



City of Rockaway Beach

Tillamook County, Oregon

Water Management & Conservation Plan

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Prepared By:

H B H
CONSULTING
ENGINEERS

501 E. First Street
Newberg, Oregon 97132
503.554.9553
fax 503.537.9554
mail@hbh-consulting.com

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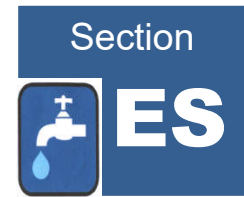
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City of Rockaway Beach
Water Management & Conservation Plan



Executive Summary

Executive Summary



E.1 Background and Need

The City of Rockaway Beach is submitting this Water Management and Conservation Plan (WMCP) in accordance with Oregon Administrative Rules (OAR) 690-315 and 690-086. The City was required by Oregon Water Resource Department (WRD) to develop a WMCP as a condition of a water right permitted in 2002. Furthermore, the City must apply for permit extension for this permit, as well as water permit originally granted in 1981. This update was also required as a condition of the final order accepting the most recent WMP because substantial improvements on the system were planned and completed within the 10 year time frame.

The City has established the following objectives for this plan:

- Meet State requirements for WMCP;
- Improve management of the City's water sources;
- Minimize operational costs;
- Develop policies to decrease summer peak demands;
- Identify techniques and strategies to increase conservation by the City and public that lower overall system demand; and
- Increase customer satisfaction.

This Plan includes specific sections that address each of the four required elements for WMCPs: (1) a description of the City's water supply system and a history of water usage; (2) a water conservation plan; (3) a water curtailment plan; and (4) an analysis of the 20-year projected water demand and supply. This Plan also provides a list of affected local governments to whom the plan has been made available and a proposed schedule for updates to this WMCP.

E.2 Planning Area

City of Rockaway Beach is located on the northern Oregon coast approximately 75 miles west of Portland. The City is situated between Tillamook Bay to the south and Nehalem Bay to the north. To the east are the Coast Range Mountains and to the west is the Pacific Ocean.

The City of Rockaway Beach currently provides water service to 2,558 accounts within the City's Urban Growth Boundary (UGB). The Urban Growth Boundary includes the City of Rockaway Beach, unincorporated areas of Nedonna Beach, and portions of Twin Rocks. The Rockaway Beach City Limit encompasses approximately 936 acres (1.46 square miles) and the UGB covers approximately 1453 acres (2.27 square miles).

The City of Rockaway Beach relies heavily on tourism as its economic base. There is no reliance on other traditional coastal industries such as fishing, agriculture, or forestry. The height of the tourist season occurs in the summer. During the summer, tourists enjoy the local beaches and lakes and

increase commercial patronage of retail businesses, restaurants, and motels. In addition, single family rental properties as well as summer homes are occupied.

E.3 Population

The population for the City of Rockaway Beach Water System is actually greater than the estimated population of the City of Rockaway Beach. The water system serves the City, the unincorporated areas of Nedonna Beach, areas outside of the City but within the UGB, and a development just south east of the UGB. The 2010 Census shows that 38% of the total housing units are occupied. From this, it can be assumed that 62% of the housing units within the City are owned by a transient population that does not make Rockaway Beach their full time residence.

E.4 Water Demand

The City's most recent water master plan provides the following information about water demands.

Records from the master plan show an average annual water production of 109.25 million gallons during this time. Based on these records, the average per capita usage of 167 gallons per capita per day (gpcd) is high compared to other communities and 1.67 times the normal water usage rate of 100 gpcd identified in the "Guidelines for the Preparation of Planning Documents for Developing Community Water System Projects", prepared by State of Oregon, Federal Government, and various non-profit organizations. The table below summarizes the City's water production 2-year history.

Table E-1: Summary of Existing Water Demands

	2011	2012	Average
Annual Demand (MG)	116.75	101.75	109.25
Average Daily Demand (mgd)	0.320	0.278	0.299
Maximum Daily Demand (mgd)	0.634	0.758	0.696
ADD Per Capita (gpd)	179	154	167
ADD Per EDU (gpd)	125	108	117

E.5 Existing Water Sources

Prior to 1975, the City drew water from five surface water sources: Jetty Creek, Steinhilber Creek, McMillan Creek, Rock Creek and Heitmiller Creek. Of the five original surface water sources, only Jetty Creek continues to serve the City. In addition to the City's two water rights on Jetty Creek, the City also has rights to three wells in the Nedonna Beach aquifer. These current sources combine to allow the City to withdrawal up to 1.8 million gallons per day (mgd). However, production is limited by seasonal low flows in Jetty Creek and poor water quality in these wells. To date, all but two of the City's municipal water rights have been put to full beneficial use and fully certificated. The remaining unperfected rights include one on Jetty Creek and the most recent groundwater right, Manhattan Well.

Water rights from the Jetty Creek and the three wells allow 1,248 gpm of water to be diverted to the City's water system. This is approximately 6.2 times the average annual use and 2.6 times the average peak demand. However, limitations in source reliability, water quality, and infrastructure prevent the City from withdrawing the full capacity of their water rights. In fact, two of the City's wells are not used due to poor water quality. Although the City has never experienced significant water shortages, the reduced quantity of water available for production caused by these limitations has made it difficult for the City to meet water demand during periods of high usage.

Water from Jetty Creek is pumped to a treatment facility that was recently upgraded. Treatment includes coagulation, flocculation, filtration, and disinfection. After treatment, water is discharged by gravity into an on-site, below grade concrete clearwell. From the clearwell, disinfected potable water is pumped into the distribution system and to remote storage reservoirs. Water from the West and East wells can be either discharged into the raw water pump station or bypassed directly to the treatment plant clearwell. However, water from these wells is normally routed through the water treatment plant. The wells are used to supplement the Jetty Creek source and also elevate the finished water pH to reduce the corrosivity of the water. The water from the Manhattan well is injected with chlorine and pumped directly into the distribution system. This well is primarily used for emergency and peak use.

E.6 Conservation Element

Traditional water management planning focused on the development of new water supply sources to accommodate increased water demand. This supply-side planning approach has often viewed water conservation as a temporary response to an emergency or drought situation only. However, current water management planning practices put water conservation on equal footing with new water supply projects as potential water sources.

The City has outlined a conservation program in Section 3. This program is designed to incorporate each of the elements noted under OAR 690-086-0150 (4) and address the City's goal of reducing unaccounted water which currently represents 23.4% of the water system's total production. The City also has a goal of decreasing the overall water demand, especially peak summer demands. A large percentage of this unaccounted water is believed to have been associated with a leak at one of the City's major reservoirs. This reservoir was decommissioned and replaced in spring/summer 2008. Major leaks at other reservoirs have also been repaired since the last plan. Another major leak was found and repaired in a 10" main in October 2016.

A summary of the action and related benchmarks for the conservation program are outlined in the following table.

Table E-2: Summary of Conservation Program Benchmarks

Benchmark	Start Date	Frequency
Water use measurement reporting	NA	Annual
Water audit	On-going	Annual
Customer meter replacement program	On-going	On-going
Source meters calibration	On-going	Annually
Replace Scenic View reservoir	Completed 2009	NA
Develop conservation web page	2019	On-going
Distribute water conservation brochures	2018	On-going
Publish conservation articles in the City's newsletter	On-going	2-4 times per year
Post conservation signage	2020	On-going
Radio and TV ads	2020	On-going
Leak detection program	On-going	10-years
Develop school conservation programs	2021	Annual
Line repair & replacement program	On-going	On-going
Replacement of inefficient fixtures in City buildings	NA	Completed by 2013
Incentive/rebate feasibility determination	On-going	NA
Water Waste Ordinance consideration	On-going	NA
Reduce Unaccounted Water by 2% by next WMCP	2019	On-going

E.7 Curtailment Element

The City developed a water curtailment plan as part of its Emergency Response Plan in 2005. The curtailment plan element represents one of the tools available to the City to meet a water emergency. The curtailment plan includes four stages of alert, triggers for each stage, and curtailment actions that will satisfactorily promote conservation practices. The following table provides a summary of each emergency stage and describes the objective of each stage in relation to water curtailment during water emergencies.

Table E-3: Curtailment Program Summary

Stage	Level	Description
1	Mild	Primarily a tool to inform the public that a potential problem exists. The problem may not yet warrant mandatory water curtailment, but does suggest voluntary conservation.
2	Moderate	First level of action for the City to enact mandatory water restrictions. This level would include all planned activities requiring temporary conservation including construction and maintenance activities as well as preparing for expected drought conditions.
3	Severe	A wider range of activities are affected. This is the most restrictive level of mandatory water conservation activities carrying the highest penalties to enforce the curtailment status.
4	Critical	Reserved for extreme water supply problems, typically in response to a major natural disaster. The goal of this stage is to provide minimum amount of water to the consumers to sustain life and would probably include rationing of drinking water.

