a priority date of March 23, 1979), are senior in priority to these instream water rights and, therefore, cannot be regulated in favor of the instream water rights. (Wholesale customer SRWD holds Permit S-40277 for municipal use of water from the Siletz River. Permit S-40277 has a priority date of February 28, 1973, which is junior in priority date to instream water right certificate 67712).

Thus, the City's water rights currently evidenced by Transfer T-11451 (previously evidenced by Certificates 87645 and 14396) are senior in priority to the instream water rights, and are expected to be reliable during the summer and fall months when the City relies on its Siletz River rights.

The City's Permit S-44083 is junior in priority to the instream water rights in the Siletz River, and is expected to be not available when streamflows are less than the flows protected by the instream water rights. As previously described, the instream flows are frequently not met, particularly in the fall.

Finally, the reliability of both Permit S-44083 and Permit 9370 will be affected by permit extension conditions. As part of the municipal permit extension process for these permits, the Oregon Department of Fish and Wildlife (ODFW) recommended to OWRD that the extension of time contain conditions intended to "maintain the persistence of listed fish" in the Siletz River. Consequently, the Final Orders issued by OWRD on December 3, 2013 approving the extensions of time for the permits contain "fish persistence" conditions, which include the target flows on the Siletz River shown in **Exhibit 2-17**. If the target flows are not met, use of water under Permit S-9370 and Permit S-44083 would be reduced in proportion to the amount by which the target flow is missed (based on a seven-day rolling average of mean daily flows).<sup>2</sup> It should be noted that the target flows are as high, or higher, than the flows protected by the instream water rights in the Siletz River (evidenced by Certificates 67712 and 67713). From 2000 through 2016, 47 percent of the years had at least one month during which target flows were not met at all. Months during which target flows were not met 100 percent of the time were July, August, September, and October. September had the highest percentage of days missed with 78 percent.

**Exhibit 2-17. Target Flows for Fish Persistence in the Siletz River, Measured at U.S. Geological Survey (USGS) Gage 14305500 at Siletz, Oregon.**

Time Period	Target Flows (cfs)
January-May	200
June	135
July	180
August	112
September	114
October 1-October 15	150
October 16-October 31	220
November-December	220

## System Description

### *OAR 690-086-140(1)(8)*

The City operates a public drinking water system (Public Water System Identification Number is 4100899). The City's water sources for its municipal water distribution system are the Mill Creek watershed and the Siletz River.

The City diverts its water supply from the Mill Creek watershed via an intake at the Mill Creek Reservoir. Water from the reservoir is conveyed approximately 3.4 miles to the Mill Creek Raw Water Pump Station and then boosted 1.9 miles to the City's WTP. The City's intake on the Siletz River is at approximately River Mile 40. Water is conveyed through a

<sup>2</sup> Although the fish persistence conditions apply to only the "undeveloped portion of the permits," the entire rate under Permits S-9370 and S-44083 would be considered "undeveloped" because the City has not used water under these permits.

raw water transmission pipeline approximately 6 miles from the intake to the City's WTP.

The Mill Creek Dam, which impounds Mill Creek Reservoir, is a concrete-core earthen dam that was completed in 1967. The dam is approximately 65 feet tall from the original stream channel bottom and 265 feet long the top. The permitted storage amount in the reservoir is 250 acre-feet with approximately 15 acres of surface area. The water surface elevation in the reservoir is approximately 145 feet above sea level.

The City's WTP was built in 1976 with costs covered by the City of Toledo and SRWD. The instrumentation and controls system, individual filter effluent turbidimeters, new filter media, and other minor improvements were installed in 1999. The original design capacity of the plant was 3.0 mgd (4.64 cfs, 2080 gpm), but due to current water treatment standards, the plant typically operates in the range of 850 to 1300 gpm (1.89 cfs to 2.89 cfs). The City currently has three finished water reservoirs in service with a total capacity of 3.35 MG. The WTP clearwell also provides some storage, but its primary function is to provide chlorine contact time regardless of water demand. Consequently, water depth in the clearwell must remain above a certain point to maintain sufficient contact time so the entire 0.85 MG volume cannot be utilized for storage. The City also has 4 booster pump stations and 35.4 miles of pipelines in its water transmission and distribution system, as described in **Exhibits 2-18, 2-19, and 2-20**. **Exhibit 2-1** shows a schematic of the City's existing water distribution system.

**Exhibit 2-18. Summary of System Reservoirs.**

Reservoir	Volume (MG)	Material	Overflow Elevation (feet)	Construction Date	Comment
Skyline Drive Storage Tank	1.9	Steel	398	2014	
Ammon Road Storage Tank	1.0	Painted Steel	300	1970s	
Graham Street Storage Tank	0.45	Steel	240	1968	
Total	3.35				

**Exhibit 2-19. Summary of Existing Pump Stations.**

Name	Location	# Pumps	Capacity (gpm)
Skyline Drive Booster Pump Station	Skyline Drive	2	50
Wagon Road Booster Pump Station	Wagon Road	2	400-500/pump
Mill Creek Pump Station	Near SE 18 <sup>th</sup> St	2	790 gpm together; up to 425 gpm individually
Siletz River Pump Station	Point of Diversion	3	1200*

\*One pump has a capacity of 1200 gpm, and the capacity of that pump plus either of the remaining two pumps can easily convey current and future peak demands to the WTP.

Exhibit 2-20. Summary of Pipeline Sizes.

Pipe Diameter (in)	Total Length (ft)	Total Length (mi)	Percent of Total Pipeline (%)
4" Finished	13,000	2.46	7%
6" Finished	65,500	12.41	35%
8" Finished	21,650	4.10	12%
10" Finished	14,080	2.67	8%
12" Finished	7,820	1.48	4%
18" Finished	2,630	0.50	1%
8" Raw	1,200	0.23	1%
12" Raw	29,580	5.60	16%
14" Raw	10,250	1.94	5%
16" Raw	2,100	0.40	1%
18" Raw	19,075	3.61	10%
Total	186,885	35.39	100%



## SECTION 3

# Water Management and Conservation

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*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.*

## Current Conservation Measures

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

### Progress Report

This is the City's first WMCP.

### Background

The City's water conservation efforts have primarily focused on: implementing a rate structure that encourages water conservation; showing past water use on water bills; replacing all 2-inch and smaller residential, commercial, and industrial meters with touch-read meters; and conducting its leak detection program.

## Use and Reporting Program

**OAR 690-086-0150(2)**

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/](http://apps.wrd.state.or.us/apps/wr/wateruse_report/).

The City has magnetic flow meters to measure the raw water diversions on the Siletz River (installed in 2016) and finished water leaving the WTP to serve the water distribution system.