This plan also provides steps for the curtailment program implementation that include: (1) recommendation for water emergency status by City staff, (2) passing of an emergency resolution by City Council, and (3) plan enactment. The City will continue to review this curtailment plan and update it as necessary. Any changes to this plan will be detailed in future WMCP progress reports and updates.

E.8 Projected Demands

There is no anticipated extension of Rockaway Beach’s UGB within the planning period of this WMCP and the general customer characteristics of the community are also expected to remain constant. Future water demands were calculated by estimating the future number of EDUs and applying a standard average and maximum daily demand per EDU.

The recent water master plan updated population and demand projections. It used a 1% annual growth rate, an 167gal/person for ADD and 2.19 ADD:MDD peaking factor.

Table E-4 summarized the projected water demands through the 20-year planning period based on the numbers provided from the master plan.

Table E-4: Projected ADD and MDD for the 20-Year Planning Period

Year	Population	Average Daily Demand (gpd)	Maximum Daily Demand (gpd)
2019	1,847	308,000	675,000
2024	1,941	324,000	710,000
2034	2,144	358,000	784,000
2039	2,254	376,000	824,000

E.9 Future Source Capacity

The average minimum source capacity was evaluated to determine if additional sources are required for the City within the next 20 years. Jetty Creek’s average low stream flow of 1.96 cfs occurs in August. However, there is an existing in-stream water right of 0.5 cfs for fish and aquatic life protection. The West Well can provide an additional 150 gpm. Assuming that the water treatment plant can run 20 hours per day, the average quantity of treated water available to the system is 861,120 gpd after the recent upgrades.

The analysis on existing source capacity was based on the average minimum summer supply. However, flows in Jetty Creek frequently drop below 1.96 cfs. In fact, an exceedance probability analysis determined that between July and September, 49.7% of daily flows are below 1.96 cfs. This is also the same time of year that the highest demands on the system occur. Therefore, even with conservation implementation, the City may need additional source capacity to supplement the current sources, especially during summer.

The City of Rockaway Beach needs to seriously examine its available water sources. The first action needed by the City is to secure its existing water rights. In particular, the City needs to begin the process of requesting addition time for full beneficial use of its two uncertified rights. This will ensure that the maximum permitted diversions will not be eliminated or reduced.

Three alternatives for providing additional source water for the City's water system were assessed:

1. Developing existing water rights at Spring Lake
2. Interconnection with the City of Manzanita or City of Garibaldi
3. Increasing the raw water storage capacity at the Jetty Creek impoundment. This option would only provide a portion of the needed increase to the City's water source. A second alternative would also need to be developed as part of the City's long-term water supply security.

E.10 Beneficial Use

As previously noted, all except two of the City's Water Rights have been certified. The uncertified water rights include the rights on Jetty Creek (Permit No. S46245) and the Manhattan Well (Permit No. G15325). Currently, the deadlines for application of beneficial use by the groundwater permit has expired, but the deadline for the surface water permits doesn't expire until 2020. The City submitted an *Application for Extension of Time for Municipal and Quasi-Municipal Water Use Permits* to OWRD to maintain the expired right.

An update on the status of the permit extension and right perfection will be provided in the 2021 WMCP progress report.

E.11 Proposed Schedule for Updating Plan

Following the administrative rules, the City proposes to submit a progress report in 2021 (five years) to review noted benchmarks and water conservation progress. The City proposes to submit an updated WMCP at the end of the 10-year period in 2026.



Section 1

Introduction



Introduction

The City of Rockaway Beach is pleased to present this Water Management and Conservation Plan (WMCP) to the Oregon Water Resources Department (OWRD) and interested parties for review. This Plan is based on the requirements of the Oregon Administrative Rule (OAR) Chapter 690 division 86. This WMCP fulfills a condition placed on the City of Rockaway Beach by the final order approving the former WMCP, and fulfills WMCP requirements that might be placed on the City as a condition for any extension of other water rights that the City owns or may apply for in the future during the period covered by this plan. Upon approval by the OWRD, it will be adopted by the City Council and administered by the Public Works Supervisor.

1.1 GENERAL SYSTEM DESCRIPTION

The City of Rockaway Beach is located on the north Oregon coast approximately 75 miles west of Portland. The City is situated between Tillamook Bay on the south and Nehalem Bay to the north. To the east are the Coast Range Mountains and to the west is the Pacific Ocean. The area provides recreational opportunities for boating and camping with ample public access to ocean beaches. The area also has a State park to the immediate north, several State waysides, and a County park.

The City of Rockaway Beach currently provides water service to customers within the City's Urban Growth Boundary (UGB). The Urban Growth Boundary includes the City of Rockaway Beach, unincorporated areas of Nedonna Beach, and portions of Twin Rocks. The Rockaway Beach City limit encompasses approximately 936 acres (1.46 square miles) and the Urban Growth Boundary covers approximately 1,453 acres (2.27 square miles).

As of the most recent Water Master Plan, the City of Rockaway Beach provides water service to 2,558 customer accounts. Records from 2011 to 2012 show an average annual water production of approximately 109,250,000 gallons, equating to an average of 120 gallons per day per account. Annual water production has decreased over this period, which has been assumed to be associated with leak repairs performed by the City during the past few years, as well as conservation methods. Major leaks in multiple reservoirs have been repaired since the last WMCP. This has significantly reduced the amount of water produced. The average maximum daily demand (MDD) of 696,000 gallons per day (GPD) resulted in average peaking factor of 2.33 when compared to the average daily demand (ADD) of 299,000 GPD. Another leak found and repaired in October 2016 reduced the unaccounted water by a significant amount.

Prior to 1975, the City drew water from five surface water sources: Jetty Creek, Steinhilber Creek, McMillan Creek, Rock Creek and Heitmiller Creek. Water was chlorinated and discharged into the distribution system without the benefit of any additional treatment. Of the five original surface water sources, only Jetty Creek continues to serve the City. In addition to the City's two water rights on Jetty Creek, the City also has rights to three wells in the Nedonna Beach aquifer. These current sources combine to allow the City to withdraw up to 1.8 million gallons per day (mgd) however Rockaway Beach's water treatment facility capacity limits production to 1.15 mgd. Production is further limited by seasonal low flows in Jetty Creek and poor water quality in production wells. To date, all but two of the City's municipal rights have been put to full beneficial use and fully certificated.

1.2 WMCP History

A WMCP is a plan developed by a water supplier that describes the water system and its needs, identifies its water sources, and explains how the water supplier will manage and conserve those supplies to meet present and future needs. In short, a WMCP is a long term water management and conservation tool and it is intended to represent a pro-active evaluation of the management and conservation measures that suppliers can undertake.

Oregon's municipal water suppliers are permitted to "grow into" their water rights over a period of time. Historically, the OWRD routinely issued five-year extensions to suppliers to continue developing municipal permits. Once the water permit was fully used, the community submitted proof of perfection of the right and OWRD issued a certificate of water right. In 1989, the statutes were amended to also allow many municipal water suppliers to certificate their water rights in 25-percent increments.

In 2002, the OWRD adopted a new approach to municipal water permit extensions that provided long-term permit extensions on the condition that the water supplier would develop a WMCP. Under the revised rules, a municipal permittee can request a long-term extension to complete development of the water right. The period of the extension depends on the municipality's projections of how long it will take to fully use the quantity of water allowed under the permit. However, under the extension, the municipality will not be authorized to initiate or expand their use of water under the permit beyond the current authorized quantities. This authorization is granted through OWRD's review and approval of the municipality's WMCP.

These new rules are contained in OAR Chapter 690, Division 86 and 315. Important concepts in these rules include:

- Municipal permittees can now request extensions based on the period of time that will be needed to fully develop the permit. Depending on the particular circumstances, an extension can be issued for as long as 50 years, or even longer with sufficient documentation.
- Most future municipal water right extensions include a requirement that the supplier prepare or update a WMCP within three years of approval of the extension and "freezing" the quantity of water that may be diverted or pumped under the extended permit pending completion of the WMCP.
- The supplier will be required to gain OWRD approval for any expansion of the use of water under an extended permit. This approval will be provided based on a demonstration in the supplier's WMCP that the water will be needed in the next 20 years. Suppliers may submit updated plans seeking authorization for additional water at any time.
- Water conservation is now viewed as a critical element in the State's water supply inventory. Water suppliers will need to show in their WMCPs that they have considered a range of water management and conservation actions to minimize their needs and to develop their supplies in an environmentally responsible manner: conservation actions must be considered as an alternative to increase development of water.
- All water suppliers must implement a core group of water conservation measures. Some water suppliers must also consider the feasibility of a range of additional conservation actions. In general, those water suppliers service a population greater than 7,500 must consider the additional actions. Some water supplier serving smaller communities will also

need to consider a wider range of conservation actions if they are expanding their use of sensitive resources.