## 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:

- Annual water audit
- System-wide metering
- Meter testing and maintenance
- Unit-based billing
- Leak detection and repair (if system leakage exceeds 10 percent)
- Public education

## Five-Year Benchmarks for Required Conservation Measures

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

### 1. Annual Water Audit

OWRD defines a water audit as an analysis of a 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, metered or estimated. The water audit also includes analysis of the water supplier's own water use.

The City's systematic and documented annual water audit revealed that the City's non-revenue water was 21.9 percent in 2015 and averaged 20.5 percent from 2011 through 2015. The City calculated non-revenue water as the difference between the finished water demand and metered water consumption. Non-revenue water includes unmetered authorized uses (e.g. hydrant flushing and water used for firefighting and fire department training) and system leakage. (The City's also estimated that a tank leaked approximately 2.4 MG and 3.7 MG in 2014 and 2015, respectively. The leak has been fixed.) The City plans to add meters or estimate currently unmetered authorized uses, such as the bulk water station, to improve its water auditing.

*Five-Year Benchmarks:* In the next five years, the City will continue to conduct annual water audits. In the next two years, the City will install meters and/or develop methods to estimate unmetered authorized uses.

### 2. System-wide Metering

The City's finished water system is fully metered, with the exception of the bulk water station at the Public Works yard. Currently, bulk water consumption is estimated based on receipts. Customers pay ahead of time for the water that they plan to take at the bulk water station, receive a ticket stating the amount of water purchased, take the ticket to the Public Works yard, and receive the water. However, the bulk water station is also used by the Fire Department for training, and consumption for that purpose is not estimated. The City requires meters on all new connections.

*Five-Year Benchmarks:* The City will continue to require meters on all new connections. In the next two years, the City will install a meter at the bulk water station.

### 3. Meter Testing and Maintenance

The City tests meters over 2 inches annually, which comprises approximately 10 meters for the entire city. The City has an automated meter reading (AMR) system installed on smaller meters. The City began installing AMR in 1995 and completed installation several years later. For each account, billing staff compares the consumption in the current month to consumption in the previous month to look for abnormalities in water consumption that could indicate a failing meter or a leak. Should an anomaly appear, billing staff will request further review and/or field staff will re-read the meter with the abnormal reading. AMR enables the City to monitor

daily consumption of a given account if the City desires more information, as well. Field staff are also able to flag potential usage issues if/when they notice something that may be out of the ordinary, but most metering issues are typically noticed by the billing staff as they have more direct access to previous readings. Meters less than 2 inches are repaired or replaced as needed.

*Five-Year Benchmarks:* The City will continue to test meters over 2 inches annually and monitor smaller meters on a monthly basis.

#### 4. Water Rate Structure

City water customers have a monthly service rate based on meter size and a consumption rate based on the quantity of water metered at the service connection.

**Exhibit 3-1** presents the City's current service and consumption rates.

Exhibit 3-1. Monthly Service and Consumption Rates as of May 21, 2016.

Meter Size (inches)	In-City		Outside City	
	Service Rate (\$)	Consumption Rate	Service Rate (\$)	Consumption Rate
5/8	\$28.40	\$4.45/ 1,000 gallons	\$56.80	\$8.90/ 1,000 gallons
3/4	\$40.00		\$80.00	
1	\$65.45		\$130.90	
1.25	\$100.20		\$200.40	
1.5	\$141.85		\$283.70	
2	\$248.35		\$496.70	
3	\$551.60		\$1,103.20	
4	\$975.25		\$1,950.50	
6	\$2,188.30		\$4,376.59	
8	\$3,882.90		\$7,765.80	
10	\$6,047.40		\$12,094.80	
12	\$8,732.80		\$17,465.60	

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

#### 5. Leak Detection and Repair

If annual water audits indicates that system leakage exceeds 10 percent, a city is required to have a regularly scheduled and systematic leak detection program. The City's non-revenue water was 21.9 percent in 2015 and averaged 20.5 percent from 2011 through 2015.

The City has a regularly scheduled and systematic leak detection and repair program. The City regularly conducts visual inspections above waterlines to detect pooling that indicates leaks and uses its AMR system to flag and then investigate, changes in meter readings that suggest a leak. When a leak is discovered by City

staff or reported by a customer, the City promptly addresses and repairs the leak. The City also has leak detection equipment that is used as needed.

The City also monitors for leaks in Siletz River and Mill Creek watershed raw water systems. The City is able to quickly identify potential leaks in the Siletz River raw water transmission line or valve issues by comparing the rate that raw water enters the WTP to the operational pumping rate at the Siletz River. The City has not found leaks in the Siletz River raw water transmission line, but has had valves fail at the intake, which the City promptly repaired. The City has been finding and repairing leaks in the Mill Creek watershed raw water transmission line. The 2017 Draft WSMP has identified replacement of the Mill Creek pump station and raw water transmission piping, as well as refurbishment of the Ammon Road and Graham Street storage tanks, as recommended projects in the 20-year planning period of the City's Capital Improvement Plan.

*Five-Year Benchmarks:* The City will continue regular visual inspections of its waterlines and tracking of leaks using AMR, as well as prompt repair of any detected leaks. If adding meters and/or estimating currently unmetered authorized uses do not reduce the City's non-revenue water below 15 percent based on two years of data, then the City will begin conducting a systematic leak detection survey using its leak detection equipment within one year of that determination. In the next five years, the City will pursue replacement and refurbishment of components of the Mill Creek raw water supply system as budget allows.

## **6. Public Education**

The City's water conservation public education program currently consists of showing past water use on water bills and occasionally including water conservation messages in its newsletter, such as information about leak detection.

*Five-Year Benchmarks:* In the next five years, the City will add water conservation content to its website. In the next five years, the City will obtain water conservation brochures from a water conservation organization and add website content about indoor and outdoor water conservation. In the next five years, the City will begin promoting water conservation at one community event each year, for example at the weekly outdoor farmer's market. In the next five years, the City will begin including an insert about water conservation in water bills at the beginning of summer and one other time during the year. In the next year, the City will provide water conservation messages in its newsletter at least twice per year.

## **Expanded Use under Extended Permits**

### ***OAR 690-086-0150(5)***

Under OAR 690-086-0150(5), any municipal water supplier that proposes to expand or initiate the diversion of water under an extended permit for which resource issues have been identified shall include a description of activities and five-year implementation schedule for a system-wide leak repair or line replacement program to reduce system leakage to no more than 15 percent. The City is proposing to initiate diversion of water under extended permit S-9370 (modified by Permit Amendment T-7480) and extended permit S-44083; therefore, this rule applies.

As described above, the City has a regularly scheduled and systematic leak detection and repair program that includes: regular visual inspections of water lines, use of its AMR system to flag then investigate changes in meter readings that suggest a leak, promptly addressing and repairing any discovered leaks, and using leak detection equipment as needed.