1.3 PURPOSE AND NEED

This Water Management and Conservation Plan (WMCP) has been developed to address the City’s long-term water supply needs and to meet the requirements of Oregon Administrative Rules (OAR) Chapter 690 Division 86 as required per the City’s Water Right permit G15325 and the final order approving the most recent WMCP.

1.4 AUTHORIZATION

The City of Rockaway Beach authorized the firm of HBH CONSULTING ENGINEERS, INC. to develop a Water Management and Conservation Plan in accordance with this professional services contract retaining HBH as the City Engineer.

1.5 PROPOSED PROGRESS REPORT AND UPDATE SCHEDULE

Following the Oregon Administrative Rules, the City proposes to submit a progress report in 2021 (five years) to review noted benchmarking and water use progress. The City is not planning to submit another updated WMCP until the required 10-year period in 2026.

1.6 SUMMARY OF DATA SOURCES

Throughout this WMCP are references to data, most of which were obtained from City files including, records of pumping withdrawal, customer billing, land use planning, and operational control. Historical data related to service area, such as connections and water revenue, was obtained from the City’s utility billing system. This plan utilized data from the most recent water master plan and water management and conservation plan. Calculations, numbers, statistics, and mapping from these data sources were not verified because they are part of accepted City documentation and that is beyond the scope of this project.

1.7 INPUT DURING PLAN DEVELOPMENT

This plan is the result of contributions made by a number of individuals and agencies. In particular, the following persons should be acknowledged for the important roles they played in the preparation, review, and development of this plan:

Luke Shepard City of Rockaway Beach
Kerri H. Cope..... Oregon Water Resource Department

In addition to these key personnel, we wish to thank the City of Rockaway Beach City Council and management staff for providing support and input on the project.

1.8 DOCUMENT ORGANIZATION

This WMCP is organized in a manner consistent with Division 86 rules as follows:

Section 1: Introduction

Section 2: Water Supplier Description

This section provides the foundation of this Plan by providing current information about the water supplier, City of Rockaway Beach, and its water system. Required components of this section include descriptions of the sources of water, service area, present service population, adequacy and reliability of water supply, water use characteristics, water rights, interconnections with other water systems, water system demand, maps, and leakage estimates.

Section 3: Water Conservation Element

This section includes a summary of past, current, and future water conservation measures performed or planned by the City of Rockaway Beach. Benchmarks have been developed for all future conservation measures. Progress on these benchmarks will be reported in the WMCP progress reports or update.

Section 4: Water Curtailment Element

This section is designed to help the City react quickly and effectively to meet a community's need in the event of a water supply emergency, such as supply shortage due to drought, contamination, or infrastructure failure. This element requires the City to prepare a curtailment plan with stages of alert that trigger increasingly restrictive water use requirements.

Section 5: Water Supply Element

This section describes future water supply needs of the City. These needs are based upon population projections and anticipated development as found in comprehensive land use plans and other planning documents. The water supply needs are estimated for 10 and 20 years.

The following table lists the elements required by the Division 86 Rules and are included in this document:

Table 1-1: Water Management & Conservation Plan Requirements

WMCP Plan Elements			
	Notice to affected local governments	690-086-0125 (5)	1.7
	Proposed WMCP update schedule	690-086-0125 (6)	1.5
	Additional time to implement conservation benchmarks	690-086-0125 (7)	3.1
Water Supplier Description			
	Supplier's source(s)	690-086-0140 (1)	2.4
	Current service area & population served	690-086-0140 (2)	2.1
	Assessment of adequacy and reliability of existing water supplies	690-086-0140 (3)	2.4
	Present and historic water use	690-086-0140 (4)	2.3
	Water rights inventory table and environmental resource issues	690-086-0140 (5)	Table 2-6
	Customers served and water use summary	690-086-0140 (6)	2.2
	Interconnections with other systems	690-086-0140 (7)	2.6
	System schematic	690-086-0140 (8)	Figure2-4
	Quantification of system leakage	690-086-0140 (9)	2.7
Water Conservation Element			
	Progress report on implementation of conservation measures	690-086-0150 (1)	3.1
	Water use measurement and reporting program	690-086-0150 (2)	3.2
	Currently implemented conservation measures	690-086-0150 (3)	3.9
	Annual water audit	690-086-0150 (4)(a)	3.5
	Full metering of systems	690-086-0150 (4)(b)	3.3
	Meter testing and maintenance program	690-086-0150 (4)(c)	3.3
	Rate structure	690-086-0150 (4)(d)	3.4
	Leak detection program	690-086-0150 (4)(e)	3.6
	Public education program	690-086-0150 (4)(f)	3.7
	System leakage reduction program <15%	690-086-0150 (5)	3.8
	System leakage reduction program <10%	690-086-0150 (6)(a)	3.6
	Technical and financial assistance programs	690-086-0150 (6)(b)	3.8
	Retrofit/replacement of inefficient fixtures	690-086-0150 (6)(c)	3.8
	Rate structure and billing practices that encourage conservation	690-086-0150 (6)(d)	3.8
	Reuse, recycling, non-potable opportunities	690-086-0150 (6)(e)	3.8
	Other proposed conservation measures	690-086-0150 (6)(f)	3.8
Water Curtailment Element			
	Water supply assessment and description of past deficiencies	690-086-0160 (1)	4.1
	Stages of alert	690-086-0160 (2)	4.3
	Triggers for each stage of alert	690-086-0160 (3)	4.2
	Curtailment actions	690-086-0160 (4)	4.3
Water Supply Element			
	Future service area and population projections	690-086-0170 (1)	5.1
	Schedule to fully exercise each permit (i.e. certification)	690-086-0170 (2)	Table 5-4
	Demand forecast	690-086-0170 (3)	5.2
	Comparison of projected need and available sources	690-086-0170 (4)	5.3
	Analysis of alternative sources	690-086-0170 (5), (8)	5.3
	Maximum rate and monthly volume quantification	690-086-0170 (6)	Table 2-6
	Mitigation actions under state and federal laws.	690-086-0170 (7)	5.5
	Greenlight Water Request - Conservation measure schedule and cost effectiveness	690-086-0170 (8)(a)	3.1
	Greenlight Water Request - Justification that selected source is most feasible and appropriate	690-086-0170 (8)(b)	5.3
	Greenlight Water Request - Mitigation requirements	690-086-0170 (8)(c)	3.7

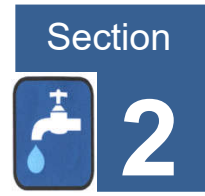
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Section 2

Water Supplier Description

Element 1: Water Supplier Description



The objective of this section of in Water Management and Conservation Plan (WMCP) is to provide a detailed description of Water Supplier, City of Rockaway Beach, which will serve as the foundation to the WMCP. The information presented in this section provides the baseline data necessary to assess the ability of the existing system to meet present and future demands.

Oregon Administrative Rule (OAR) 690-086-0140 requires every WMCP to provide a detailed description of the water supplier. This description must include: a description of the supplier’s sources; delineation and population estimate of the current service areas; assessment of the adequacy and reliability of the existing water supply; quantification of current and historic use; summary of water rights held by the supplier; description of customers served; identification and description of interconnections; system schematic; and quantification and description of system leakage. Table 2-1 provides details of where each element required by OAR 690-086-0140 is located within this section.

Table 2-1: Supplier Description Requirements

Requirement	OAR Reference	Section
Supplier’s source(s)	690-086-0140 (1)	2.4
Current service area & population served	690-086-0140 (2)	2.1
Assessment of adequacy and reliability of existing water supplies	690-086-0140 (3)	2.4
Present and historic water use	690-086-0140 (4)	2.3
Water rights inventory table and environmental resource issues	690-086-0140 (5)	Table 2-6
Customers served and water use summary	690-086-0140 (6)	2.2
Interconnections with other systems	690-086-0140 (7)	2.6
System schematic	690-086-0140 (8)	Figure 2-4
Quantification of system leakage	690-086-0140 (9)	2.7

2.1 SERVICE AREA AND POPULATION

Service Area

The City of Rockaway Beach is located on the north Oregon coast approximately 75 miles west of Portland. The City is situated between Tillamook Bay to the south and Nehalem Bay to the north (see Figure 2-1, “Location Map”). To the east are the Coast Range Mountains and to the west the Pacific Ocean. The area provides recreational opportunities for boating and camping with ample public access to ocean beaches. The area also has a State park to the immediate north, and several State waysides and a County park.