The City's systematic and documented annual water audit revealed that the City's non-revenue water was 21.9 percent in 2015 and averaged 20.5 percent from 2011 through 2015. In the next two years, the City plans to add meters or estimate currently unmetered authorized uses (such as at the bulk water station). If adding meters and/or estimating currently unmetered authorized uses do not reduce the City's non-revenue water below 15 percent based on two years of data, then the City will begin conducting a systematic leak detection survey using its leak detection equipment within one year of that determination. In addition, the City will continue regular visual inspections of its waterlines and looking for leaks using AMR, as well as prompt repair of any detected leaks.

As described in greater detail above, the City also monitors for leaks in Siletz River and Mill Creek watershed raw water systems. The City has not found leaks in the Siletz River raw water transmission line. The City has been finding and repairing leaks in the Mill Creek watershed raw water transmission line, and the 2017 Draft WSMP has recommended several projects to address leakage in the City's Capital Improvement Plan. The City plans to pursue replacement and refurbishment of components of the Mill Creek raw water supply system as budget allows.

## Additional Conservation Measures

### *OAR 690-086-0150(6)*

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. The City is proposing to initiate diversion of water under extended permit S-9370 and extended permit S-44083. Also, the City's water service area population plus the population of SRWD was 7,853 in 2015. Therefore, the City is required to address the following additional conservation measures.

#### **1. Leak Repair or Line Replacement Program**

Under this rule requirement, the City is required to implement a system-wide leak repair program or line replacement program to reduce system leakage to 15 percent, and if feasible to 10 percent.

For the City's current leak detection and repair program, the City regularly conducts visual inspections of water lines, uses its AMR system to flag potential leaks, promptly addresses and repairs the leak, and uses leak detection equipment as needed. The City has not yet developed an official prioritized list of waterline replacement projects. However, the City's smaller, older waterlines are considered to be "high-priority," and thus, currently have first priority for replacement.

The City's non-revenue water was 21.9 percent in 2015 and averaged 20.5 percent from 2011 through 2015. In the next two years, the City plans to add meters or

estimate currently unmetered authorized uses (such as at the bulk water station) to determine whether those actions reduce non-revenue water below 15 percent (a Water Audit benchmark).

As previously described, the City also monitors for leaks in Siletz River and Mill Creek watershed raw water systems. The City has not found leaks in the Siletz River raw water transmission line. The City has been finding and repairing leaks in the Mill Creek watershed raw water transmission line, and the 2017 Draft WSMP has recommended several projects to address leakage in the City's Capital Improvement Plan.

*Five-Year Benchmarks:* The City will continue regular visual inspections of its waterlines and tracking of leaks using AMR, as well as prompt repair of any detected leaks. If adding meters and/or estimating currently unmetered authorized uses do not reduce the City's non-revenue water below 15 percent based on two years of data, then the City will begin conducting a systematic leak detection survey using its leak detection equipment within one year of that determination. In the next five years, the City will continue to replace "high-priority" waterlines as budget allows. In the next five years, the City will pursue replacement and refurbishment of components of the Mill Creek raw water supply system as budget allows.

## **2. Technical and Financial Assistance Programs**

The City currently does not have a technical or financial assistance program to encourage water conservation. However, the City does adjust water bills of customers who promptly fix leaks. As described in Section 2, the City has low residential per capita consumption and residential consumption only makes up 26 percent of total consumption. Thus, the City may achieve greater conservation savings by targeting other customer categories.

*Five-Year Benchmarks:* The City will continue to adjust a customer's water bill when the customer promptly repairs a discovered leak. In the next five years, the City will make brochures and add information to the City website about leak detection in the home and office, as well as conserving water when irrigating. In the next five years, the City will meet with the five industrial and/or commercial customers with the highest consumption to discuss opportunities to conserve water and potential funding sources.

## **3. Supplier Financed Retrofit or Replacement of Inefficient Fixtures**

The City currently does not help finance the retrofit or replacement of inefficient fixtures. Central Lincoln Public Utility District used to offer free showerheads, but that program recently expired.

*Five-Year Benchmarks:* In the next five years, the City will offer customers free water-efficient showerheads and faucet aerators, which will be available at the City's billing office. The City will advertise these free fixtures on its website and in customer water bills. In the next five years, the City will review water fixtures in City buildings and parks, create a prioritized list for retrofitting or replacing inefficient fixtures, and carry out retrofits and replacements as funding becomes available.

**4. Rate Structure and Billing Practices that Encourage Conservation**

The City customers are billed monthly, providing customers with timely feedback on water consumption and associated costs. Water bills also show consumption during the same billing for the previous year, so customers can see whether consumption has increased or decreased compared to the same period in the previous year. Although the volume of consumption for the previous month is not shown in water bills, the amount paid during the previous month is shown and can be compared to the current month to provide a sense of change in water consumption.

*Five-Year Benchmarks:* The City will continue to bill customers monthly and based on the quantity of water metered at the service connection. The City will continue to show consumption during the same billing period for the previous year for comparison purposes. In the next five years, the City will begin including an insert about water conservation in water bills at the beginning of summer and one other time during the year.

**5. Water Reuse, Recycling, and Non-potable Water Opportunities**

The City currently does not have any water reuse, recycling, or non-potable projects.

*Five-Year Benchmarks:* In the next five years, the City will identify and investigate two potential water reuse, recycling, and non-potable water opportunities.

**6. Other Conservation Measures**

City staff is a member of the American Public Works Association, which addresses water conservation issues.

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## SECTION 4

# Water Curtailment

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*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.*

## Introduction

Water curtailment plans outline proactive measures that water suppliers may take to reduce demand during short-term water supply shortages. The intent of water curtailment plans is to minimize the impacts of water supply shortages, which may result from incidents such as: mechanical or electrical equipment failure in the system, unanticipated 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.

## History of System Curtailment Episodes

### *OAR-690-086-0160(1)*

In the past 10 years, the City has not needed to implement water curtailment measures. The City's current capacity limitation is the rate that the City can currently access under its water rights. The City's storage and water treatment plant capacity exceed the rate that the City is currently authorized to put to beneficially use under its water rights. In long-term drought, the reliability of both Permit S-44083 and Permit 9370 will be affected by fish persistence conditions. If the target flows are not met, which occurs frequently and particularly in the fall, use of water under Permit S-9370 and Permit S-44083 would be reduced in proportion to the amount by which the target flow is missed (based on a seven-day rolling average of mean daily flows). It should be noted that the target flows are as high, or higher, than the flows protected by the instream water rights in the Siletz River (evidenced by Certificates 67712 and 67713). The City's Permit S-44083 is junior in priority to the instream water rights in the Siletz River, and is expected be regulated off when streamflows are less than the flows protected by the instream water rights. In the event of other source shortages, such as a natural disaster or source contamination, the City's ability to maintain delivery will be dependent upon the City's storage capacity (3.35 MG, which can supply the City's ADD for approximately 3.7 days (not accounting for fire flows)) if both water sources are affected or if the water source currently in use is affected and will be dependent upon the City's water rights if the water source currently in use is not affected.