The City of Rockaway Beach provides water service to 2,558 customers within the City’s Urban Growth Boundary (UGB). The Urban Growth Boundary includes the City of Rockaway Beach, as well as the unincorporated areas of Nedonna Beach and portions of Twin Rocks. The City and UGB are located in Township 1 & 2 North, Range 10 West W.M. The Rockaway Beach city limit encompasses

approximately 936 acres (1.46 square miles) and the UGB covers approximately 1,453 acres (2.27 square miles). The City and UGB limits are shown in Figure 2-2, “Vicinity Map”.

Land use in the Urban Growth Boundary is divided into residential, resort, commercial, special wetland, waterfront, and open space (Table 2-2). Residential zoning is further categorized into single family (R1), residential (R2), low density (R3), and manufactured dwelling (RMD). These various residential zones represent approximately 63% of the total UGB area. Land use zoning is shown on Figure 2-2, “Vicinity Map”.

Table 2-2 Rockaway Beach Land Use Zoning

Land Use Zoning	Area	
	Acres	% of UGB
Single Family/Duplex (R1)	366	25.2%
Residential (R2)	396	27.3%
Low Density Residential (R3)	153	10.5%
Residential Resort (RR)	112	7.7%
Special Residential Resort (SRR)	3	0.2%
Commercial (C1)	76	5.2%
Special Wetlands Area (SA)	267	18.4%
Waterfront Development (WD)	9	0.6%
Residential Manufactured Dwelling (RMD)	51	3.5%
Open Space (OS)	20	1.4%
Total	1,453	100.0%

Population Estimates

The 2019 preliminary population estimate of Rockaway Beach was 1,365 as estimated by the Portland State University Population Research Center. The 2010 and 2000 census populations were 1,312 and 1,267, respectively. Annual population estimates for the City are presented in **Table 2-3**. Based on these population values, the rate of growth within the City has decreased over the past several decades. Between 1990 and 2000, the average annual growth rate (AAGR) in Rockaway Beach equaled 2.71%. This rate decreased to 0.38% between 2000 and 2017. The Rockaway Beach Comprehensive Plan lists an average of 1.9 people per household.

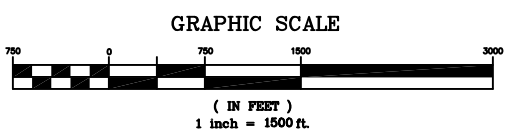
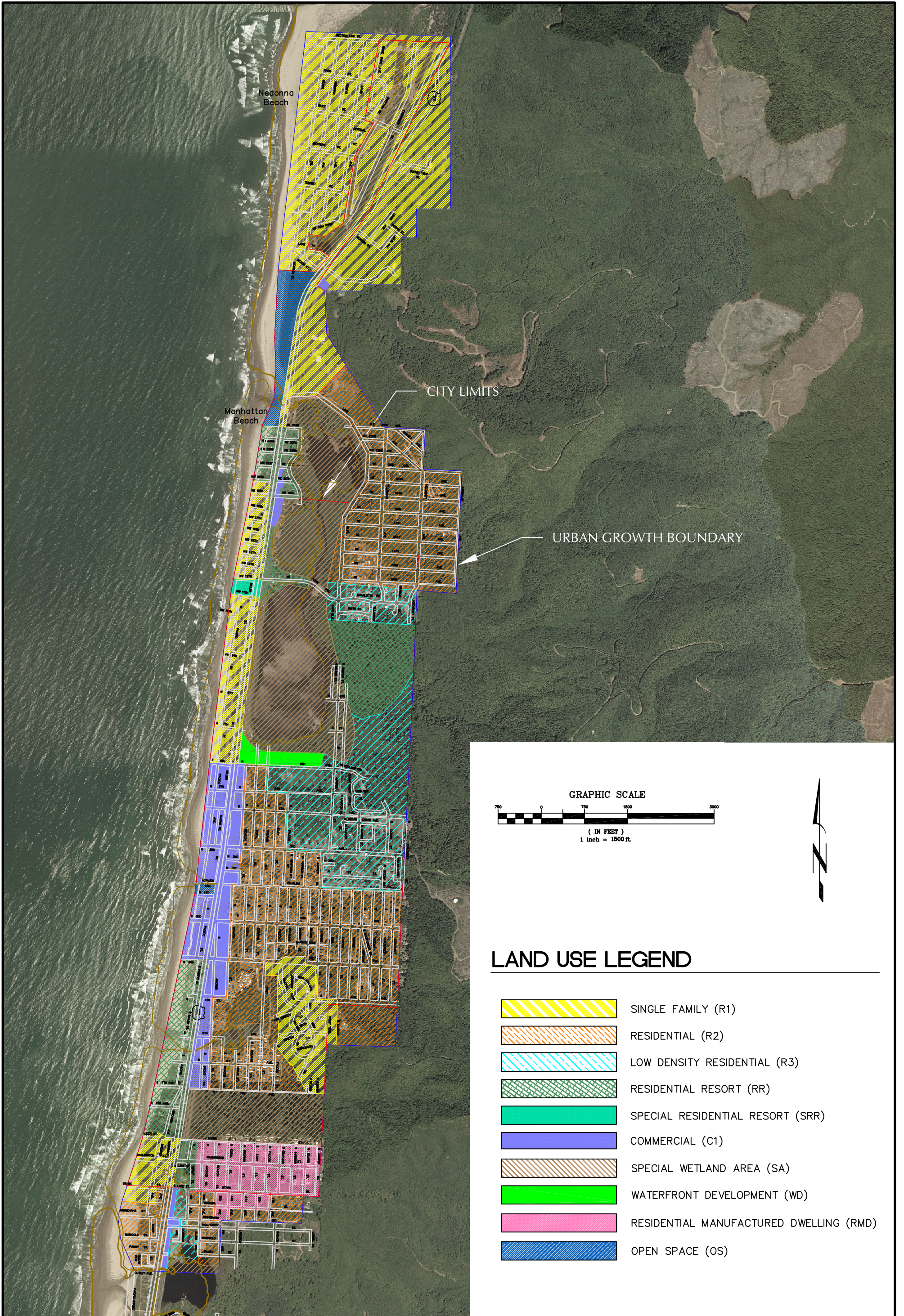
Table 2-3 City of Rockaway Beach Full-Time Population

Year	Total Population	Growth Rate
1990	970	
2000	1,267	2.71%
2001	1,290	1.82%
2002	1,290	0.00%
2003	1,300	0.78%
2004	1,320	1.54%
2005	1,345	1.89%
2006	1,345	0.00%
2007	1,360	1.12%
2008	1,375	1.10%
2009	1,380	0.36%
2010	1,312	-4.93%
2011	1,320	0.61%
2012	1,320	0.00%
2013	1,325	0.38%
2014	1,325	0.00%
2015	1,325	0.00%
2016	1,335	0.75%
2017	1,350	1.12%
AAGR 1990-2017		1.25%
AAGR 2000-2017		0.38%











*1990, 2000, 2010 and 2016 are Census Populations
 2001-2007 and 2011-2015 and 2017 are Population Research Center Estimates*



December, 2006



LAND USE LEGEND

-  SINGLE FAMILY (R1)
-  RESIDENTIAL (R2)
-  LOW DENSITY RESIDENTIAL (R3)
-  RESIDENTIAL RESORT (RR)
-  SPECIAL RESIDENTIAL RESORT (SRR)
-  COMMERCIAL (C1)
-  SPECIAL WETLAND AREA (SA)
-  WATERFRONT DEVELOPMENT (WD)
-  RESIDENTIAL MANUFACTURED DWELLING (RMD)
-  OPEN SPACE (OS)

The population data is in Table 2-3, however, only includes permanent residents living within the Rockaway Beach city limits. The population for the City's water system is greater than the estimated population of the City of Rockaway Beach, as the water system serves the City, areas outside of the City but within the UGB, and a development southeast of the UGB. In addition, the area has a high summer transient and part-time population, greatly increasing the population of the City in the summer. Many of the homes within the City and surrounding area are vacation rental homes or second homes. Due to this, the true summer population for the water system users is not reflected in the estimated populations by the Census or the Population Research Center. The 2010 Census shows that only 38% of the total housing units are being occupied by permanent residents. From these numbers it can be assumed that approximately 62% of the housing units within the City are occupied by a transient population that are not included in Rockaway Beach's population estimate.

There is no available data on the entire population within the City's UGB limits. Therefore, in order to estimate this population, the following assumptions have been made:

- Population characteristics developed by the 2010 US Census for the City of Rockaway Beach may be used to describe the UGB population;
- The occupancy rate of 38% is constant within the UGB and does not vary over time;
- The estimate of 1.9 people per household provided in the Rockaway Beach Comprehensive Plan is also constant; and
- Each residential account equates to 1 household.

Based on the above assumptions the following equation can be used to estimate the part-time population within the City's UGB and water service limits:

$$\text{Part-time Population} = (\# \text{ of Residential Meter Accounts}) \times (1.9 \text{ people/household}) \times (62\%)$$

This means that the current part-time population is estimated to be approximately 3,013.

2.2 WATER CUSTOMERS SERVED

The City of Rockaway Beach relies heavily on tourism as its economic base. There is no reliance on other traditional coastal industries such as fishing, agriculture, or forestry. The height of the tourist season occurs in the summer. During the summer, tourists enjoy the local beaches and lakes and increase commercial patronage of retail businesses, restaurants, and motels. In addition, single family rental properties and summer homes are filled.

As of 2016, the City of Rockaway Beach provided water service to 2,398 residential accounts, 96 commercial accounts, and 5 other accounts for a total of 2,499 customer accounts. The total number of accounts has steadily increased between 2003 and 2016. Residential accounts currently outnumber commercial accounts by a margin of approximately 25 to 1.

Water Sales

The City bills its water customers on a bi-monthly basis. Water consumption records from the most recent WMP are summarized in the following table for years 2004-2018.

Table 2-4 - Summary of Recent Water Consumption

Year	Annual Water Consumption (gallons)	
	Residential	Non-residential
2004 ¹	73%	27%
2005 ¹	71%	29%
2006 ¹	71%	29%
2011	93%	7%
2012	94%	6%
2013	Data not available due to software change	
2014		
2015 ²	84%	16%
2016	47%	53%
2017	49%	51%
2018	83%	17%
2004 - 2012 Average	80%	20%
2016 - 2018 Average	60%	40%

¹Based on data from 2009 WMP

²Data is only available for 6/30/15-12/31/15

As Table 2-4 shows, overall water sales distribution has varied over the past decade. The system goes through phases of high commercial use and low commercial use. This effects the percentages of water used for residential vs. non-residential. In recent years, the residential use has remained approximately the same, but non residential usage was significantly greater in 2016/2017 than it was in 2015/2018. Due to this large annual variability, it is possible there was a change in some designations between years within the billing software. It is also possible that this variability actually occurred due to the nature of water use in the community especially with such a large percentage of the population that are not full time residents.

Although residential users typically consume to largest portion of customer demand, the commercial use rate (gal/day/connection) is significant. These use rates are the result of Rockaway’s tourist economy and the large number of homes in the area which are not occupied year long. It can be assumed that these unoccupied houses drastically skew residential and overall use rates of the City’s water system.

According the the most recent water master plan and approximated full-time population in Rockaway Beach’s UGB, per capita usage has equaled approximately 167 gallons per capita per day (gpcd). The average per capita consumption in Oregon is about 111 gpcd¹. This makes sense because the 167 gpcd does not include the seasonal population increase.

¹ AWWA Water Distribution Systems Handbook, Larry W. Mays, 2000. Table 3.1

2.3 SUMMARY OF RECENT USE

Water demand is the volume of water delivered to the system over a period of time to meet the needs of consumers and to supply the needs of firefighting and system flushing. Additionally, virtually all systems have a small amount of leakage that cannot be economically removed so total demand usually includes some leakage. The difference between the amount of water sold and the amount delivered to the system is attributed to flushing, leakage, firefighting, other non-metered usage, and leakage. Demand varies seasonally with the lowest usage in winter months and the highest usage during summer months. Variations in demand also occur with respect to time of day (diurnal) with higher usage occurring during the morning breakfast and early evening periods and lowest usage during nighttime hours.

The objective of this section is to determine the current water demand characteristics. Current water demand will be used to project future demand requirements that will establish system existing water source adequacy. Water demand is described in the following terms:

Average Annual Demand (AAD) - The total volume of water delivered to the system in a full year expressed in gallons. When demand fluctuates up and down over several years, an average is used.

Average Daily Demand (ADD) - The total volume of water delivered to the system over a year divided by 365 days. The average use in a single day expressed in gallons per day.

Maximum Day Demand (MDD) - The largest volume of water delivered to the system in a single day expressed in gallons per day. The water supply, treatment plant and transmission lines should be designed to handle the maximum day demand.

Plant production records were analyzed as part of the recent water master plan. The meter for the plant is after the clearwell pumps to the system and includes water from the City's East and West wells. Therefore, this data does not include the water that is treated and used for backwash or water from Manhattan Well.

Data is not available for the exact amount of water that has recently been used for backwashing, therefore, it has been assumed that each backwash cycle has used 3 feet of water from the clearwell, equating to approximately 9,100 gallons. This data, along with production records from Manhattan Well meter were combined with the treatment plant records to determine overall system production.

The annual, daily, and seasonal usage rates were determined based on the total system production, allowing water loss to be included as part of the system demand. Although this results in higher usage rates compared to actual customer use, it is necessary to include system loss to provide an accurate picture of what the system must produce to meet customer demand.

Average Annual Demand

Records from 2011 to 2017 show an average annual water production of 105.5 million gallons (Table 2-5). During that time period water production decreased 9.5%. The decrease in annual usage from 2011 to 2017 is likely in part associated with the reduction of unaccounted water within the system. See Section 2.7 for further discussion and system efficiency and water loss.

Table 2-5: Water Demand (2011 through 2017)

	2011	2012	2013	2014	2015	2016	2017	Average
Annual Demand (MG)	117	102	98	96	106	114	106	105.5
Average Daily Demand (mgd)	0.320	0.278	0.268	0.263	0.290	0.312	0.290	0.289
Maximum Daily Demand(mgd)	0.634	0.758	0.644	0.635	0.672	0.846	0.607	0.685

Average daily demand (ADD) and maximum daily demand (MDD) have fluctuated throughout the period. This is likely due to the variable nature of the water use based on non-permanent users.

2.4 SOURCE OF SUPPLY

Prior to 1975, the City drew water from five surface water sources: Jetty Creek, Steinhilber Creek, McMillan Creek, Rock Creek and Heitmiller Creek. Water was chlorinated and discharged into the distribution system without the benefit of any additional treatment. Of the five original surface water sources, only Jetty Creek continues to serve the City. In addition to Jetty Creek, the City has also developed three wells in the Nedonna Beach aquifer. These current sources combine to allow the City to withdrawal up to 1248 gpm, however pump capacities at these sources limit the maximum withdrawal rate.

Summary of Existing Sources

a) Surface Water - Jetty Creek

Jetty Creek is located north of the City and provides the majority of water for the Rockaway Beach UGB service area. Water Right Permit Number S46245 allows the City to withdraw up to 1.0 cfs (448 gpm) from Jetty Creek. The water rights for this source has not yet been perfected by the City. This right was recently transferred.

The raw water intake currently is located on Jetty Creek in Township 2N, Range 10W, Section 17 NE SE. The raw water intake consists of a fish screen that leads to an off channel raw water impoundment. At the downstream end of the raw water impoundment is a low concrete dam that directs raw water to the intake line to a duplex pump station

The intake currently used was installed recently as part of a multi-function project to lower turbidity in the City’s raw water and provide fish passage around a previously impassible structure. The raw water pump station delivers the raw water to the City’s water treatment facility located adjacent to the pumping station. Each pump in the station is capable of 450 gpm.

b) Ground Water - Well No. 1 (West), Well No. 2 (East) & Well No. 3 (Manhattan Well)

All wells tap the same aquifer. The Nedonna Beach aquifer may be identified as “unconfined” in the parlance of hydrology because it is in beach sands. This category assumes greater risk of contamination from surface influences than a confined aquifer. The risk may be further compounded because the aquifer is shallow.

West Well & East Well

In 1980, two 8-inch wells were drilled approximately 50 feet southwest of the Jetty Creek source in Township 2N, Range 10W, Section 17 SW SE. Water Right Permit Numbers G9365 issued for

Well No. 1 (West) and Well No. 2 (East) allows withdrawal up to 175 gpm from each well for a combined flow of 350 gpm.

The west well has a 7.5 hp Byron Jackson well pump. This well provides good quality water. The water is high in pH, which is used to offset the use of Soda Ash at the plant. The west well pump house is a small enclosure that prevents City personnel from gaining access to the pump and pump controls. The City has mentioned that the well needs a building and the controls need to be relocated.

The east well is currently not in use. When this well is used, it causes problems with blue/green water at the treatment plant and the polymer stops working. This well has also had issue associated with saltwater intrusion.

Manhattan Well

In 2001/2002 an 8-inch well was drilled at the Manhattan Beach State Wayside, located near the intersection of US 101 and Beach St in Township 2N, Range 10W, Section 20 SE SW. The well was drilled to a depth of 65 feet. Water Right Permit Number G15325 allows the City withdrawal up to 100 gpm. The well's pump is capable of 70 gpm. This well also has poor water quality and is only used to supplement the City's supply during emergencies. The water right for this source has not been perfected by the City.

Summary of Water Rights

In addition to the active sources identified above, the City has water rights on several other surface water sources that have either been abandoned or have never been developed. A summary of all of the City's water right certificates and permits are listed in Table 2-6.