## Curtailment Event Triggers and Stages

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

The City developed this curtailment plan to describe the standards and procedures that will be employed in the event of a water shortage that requires the City's to implement a water curtailment stage.

Situations that could create a water supply shortage include, but are not limited to:

- a) fire, earthquake, or windstorm damage to water system infrastructure
- b) water system infrastructure or facility failure
- c) contamination in the Siletz River or Mill Creek watersheds
- d) drought

The City has adopted a four-stage curtailment plan to be invoked in the event of a water supply shortage. 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, and anticipated duration of the shortage.

**Exhibit 4-1** presents the four curtailment stages, as well as their initiating conditions (i.e. triggers). Initiation of a curtailment stage is based on judgment and the specific circumstances of the actual event. The City's initiating conditions focus on reservoir water levels, damage that the water system may incur, issues with components of the water system, water supply contamination, and weather conditions.

Exhibit 4-1. Curtailment Stages 1 through 4.

Curtailment Stages	Potential Initiating Conditions
<b>Stage 1: Water Supply Shortage Warning</b>	<ul style="list-style-type: none"> <li>• The maximum daily production of the water treatment plant does not meet daily demand.</li> <li>• There is expectation of a potential water supply deficiency.</li> </ul>
<b>Stage 2: Moderate Water Supply Shortage</b>	<ul style="list-style-type: none"> <li>• Maximum daily production of the water treatment plant does not meet daily demand and water storage reservoirs fall to 80 percent of capacity.</li> <li>• Minor damage to the water system due to a natural disaster, fire, or criminal act.</li> <li>• Failure of a minor part of the water system or facility.</li> </ul>
<b>Stage 3: Severe Water Supply Shortage</b>	<ul style="list-style-type: none"> <li>• Maximum daily production of the water treatment plant does not meet daily demand and water storage reservoirs fall to 70 percent of capacity.</li> <li>• Serious damage to the water system due to a natural disaster, fire, or criminal act.</li> <li>• Failure of a significant part of the water system or facility.</li> <li>• Isolated contamination of the water supply.</li> <li>• Severe drought.</li> </ul>
<b>Stage 4: Critical Water Supply Shortage</b>	<ul style="list-style-type: none"> <li>• Maximum daily production of the water treatment plant does not meet daily demand and water storage reservoirs fall to 60 percent of capacity.</li> <li>• Major damage to the water system due to a natural disaster, fire, or criminal act.</li> <li>• Failure of a critical part of the water system or facility.</li> <li>• Major contamination of the water supply.</li> </ul>

## Authority, Penalties, and Enforcement

The City Manager has the authority to declare and to end water curtailment stages. In addition, the City Manager has the authority to grant temporary variances for prospective uses of water otherwise prohibited and to revise or revoke any variances or adjustments to prohibited water uses.

The City will enforce penalties, which may include issuing warnings, fines, installation of a flow restrictor to the service connection, and disconnection of water service. City Code 13.12.390 “Discontinuance of service— Service detrimental to others” states that the City water utility may refuse to furnish water and may discontinue service to any premises where excessive demands by one customer will result in inadequate service to others. (Ord. 1093 § 39, 1980)

## Communication

The City will communicate stages of curtailment and the associated voluntary and/or mandatory conservation measures through its website and a formal press release to the local newspaper, local radio stations, the Chamber of Commerce, and/or several other organizations included in typical press releases. The City will also communicate directly with contacts at SRWD, so that the district can initiate its own water curtailment protocols. The communications will include a statement describing the current water situation, the reason for the requested voluntary and/or mandatory water curtailment measures, and as applicable, a warning that mandatory water curtailment will be required if voluntary actions do not sufficiently reduce water use. In addition, the City will call its largest commercial and industrial customers to notify them of the impending or immediate activation of curtailment stages, so that they can prepare.

## Curtailment Plan Implementation

*OAR-690-086-0160(4)*

### *Stage 1: Water Supply Shortage Warning*

Stage 1 is activated when the maximum daily production of the WTP does not meet daily demand or there is expectation of a potential water supply deficiency. Under Stage 1, the City will ask City customers to voluntarily decrease indoor and outdoor water use by 10 percent, as well as to postpone new plantings. Suggestions to decrease water use may include but are not limited to: reducing outdoor watering, postponing washing outdoor surfaces (e.g. sidewalks, parking lots, driveways, and buildings), and looking for and fixing any indoor leaks (e.g. toilets and faucets).

### *Stage 2: Moderate Water Supply Shortage*

Stage 2 is activated when maximum daily production of the WTP does not meet daily demand and water storage reservoirs fall to 80 percent of capacity; minor damage to the water system occurs due to a natural disaster, fire, or criminal act; failure of a minor part of the water system or facility occurs; or when the area is experiencing a prolonged period of hot, dry weather. Under Stage 2, the City will promote more significant voluntary water use reductions and some mandatory water use reductions.

The City will ask customers to take one or more of the following voluntary actions to curtail water use:

- Cease washing vehicles, except at a commercial washing facility
- Cease washing outdoor surfaces
- Cease filling swimming pools (except pools with recycling water systems and evaporative covers, pools used for fire control, and pools required by a medical doctor's prescription)
- Cease using water to maintain water features, except those supporting fish life
- Reduce indoor water use by fixing any indoor leaks
- Reduce non-essential water use in commercial/industrial establishments

The City may inform customers of the following mandatory action to curtail water use:

- Restrict watering lawns, ornamental/landscaping plants, and vegetable gardens to 3 days per week and only before 9 am or after 9 pm

The City will implement the same curtailment actions as requested of City customers.

### ***Stage 3: Severe Water Supply Shortage***

Stage 3 is activated when maximum daily production of the WTP does not meet daily demand and water storage reservoirs fall to 70 percent of capacity; serious damage to the water system occurs due to a natural disaster, fire, or criminal act; failure of a significant part of the water system or facilities occurs; an isolated part of the water supply is contaminated; and/or the area is experiencing a severe drought. Under Stage 3, voluntary water use reduction actions in Stage 2 will become mandatory and the City will implement additional mandatory water use reductions.

The City will require that customers implement one or more of the following mandatory actions to curtail water use:

- No watering of lawns, but customers may hand-irrigate ornamental/landscaping plants and vegetable gardens before 9 am or after 9 pm
- No planting of new lawns
- Cease washing vehicles, except at a commercial washing facility
- Cease washing outdoor surfaces (e.g. sidewalks, parking lots, driveways, and buildings)
- Cease filling swimming pools (except pools with recycling water systems and evaporative covers, pools used for fire control, and pools required by a medical doctor's prescription)
- Cease using water to maintain water features, except those supporting fish life
- Cease using water for dust control
- Cease non-essential water use in commercial/industrial establishments
- No allowing water to run to waste in any gutter or drain

The City will implement the same curtailment actions as required of City customers. In addition, the City will limit hydrant and water main flushing to emergencies.

### ***Stage 4: Critical Water Supply Shortage***

Stage 4 is activated when maximum daily production of the WTP does not meet daily demand and water storage reservoirs fall to 50 percent of capacity; major damage to the

water system occurs due to a natural disaster, fire, or criminal act; failure of a critical part of the water system or facility occurs; and major contamination of the water supply, including, for example, a contamination event precluding the use of the Siletz River for a prolonged period of time during the peak demand season. Under Stage 4, the City will require that customers implement one or more of the following mandatory actions to curtail water use:

- Restrict indoor water use to only water uses essential for public health and safety
- Cease outdoor watering
- Cease water use in commercial/industrial establishments except for critical functions, such as fire protection

The City will implement the same curtailment actions as required of City customers.

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## SECTION 5

# Water Supply

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*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.*

## Delineation of Service Areas

### OAR 690-086-0170(1)

**Exhibit 2-1** shows the City's future water service area, which is the area within the UGB.

## Population Projections

### OAR 690-086-0170(1)

During the 20-year planning period of this WMCP, the City plans to serve the population within its current and future water service area plus the population of wholesale customers SRWD and Wright Creek Water District. As described in its approved WMCP, SRWD currently relies exclusively on supply from the Siletz River. SRWD's water right (Permit S-40277) is junior in priority to the instream water right evidenced by Certificate 67712, which has a priority date of July 12, 1966. Consequently, SRWD relies on City water rights during the peak season when streamflows are low and instream Certificate 67712 is not met. The City is aware that SRWD plans to eventually use Beaver Creek as its primary water source under Permit S-55012, however, substantial effort (including financing and permits) will be required before the district can begin construction of an intake and related infrastructure on Beaver Creek. Therefore, the City expects SRWD will not initiate water use from Beaver Creek for several years. Moreover, it is the City's understanding that SRWD intends to retain its connection to the City and will continue to rely on water from the Siletz River to provide a redundant source of supply. The Wright Creek Water District population is unknown and the district is not platted for any large-scale expansion, so a population projection has not been completed. Wright Creek Water District population growth that may occur is incorporated in the population projections and the district's demand is incorporated in the demand projections.

According to the City's 2017 Draft WSMP, the City's total water service area population (including SRWD) is projected to be 10,436 in 2026 and 11,779 in 2036, as shown in **Exhibit 5-1**. The total water service area population was projected by applying a 0.7 percent average annual growth rate to the City's 2015 estimated population and a 1.5 percent average annual growth rate to SRWD's current estimated peak summer season population (5,661), and then summing the City's and SRWD's projected populations for a given year. The City's average annual growth rate of 0.7 percent comes from the 2017 Draft WSMP, which based the percentage on the City's average annual growth rate from 1970 through 2010 of 0.52 percent for Lincoln County (Oregon Office of Economic Analysis) increased slightly to account for

the population served outside of city limits but within the UGB, any population growth that may occur in the Wright Creek Water District, and to fall closer in line with the growth that the City anticipates. The City recognizes that the growth rate of 0.7 percent is greater than the average annual growth rate from 2010 through 2016 of 0.12 percent, but chose to use a slightly higher growth rate for the reasons mentioned above, and more specifically, to meet anticipated demand assuming that there will not be an economic downturn as significant as that experienced nationwide beginning in 2008 and continuing until just recently. The particularly low average annual growth rate from 2010 through 2016 is a reflection of that nationwide economic downturn and the slow recovery. The SRWD average annual growth rate is based on the best-fit model for average annual growth rate increase from 1997 through 2007 of 1.5 percent, as described in SRWD's 2014 WMCP.

Exhibit 5-1. Projected Population.

Year	Toledo Population (0.7% AAGR, starting in 2015)	SRWD Population (1.5% AAGR)	Total Projected Service Area Population
2017	3,539	5,832	9,371
2018	3,564	5,919	9,483
2019	3,589	6,008	9,597
2020	3,614	6,098	9,712
2021	3,639	6,190	9,829
2022	3,665	6,282	9,947
2023	3,690	6,377	10,067
2024	3,716	6,472	10,188
2025	3,742	6,569	10,311
<b>2026</b>	<b>3,768</b>	<b>6,668</b>	<b>10,436</b>
2027	3,795	6,768	10,563
2028	3,821	6,869	10,691
2029	3,848	6,972	10,820
2030	3,875	7,077	10,952
2031	3,902	7,183	11,085
2032	3,929	7,291	11,220
2033	3,957	7,400	11,357
2034	3,985	7,511	11,496
2035	4,012	7,624	11,636
<b>2036</b>	<b>4,041</b>	<b>7,738</b>	<b>11,779</b>



## Demand Forecast

### OAR 690-086-0170(3)

The demand projections for the City's water service area plus wholesale customers are based on the per capita estimation method used in the City's 2017 Draft WSMP. To project the City's total MDD, the City:

1. Determined the ADD per capita of 99 gpcd based on the total (City and SRWD) annual population and annual demand for 2015. (By using annual demand, the ADD incorporates the Wright Creek Water District demand.)
2. Multiplied the ADD per capita of 99 gpcd by the total projected population, beginning in 2016.
3. Multiplied the projected ADD by a peaking factor of 1.9, which was the peaking factor (MDD: ADD) in 2015.

Using this method, the peak demand by the City and SRWD for municipal use is projected to be 3.03 cfs in 2026 and 3.42 cfs in 2036, as shown in **Exhibit 5-2**.

Exhibit 5-2. Projected Demand.