Table 2-6: Summary of Rockaway Beach Water Rights

Appl.	Permit	Cert / Trans.	Source	Use	Priority Date	Permitted Max Rate CFS (GPM)	Actual Diversions				Authorized Cert. Date	Limits
							Max Annual (MG)	Max Rate (GPM)	Ave ³ Monthly (MG)	Ave ³ Daily (GPM)		
S61833	S46245	/ T11986	Jetty Creek	M	6/24/1981	1 ¹ (448)	146 (1989)	448	9.73	222.1	10/1/2020	Flow
S21838	S17176	26097	McMillan Creek	M	7/31/1946	0.26 (116)	No Water Use				Completed	None
S31294	S25396	30421	McMillan Creek	M	3/17/1958	0.26 (116)	No Water Use				Completed	None
S33260	S26296	30423	McMillan Creek	M	7/30/1959	0.5 (224)	No Water Use				Completed	None
S1785	S925	2201	Heitmiller Creek	D	10/18/1911	2.5 (1,120)	No Water Use				Completed	None
S37408	S27861	38987	Heitmiller Creek	M	2/16/1962	0.5 (224)	No Water Use				Completed	None
S2085	S1081	936	Spring Creek Steinhilber Creek	M	2/15/1912	0.5 (224)	No Water Use				Completed	None
S153	S51	2386	Rock Creek	D	6/28/1909	5.0 (2,240)	No Water Use				Completed	None
G9809	G9365	82449	Jetty Creek (West Well)	M	6/10/1981	0.78 ² (350)	50.9 (2006)	150	1.1	24.3	Completed	Water Quality
G9809	G9365	82449	Jetty Creek (East Well)	M	6/10/1981	0.78 ² (350)	25.5 (2003)	150	No Recent Water Use		Completed	Water Quality
G15716	G15325	None	A well in McMillan Creek Basin (Manhattan Well)	M	2/28/2002	0.156 ⁴ (70)	3.8 (2003)	70	0.32	7.3	10/1/2007	Water Quality

¹These water rights were combined in a transfer. A total of 2 cfs is available.

²These two wells can supply a total of .78 cfs regardless of which one is running.

³This was taken from the most recent year only.

⁴This right is in the process of being extended. At the current time, only 0.156 cfs has been put to beneficial use. Currently, green light water is not being requested due to physical limitations at the well, so only 0.156 cfs is available for use until green light water is requested in a future WMCP. The full permitted amount is 0.223 cfs.

Production

Monthly water diversions from each source are reported annually to the State Water Resource Department per OAR 690-86 and were used to determine annual production for each source. The reporting periods for these records are over the course of a water year, or October 1 through September 30.

Water use records show that Jetty Creek represents 96% of the average annual diversions from October 2013 through September 2016 (Table 2-7). The West Well also provides a large quantity of the City’s water supply, approximately 25% on average. The lack of ability to use the East Well was offset by increased production in Jetty Creek and the West Well. Use of Manhattan Well has been marginal since its development in 2002.

Table 2-7: Water Source Diversion from Water Year 2013 through 2016

Annual Diversion (million gallons)	Water Year (Oct-Sept.)				
	WY 2013	WY 2014	WY 2015	WY 2016	Average
Jetty Creek	98.24	89.58	104.17	116.75	102.19
West Well	0	0.76	0	12.79	3.39
East Well	0	0	0	0	0
Manhattan Well	NA	0	0	3.83	1.28
Total	98.24	90.26	104.17	133.37	106.86

Source Adequacy & Reliability

As noted in Section 2.3, average annual water demand is 0.289 mgd (201 gpm) and the average peak day demand is 0.685 mgd (476 gpm). Water rights and pumping capacity from the Jetty Creek and the three wells allow 1,248 gpm of water to be diverted to the City’s water system. This is over 6 times the average annual use and 2.6 times the average peak day demand. However, limitations in source reliability, water quality, and infrastructure prevent the City from withdrawing the full capacity of their water rights. Although the City has never experienced significant water shortages, the reduced quantity of water available for production caused by these limitations has made it difficult for the City to meet water demand during periods of high usage.

Flow Restrictions

There are several streamflow dependent species in Jetty Creek that have been identified by the Oregon Department of Fish and Wildlife (ODFW) and US Fish & Wildlife as sensitive or threatened. These include:

- Chinook Salmon (fall) – listed by ODFW as a sensitive-critical species
- Chum Salmon – listed by ODFW as a sensitive-critical species. Historically this species has been present, however, it may or may not current in Jetty Creek.
- Coastal Cutthroat Trout – listed by ODFW as a sensitive-vulnerable species.
- Coastal Steelhead – listed by ODFW as a sensitive-critical species.
- Coho Salmon – listed federally as a threatened species and by ODFW as a sensitive-critical species

- Millicoma Dace – listed by ODFW as a sensitive species
- Pacific Lamprey – listed by ODFW as a sensitive species
- Western Brook Lamprey – listed by ODFW as a sensitive species
- Western River Lamprey – listed by ODFW as a sensitive species

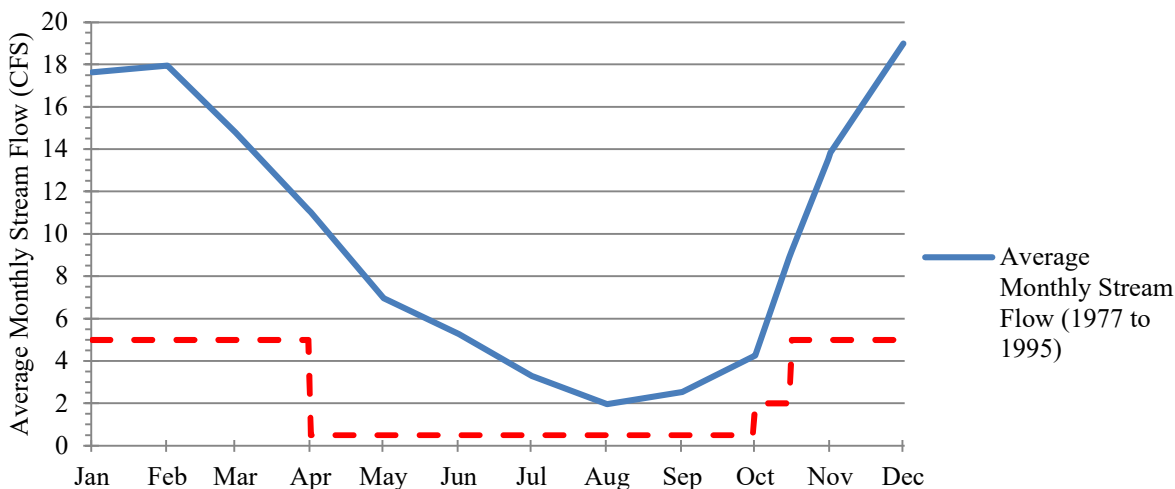
In 1968, legislation was passed to allow minimum stream flow requirements to be established in some reaches of rivers and streams in Oregon to protect fish and other wildlife. An in-stream water right to support aquatic life was established for Jetty Creek by Oregon Water Resource Department (OWRD) to ODFW in May of 1981 (Certificate 59625). The ODFW water right is junior to the City’s 1969 water right on Jetty Creek but senior to its 1981 water right. As a result, the City cannot withdrawal its full water right from Jetty Creek unless the minimum flow requirement for aquatic life is achieved. The minimum flow requirements and seasonal time frames are shown in Table 2-8.

Table 2-8: Seasonal Minimum In-Stream Water Rights

Time Period	Minimum Flow (CFS)
Oct 1 - Oct 15	2.0
October 16 – March 31	5.0
April 1 – September 30	0.5

Hydrologic data for Jetty Creek were obtained from the Oregon State Water Resources Department. The gauging station (Gauge: 14301250) on Jetty Creek is located 300 feet upstream of the City’s water treatment plant. The period of record reviewed dated from 1979 to 1995. Unfortunately, in 1995 the station was removed and not replaced, so there is no available data since then. Since this is the best data available, it was used for the analysis. The average monthly stream flows for Jetty Creek were determined and plotted along with the minimum seasonal fish flow requirement (Figure 2-3).

Figure 2-3: Average Monthly Jetty Creek Stream Flow (1977 to 1995)



On average, stream flows in Jetty Creek are sufficient to meet the City’s senior water right and in-stream water right for fish passage. However, the average flows from July through September are not adequate to allow the City to withdrawal the full capacity of their junior water right. August has the lowest average daily stream flow of 1.96 cfs. Moreover, daily stream flows are routinely less than the in-stream water right

for fish passage and in some cases even less than the City’s senior water right allocation. Minimum historical stream flow is 0.57 cfs or 255 gpm.