Year	Total Population (Toledo + SRWD)	Total Annual Demand (MG)	Total Demand per Capita (gpcd)	Total ADD (gpd)	Total MDD (gpd)	Total ADD (mgd)	Total MDD (mgd)	Total MDD (cfs)
2017	9,371	338.6	99	927,700	1,759,201	0.93	1.76	2.72
2018	9,483	342.7	99	938,813	1,780,274	0.94	1.78	2.75
2019	9,597	346.8	99	950,073	1,801,626	0.95	1.80	2.79
2020	9,712	350.9	99	961,481	1,823,260	0.96	1.82	2.82
2021	9,829	355.2	99	973,041	1,845,182	0.97	1.85	2.85
2022	9,947	359.4	99	984,755	1,867,394	0.98	1.87	2.89
2023	10,067	363.8	99	996,624	1,889,901	1.00	1.89	2.92
2024	10,188	368.2	99	1,008,650	1,912,707	1.01	1.91	2.96
2025	10,311	372.6	99	1,020,837	1,935,817	1.02	1.94	2.99
<b>2026</b>	<b>10,436</b>	<b>377.1</b>	<b>99</b>	<b>1,033,186</b>	<b>1,959,234</b>	<b>1.03</b>	<b>1.96</b>	<b>3.03</b>
2027	10,563	381.7	99	1,045,699	1,982,963	1.05	1.98	3.07
2028	10,691	386.3	99	1,058,379	2,007,008	1.06	2.01	3.10
2029	10,820	391.0	99	1,071,228	2,031,374	1.07	2.03	3.14
2030	10,952	395.8	99	1,084,249	2,056,065	1.08	2.06	3.18
2031	11,085	400.6	99	1,097,444	2,081,087	1.10	2.08	3.22
2032	11,220	405.4	99	1,110,815	2,106,442	1.11	2.11	3.26
2033	11,357	410.4	99	1,124,365	2,132,138	1.12	2.13	3.30
2034	11,496	415.4	99	1,138,097	2,158,177	1.14	2.16	3.34
2035	11,636	420.5	99	1,152,013	2,184,565	1.15	2.18	3.38
<b>2036</b>	<b>11,779</b>	<b>425.6</b>	<b>99</b>	<b>1,166,115</b>	<b>2,211,307</b>	<b>1.17</b>	<b>2.21</b>	<b>3.42</b>

In addition to meeting its typical municipal demands, the City must also be prepared to meet the water demands of the Georgia Pacific industrial facility when it is unable to obtain water from its own water supply. Based on such an event in September 2011 and Fall 2015, the City must be able to provide at least 0.5 mgd (0.77 cfs) to Georgia Pacific on these occasions. As described in Section 2, the City has a water supply agreement with Georgia Pacific to provide up to 1.25 mgd of untreated water to Georgia Pacific when needed, but the quantity provided to Georgia Pacific may be restricted if demand by existing municipal customers requires too much of the available water under the City's water rights to supply the full 1.25 mgd. Thus, water supply to Georgia Pacific is ultimately subject to availability. Given that Georgia Pacific is a large local industry that provides many jobs and other economic benefits to the City, the City has a strong interest in having sufficient water under the City's water rights to supply Georgia Pacific with water so that it can continue operations.

The City also projects that it will need additional water to meet projected new industrial demands by 2036. The City has a significant amount of buildable industrial land within its city limits and UGB, and the City developed the following methodology (described originally in applications for Extension of Time for Permits S-44083 and S-9370) to project the water demands associated with these lands.

According to the 2010 Toledo Economic Opportunities Analysis prepared for the City, approximately 358 acres within the City limits are zoned as industrial or light industrial and an additional approximately 23 acres are zoned as water dependent industrial. (See Attachment 5.) In addition, approximately 158 acres within the City's UGB are zoned as industrial or water dependent industrial. Approximately half of these industrial zoned acres are considered developed with no further potential for additional development. The analysis evaluated several criteria to determine what portion of the remaining potentially buildable land was expected to be buildable. The potentially buildable acreage was reduced to reflect constraints such as steep slopes, delineated wetlands, riparian setbacks, and other factors making a parcel unbuildable. The potentially buildable acreage was further reduced by 30 percent to reflect an allowance for public facilities such as streets. The resulting inventory of buildable lands within City limits was: 44.37 acres of industrial land, 21.16 acres of light industrial land, and 7.59 acres of water dependent industrial land. In addition, 86 acres of industrial land and 11.13 acres of water dependent industrial land were identified within the City's UGB.

Industrial water demands per acre have been shown to vary from 0.02 mgd per acre for warehousing and manufacturing to 0.19 mgd per acre for large industrial use (See **Appendix B: Port of Umatilla WMCP Excerpt**)<sup>3</sup>. **Exhibit 5-3** shows the potential range of future industrial water use by applying industrial use factors in different proportions. As shown under a "moderate water demand" scenario, in which low water demand industries occupy 60 percent of the 51.96 acres of industrial land, and high water demand industries occupy 40 percent of this land within the City limits, the total projected industrial demand

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<sup>3</sup> These industrial water demands per acre figures from the Port of Umatilla were used in the City's applications for extension of time for Permits S-44083 and S-9730. OWRD approved extensions of time for both permits on December 3, 2013. Although the Port of Umatilla and the City of Toledo have different climates, the industrial water demand per acre figures are not expected to be significantly different given that location of the industrial facility has little bearing on the demand per acre for these types of water uses.

would be approximately 4.57 mgd (7.07 cfs). Light industrial demands have been shown to have a potential demand of 0.001 mgd per acre. Applying this use factor to the 21.16 acres of light industrial buildable land within the city limits yields a projected demand of 0.02 mgd (0.03 cfs).

Thus, the City estimates water demand at build-out for all of the buildable industrial land within City limits to be approximately 7.1 cfs ( $7.07 + 0.03 = 7.1$ ). Based on the City's best professional judgement, the City estimates that approximately one-eighth of the buildable industrial lands within City limits will be developed by 2026, one quarter will be developed by 2036, and that buildout will occur by 2055. Consequently, the City estimates that new industrial demand in 2026 will be ( $7.1 \times 0.125 = 0.89$ ) and in 2036 will be 1.78 cfs ( $7.1 \times 0.25 = 1.78$ ). To provide a more conservative projection, the industrial lands outside of the city limits but within the UGB were not considered in this demand projection. However, given the uncertainty about how quickly development will occur over the next 20 years, the City will just use the estimate of new industrial demand in 10 years (0.89 cfs) in its total demand projections in 20 years and will provide an updated industrial demand projection for 2036 in the next WMCP update.

Exhibit 5-3. Potential Industrial Demand Scenarios for Industrial and Water Dependent Industrial Lands in the City.

Scenarios	Division of Land (acres)		Amount of Water Use (mgd)		
	Low Water Use Industry	High Water Use Industry	Low Use (0.02 mgd/Ac)	High Use (0.19 mgd/Ac)	Total
<b>High Water Demand (10% / 90%)</b>	5.2	46.76	0.10	8.88	8.98
<b>Low Water Demand (90% / 10%)</b>	46.76	5.2	0.94	.99	1.93
<b>Moderate Water Demand (60% / 40%)</b>	31.18	20.78	0.62	3.95	4.57

Therefore, the total projected demand in 2026 is 4.69 cfs (3.03 cfs municipal use + 0.89 cfs new industrial uses + 0.77 cfs Georgia Pacific) and in 2036 is 5.08 cfs (3.42 cfs municipal use + 0.89 cfs new industrial uses + 0.77 cfs Georgia Pacific).

The City intends to reduce its demand through water management and conservation measures as described in Section 3, and anticipates reducing its overall demand by approximately 10 percent as a result. Consequently, the City has reduced its initial municipal use demand projections by approximately 10 percent, resulting in a total projected demand in 2026 of 4.39 cfs (2.88 cfs municipal use + 0.89 cfs new industrial uses + 0.77 cfs Georgia Pacific) and in 2036 of 4.74 cfs (3.08 cfs municipal use + 0.89 cfs new industrial uses + 0.77 cfs Georgia Pacific).

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

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

As previously described, the City holds water rights from Mill Creek and from the Siletz River. Due to low flows in Mill Creek and water quality problems caused by algae blooms, the City relies on its Siletz River water rights to meet its municipal demands during the summer (peak season) and fall months. Similarly, wholesale customer SRWD currently relies exclusively on the Siletz River during peak season and water supplied under the City's water rights that are senior to the existing instream water rights. The City also has a water supply agreement with Georgia Pacific to provide water when diversions under Georgia Pacific's water right certificate 31263 on the Siletz River are insufficient.

As described above, the City's total projected demand (assuming a reduced demand of 10 percent) in 2036 is 4.74 cfs (3.08 cfs municipal use + 0.89 cfs new industrial uses + 0.77 cfs Georgia Pacific). To meet this demand, the City will use the 3.09 cfs to which the City currently has access, as authorized by the water rights evidenced by Transfer T-11451 (1.34 cfs under the right previously evidenced by Certificate 87645 and 1.75 cfs under the right previously evidenced by Certificate 14396). To meet the remaining 1.65 cfs of projected demand ( $4.74 - 3.09 = 1.65$ ), the City will need access to 1.65 cfs under Permit S-9370. Thus, the City is requesting access to 1.65 cfs of "green light water" under extended permit S-9370.

The City anticipates that it will fully develop Permit S-44083 prior to 2055, as described in the City's recently approved permit extension. Given that the City's projected need for access to "green light water" is 1.65 cfs and that need can be met by Permit S-9370, the City does not anticipate needing to use water under Permit S-44083 through 2036. Finally, since SRWD's Beaver Creek system is still in the permitting/engineering process, the City anticipates continuing to serve SRWD in the near-term and in the long-term. It is the City's understanding that SRWD intends to retain its connection to the City and will continue to rely on water from the Siletz River to provide a redundant source of supply.

## 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 plans to continue to implement its current water management and conservation measures, to implement its water conservation benchmarks, and to add further water conservation measures as appropriate over the course of the 20-year planning of this WMCP.

As described above, if the City reduces water demand by 10 percent as a result of water management and conservation measures, the total projected demand in 2026 will be 4.39 cfs (2.88 cfs municipal use + 0.89 cfs new industrial uses + 0.77 cfs Georgia Pacific) and in 2036 will be 4.74 cfs (3.08 cfs municipal use + 0.89 cfs new industrial uses + 0.77 cfs Georgia

Pacific). Under this scenario, the City will meet the projected demand using the 3.09 cfs currently authorized by the water rights evidenced by Transfer T-11451 and 1.65 cfs of Permit S-9370. Given the City's need for water under Permit S-9370 even after reducing its demand by 10 percent, water conservation alone cannot preclude the City's need to initiate diversion under Permit S-9370.

### **(b) Interconnections**

The City does not have interconnections that will reduce its need to expand water use under Permit S-9370. The City's only interconnection with another municipal water supply system is with SRWD, and this interconnection is one way to SRWD. (Water cannot currently be pumped uphill from SRWD to the City.) The nearest cities, the City of Siletz and the City of Newport, also divert water from the Siletz River. Given that the cities share a water source, an interconnection does not provide a different water supply source that could reduce the City of Toledo's need to expand water use under Permits S-9370. The City of Newport's Certificate 89102 is for the use of up to 6 cfs from the Siletz River and is senior to the instream water rights (priority date September 24, 1963). During the peak season, this is the City of Newport's only water right that is capable of providing it with a supply of raw water due to inadequate flows in the City's other sources. The City of Newport is currently searching for other potential sources of meeting future water demand.

### **(c) Cost Effectiveness**

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

The City believes implementing water conservation measures is important, and as such, is investing more resources into water management and conservation efforts. However, as described above, water conservation efforts will not be sufficient to avoid the need to expand water use under Permits S-9370 within the next 20 years. Furthermore, the City already has the necessary infrastructure in place to beneficially use the requested "green light water," so the City will not incur additional costs by expanding water use under Permit S-9370. Consequently, satisfying the City's projected water demands through other conservation measures is not feasible nor more cost-effective.

## **Quantification of Projected Maximum Rate and Monthly Volume** **OAR 690-086-0170(6)**

OAR 690-086-0170(6) requires a quantification of the maximum rate of withdrawal and maximum monthly use if any expansion or initial diversion of water allocated under an existing permit is necessary to meet demands in the near future. Within the next 20 years, the City is planning to need up to 1.65 cfs under Permit S-9370 to help meet its projected water demands. Assuming that the water right is used at a rate of 1.65 cfs (1.07 mgd), 24 hours per day for 31 days during the maximum month (likely July or August), the maximum monthly volume for the water right would be approximately 33.2 MG.

## **Mitigation Actions under State and Federal Law**

### ***OAR 690-086-0170(7)***

Under OAR 690-086-0170(7), for expanded or initial diversion of water under an existing permit, the water supplier is to describe mitigation actions it is taking to comply with legal requirements of the Endangered Species Act, Clean Water Act, and other applicable state or federal environmental regulations. The City does propose to expand diversion of water allocated under extended permits S-9370 and Permit S-44083 during the planning period of this WMCP. The final orders approving extensions of time for Permit S-9370 and Permit S-44083 included “fish persistence” conditions, which are described above in Section 2. The City is aware of these conditions. The City is not required to take any other mitigation actions under state or federal law.

## **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. As shown in the above, the City’s water rights are sufficient to meet projected demands during the next 20 years. Consequently, the City currently does not plan to acquire additional water rights within that timeframe.

# **Appendix A**

## **Letters to Local Governments and Comments**







February 28, 2017

Michael Adams  
City of Toledo Planning Department  
City Hall  
206 N Main Street  
Toledo, OR 97391

Subject: Water Management and Conservation Plan for the City of Toledo

Dear Mr. Adams:

The City of Toledo 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.

Under these rules, the water supplier shall make its draft WMCP available for review by affected local governments and seek comments relating to consistency with the local governments' comprehensive land use plans. Enclosed is a USB flash drive containing the City of Toledo's draft WMCP for your review.

Please provide comments to me within 30 days from the date of this letter. If the plan appears consistent with your Comprehensive Land Use Plan, a letter response to that effect would be appreciated. You may send your comments to me by email at [asussman@gsiws.com](mailto:asussman@gsiws.com).

If you have any questions, please feel free to contact me at 541-257-9001. Thank you for your interest.