The reliability of Jetty Creek meeting various water rights was determined by finding the percent of daily stream flows that met specific conditions (Table 2-9). This analysis determined that the period from October 1 to October 15 is when the source is least reliable. However, this period is after the peak tourist season and therefore water demand from the City is lower. During peak tourist season, there is a 65% probability that the City will have access to its full 2.0 cfs from Jetty Creek.

Table 2-9: Percentage of Daily Flow Meeting Water Right Conditions

	Meet Senior Water Right	Meet Junior Water Right
Oct 1 - Oct 15	26%	20%
October 16 – March 31	81%	76%
April 1 – September 30	84%	65%

The documented low stream flows during August, September and October coupled with ODFW’s minimum water right of 0.5 cfs clearly limits the available of Jetty Creek during low flow periods.

Water Quality Limitations

There are several water quality issues that have limited the use of water sources. These issues include high total organic carbon (TOC) concentration, salinity, turbidity and fecal coliform.

a) Total Organic Carbon

TOC is a concern in drinking because when they are exposed to chlorine, disinfection byproducts are formed, namely the chemicals haloacetic acids (HAA5) and total trihalomethane (TTHM). These chemicals have been linked to health problems which have led to concentration limitation of both in drinking water. The existing plant does not remove TOC to a level adequate to consistently reduce TTHMs to below the threshold level (due to undersized coagulation and settling components). Therefore, Rockaway Beach has a compliance history with TTHMs.

In recent testing it was discovered that the Nedonna and Manhattan Beach wells have concentrations of TOC **HIGHER** than Jetty Creek. This is a problem for the treatment plant, because it was previously thought that running the wells would help due to lower TOC numbers.

b) Salinity

Salinity has been measured by elevated conductivity in the East Well. The well is some 325 feet from McMillan Creek and elevated conductivity readings occurred simultaneously with ten-foot tides and the influx of salty Nehalem estuarine waters into McMillan Creek. Increased salinity in the East Well could also affect the West Well in the future.

c) Turbidity

Turbidity removal is a measurement of the ability of a treatment plant to remove harmful organisms form the water. The water treatment plant was originally designed to meet treatment levels much less stringent than today’s standards. The most significant design deficiency is the undersized tub settlers.

Winter storms increase sediment runoff into Jetty Creek. Also, the higher streamflows in winter agitate settled particles at the bottom of the streambed and re-suspend them in the water. These actions result in increased turbidity in the water of Jetty Creek. Turbidity is removed via settlement mechanisms, which are primarily dependent on time and space to settle particles. Since the space available for settlement is fixed, operators must increase the time for settlement and therefore the production rate is decreased.

d) *Fecal coliform (RM 0-1.8)*

Fecal coliforms are the group of the total coliform bacteria that are considered to be present specifically in the gut and feces of warm-blooded animals. Because the origins of fecal coliforms are more specific than the origins of the more general total coliform group of bacteria, fecal coliforms are considered a more accurate indication of animal or human waste than the total coliforms. Most coliform bacteria do not cause disease. However, some rare strains of *E. coli* can cause serious illness.

In recent testing, total coliform was found to be present in the West Well.

Infrastructure Limitations

In addition to the water quality issues that are related to infrastructure deficiencies, the plant capacity is also an issue. The treatment plant is currently rated at 1.15 million gallons per day (gpd), however the maximum production at the treatment plant is limited by several factors, including filter performance deterioration. According to the map at located at the following link, all of the City's water sources are located outside the Critical Groundwater Area.

<https://www.oregon.gov/OWRD/programs/GWWL/GW/Documents/GWAdminAreasMap.pdf>

2.5 FACILITIES DESCRIPTION

Source/Treatment

The location of the water treatment plant, Jetty Creek intake, and wells is shown in Figure 2-4, "System Schematic". The original water treatment facility was constructed in 1975. In 2011, the conventional filtration system was replaced with a packaged ultramembrane filtration system. Raw water from Jetty Creek is pretreated using chemical injection and pressure filters, then pumped to one of two membrane filtration skids for treatment. Filtered water is then disinfected using sodium hypochlorite and discharged to the clearwell. Discharge pumps convey water from the wetwell to the McMillan Reservoir.

Water from the West and East wells can be either discharged into the raw water pump station or bypassed directly to the treatment plant clearwell. However, water from these wells is normally routed through the water treatment plant. The wells are used to supplement the Jetty Creek source and also elevate the finished water pH to reduce the corrosivity of the water. The water from the Manhattan well is injected with chlorine and pumped directly into the distribution system. The well is primarily used for emergency and peak use.

Transmission/Distribution

The transmission and distribution systems consist of approximately 31 miles of pipe 2 inches in diameter and larger. Table 2-10 identifies the approximate quantity, size and type of pipe in the system.

Approximately 69% of the distribution lines are PVC, 1% HDPE, 30% are asbestos-cement (AC), and the remaining 0.3% are steel pipes. Distribution lines are shown Figure 2-4.

Table 2-10: Transmission and Distribution System Inventory

Pipe Size (inches)	Length (feet)				
	PVC	AC	HDPE	Steel	Total
2"	---	---	---	600	600
4"	24,000	29,400	300	---	53,700
6"	22,700	7,600	400	---	30,700
8"	43,200	12,100	600	---	55,900
10"	12,700	---	400	---	13,100
12"	10,800	---	---	---	10,800
Totals	134,030	49,695	1,800	600	164,8

Pump Stations

The City has pump stations at water source intakes, treatment plant clearwell, and storage tank booster pump stations. Table 2-11 summarizes the City’s pump stations and capacities. As previously noted, pump capacity for the City water intakes have a combined capacity of 1270 gpm.

Table 2-11: Summary of Pump Stations

Pump Station	Pump Capacity (GPM)
Jetty Creek (x2) ¹	450
West Well	150
East Well	150
Manhattan Well	70
Clearwell ¹	1100
Pacific View Estates	50
3rd Ave. Booster Pump (x2) ²	200
Rock Creek Booster Pump	200

¹ Pumps may operate simultaneously.

² Pumps only operate alternatively.

Pressure Zones

Due to the topography of the service area, the distribution system is divided into five pressure zones: the Scenic View Pressure Zone, Third Avenue Pressure Zone, Rock Creek Pressure Zone, Pacific View Pressure Zone, and Nehalem and Ocean Street Pressure Zone (Table 2-12).

Table 2-12: Pressure Zone Service Areas

Pressure Zone	Area (acres)
Scenic View	931
3 rd Avenue	97
Rock Creek	14
Pacific View	55
Nehalem & Ocean Street	396

Treated Water Storage

The City of Rockaway Beach has three storage reservoirs, McMillan Creek Reservoir, Third Avenue Reservoir, and Pacific View Estates Reservoir (Table 2-13). A fourth reservoir, Scenic View, was recently taken off-line. The three existing reservoirs have a combined usable storage volume of 3.07 million gallons. Finished water storage locations are shown in Figure 2-44.

Table 2-13: Finished Water Storage Summary

Reservoir	Storage (gallons)	Overflow Elevation (ft)
McMillan Creek	1,900,000	166
Third Avenue	1,000,000	241
Pacific View Estates	170,000	420

a) McMillan Creek

The McMillan Creek Reservoir is the City’s newest water storage reservoir, constructed in 2009 to replace the degraded Scenic View Reservoir. The new 95 foot diameter reservoir is a glass-fused steel reservoir with a total volume of nearly 2 million gallons. Overflow from the reservoir is at 166 feet with base elevation is 129.66 feet and maximum tank water depth is 36.34 feet. The reservoir provides approximately 55,036 gal/ft of storage. The reservoir is located in the lower pressure zone on roadway right-of-way easement east of Highway 101 in the north section of the City of Rockaway Beach. The reservoir is filled by the water treatment plant clearwell treated water pumps.