Sincerely,  
GSI Water Solutions Inc.

A handwritten signature in dark ink, appearing to read "Adam Sussman", is written over the printed name.

Adam Sussman  
Principal Water Resources Consultant

Enclosure



February 28, 2017

Onno Husing, Director  
Lincoln County Department of Planning and Development  
210 SW 2<sup>nd</sup> Street  
Newport, OR 97365

Subject: Water Management and Conservation Plan for the City of Toledo

Dear Onno Husing:

The City of Toledo 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.

Under these rules, the water supplier shall make its draft WMCP available for review by affected local governments and seek comments relating to consistency with the local governments' comprehensive land use plans. Enclosed is a USB flash drive containing the City of Toledo's draft WMCP for your review.

Please provide comments to me within 30 days from the date of this letter. If the plan appears consistent with your Comprehensive Land Use Plan, a letter response to that effect would be appreciated. You may send your comments to me by email at [asussman@gsiws.com](mailto:asussman@gsiws.com).

If you have any questions, please feel free to contact me at 541-257-9001. Thank you for your interest.

Sincerely,  
GSI Water Solutions Inc.

A handwritten signature in black ink, appearing to read "Adam Sussman", written over a horizontal line.

Adam Sussman  
Principal Water Resources Consultant

Enclosure

cc. Michael Adams, City of Toledo



February 28, 2017

Adam Denlinger  
Seal Rock Water District  
PO Box 190  
1037 NW Grebe Street  
Seal Rock, OR 97376

Subject: Water Management and Conservation Plan for the City of Toledo

Dear Adam:

The City of Toledo 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. Under these rules, the water supplier shall make its Draft WMCP available for review by affected local governments and seek comments relating to consistency with the local governments' comprehensive land use plans.

As a courtesy, the City of Toledo is providing you with a copy of the Draft WMCP on a USB flash drive. If you have any questions, please feel free to contact me at 541-257-9001 or [asussman@gsiws.com](mailto:asussman@gsiws.com).

Sincerely,  
GSI Water Solutions Inc.

A handwritten signature in dark ink, appearing to read "Adam Sussman", is written over a light blue horizontal line.

Adam Sussman  
Principal Water Resources Consultant

Enclosure

cc. Michael Adams, City of Toledo



February 28, 2017

Derrick Tokos, Director  
City of Newport Department of Community Development  
Newport City Hall  
169 SW Coast Highway  
Newport, OR 97365

Subject: Water Management and Conservation Plan for the City of Toledo

Dear Mr. Tokos:

The City of Toledo 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. Under these rules, the water supplier shall make its Draft WMCP available for review by affected local governments and seek comments relating to consistency with the local governments' comprehensive land use plans.

As a courtesy, the City of Toledo is providing you with a copy of the Draft WMCP on a USB flash drive. If you have any questions, please feel free to contact me at 541-257-9001 or [asussman@gsiws.com](mailto:asussman@gsiws.com).

Sincerely,  
GSI Water Solutions Inc.

A handwritten signature in black ink, appearing to read "Adam Sussman", is written over the typed name.

Adam Sussman  
Principal Water Resources Consultant

Enclosure

cc. Michael Adams, City of Toledo

# **Appendix B**

**Port of Umatilla WMCP Excerpt**



**EXHIBIT 5-5****Industrial Demand Factors for Industries in Oregon*****Port of Umatilla WMCP***

<b>Industry</b>	<b>Location</b>	<b>Maximum Demand (mgd)</b>	<b>Acres</b>	<b>Theoretical Demand Factor (mgd/ac)</b>
Hermiston WMCP	City of Hermiston	-	-	0.005
Electronics Industry	City of The Dalles	3.0	225	0.01
PepsiCo <sup>1</sup>	City of Albany	6.0	152	0.04
Cascade Grain Products	Port Westward, OR	1.9	44	0.04
Snakcorp <sup>1</sup>	Umatilla Co.	0.8	11	0.07
Lower Columbia Clean Energy Center	Port Westward, OR	8.4	84	0.10
Calpine Hermiston Power Partnership	Umatilla Co.	4.2	24	0.18
Hermiston Generating Co.	Umatilla Co.	3.7	13	0.28

<sup>1</sup> Demand represents maximum demand after ultimate expansion.

Industrial demand factors from existing industries, and estimated demand factors from other communities were used to determine the potential water demand from the Port's undeveloped industrial sites. **Exhibit 5-6** shows the sites, projected industry types, the per acre industrial use factors, and the projected water use at the Port of Umatilla's shovel-ready and uncertified industrial sites. As industries are built, projections should be updated to reflect actual water demands.



**EXHIBIT 5-6**

Summary of the Port of Umatilla's available industrial land, potential customer type, and estimated MDD  
*Port of Umatilla WMCP*

Site Name	Size of Site (ac)	Potential Customer Type	Industrial Use Factor (mgd/ac)	Estimated MDD (mgd)	Estimated MDD (cfs)
Draper	15	Offices, service businesses, light assembly	0.001	0.015	0.02
Con-Agra	33	Warehousing and manufacturing	0.02	0.7	1.
McNary	114	Warehousing and manufacturing	0.02	2.3	4
Conforth	320	Large Industrial	0.19	61	94
<b>Subtotal Shovel Ready<sup>1</sup></b>	<b>482</b>			<b>64</b>	<b>99</b>
Additional sites	53	Yet to be designated	0.005	0.265	0.41
<b>Total</b>	<b>535</b>			<b>64</b>	<b>99</b>

<sup>1</sup> Future water use at the former JR Simplot Co. site was not included in this sub-total. Water use at this site may be re-established in the future.

### Use of Port's Water for Groundwater Relief

As noted, much of the northern portion of Umatilla County has been designated a CGWA. The Umatilla County Critical Groundwater Task Force is investigating ways to use the Regional Water System's water supply to help offset the area's shrinking groundwater supplies through projects such as aquifer storage and recovery (ASR). In ASR, water produced during the winter months is stored within an aquifer for later use in the high demand summer months. Any amount of the Port's surface water rights that are not being used by industrial or municipal customers could be sought by the Task Force.

## Schedule to Exercise Permits and Comparison of Projected Need to Available Sources 690-086-0170 (2) and (4)

### Summary of Projected Water Demands

Exhibits 5-7 and 5-8 summarize demand projections from currently identified municipal, existing industrial, and potential industrial customers through 2027 and buildout. The Port anticipates that existing industrial customers will fully develop their contract demands, and that demand from new industrial customers will approach 40 percent of buildout within the 20-year planning horizon. At buildout, the total demand from industrial, and currently-identified municipal customers is estimated to approach 155 cfs. As noted above, additional demand may be placed on the Regional Water System from other communities within Umatilla County, or from projects directed by the Umatilla County Critical Groundwater Task Force.