b) Third Avenue Reservoir

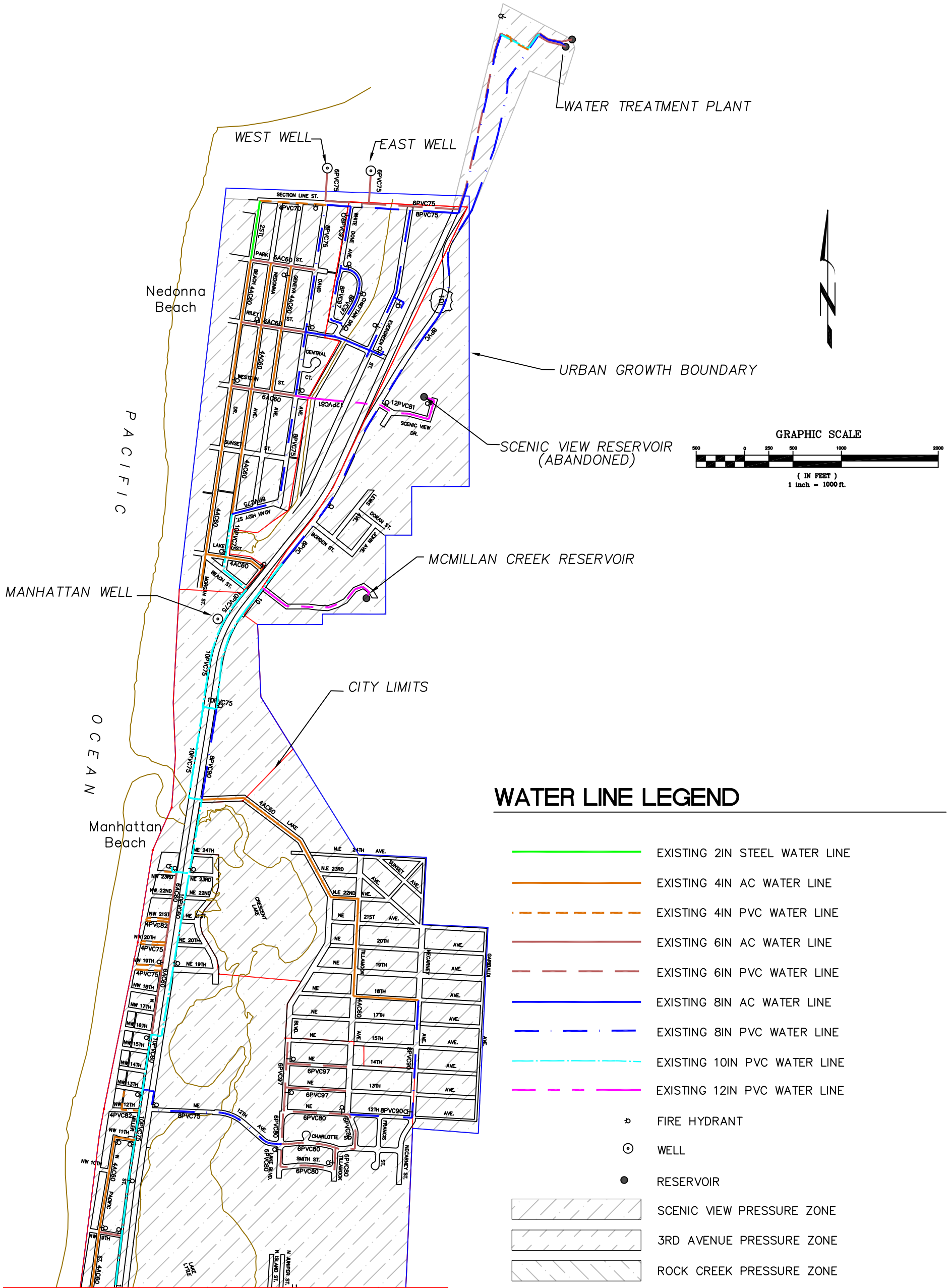
In 1975, a 1.0 million gallon reservoir was constructed on Third Avenue east of Palisade Street. The overflow elevation from the reservoir is 241 feet above sea level. The base elevation is 206 feet and maximum tank water depth is 35 feet. The diameter of the tank is 70 ft. The reservoir provided approximately 28,800 gal/ft of storage. The reservoir is filled by the Third Avenue pump station.

c) Pacific View Estates

A third reservoir is located southern area of the City in Pacific View Estates. This 170,000 gallon concrete reservoir constructed in 1978 is located at an elevation of 400 feet with an overflow elevation of 420 feet. The diameter of the reservoir is 38 feet. The tank provides approximately 8,500 gal/ft of storage. Water is delivered to the reservoir by the Rock Creek Pump Station.

d) Scenic View Reservoir

There were a variety of problems with the Scenic View Reservoir since its construction. Due to its elevation, water pressure in the lower distribution systems drops to below an acceptable level if the reservoir is drawn down more than halfway. This made use of the lower portion of the reservoir volume questionable under extreme demand conditions such as fire flow. The reservoir also had significant leakage from damaged sustained during construction of the tank. The City attempted to seal the leak on several occasions, but these attempts were not proven successful. Due to these problems, the City took the Scenic View Reservoir off-line in the summer of 2008.

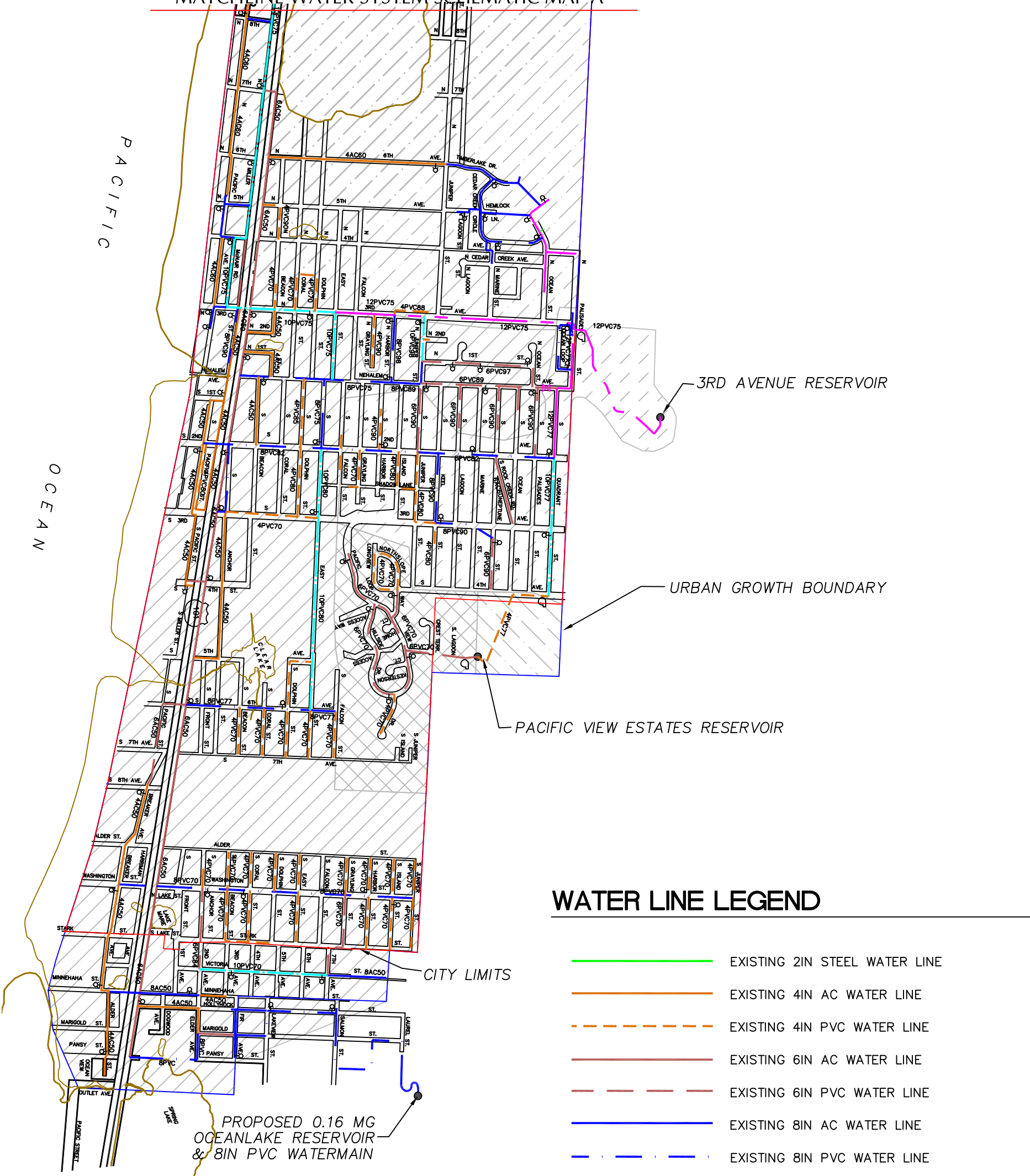


WATER LINE LEGEND

- EXISTING 2IN STEEL WATER LINE
- EXISTING 4IN AC WATER LINE
- - - EXISTING 4IN PVC WATER LINE
- EXISTING 6IN AC WATER LINE
- - - EXISTING 6IN PVC WATER LINE
- EXISTING 8IN AC WATER LINE
- - - EXISTING 8IN PVC WATER LINE
- · - · EXISTING 10IN PVC WATER LINE
- - - EXISTING 12IN PVC WATER LINE
- ⊕ FIRE HYDRANT
- ⊙ WELL
- RESERVOIR
- SCENIC VIEW PRESSURE ZONE
- 3RD AVENUE PRESSURE ZONE
- ROCK CREEK PRESSURE ZONE
- PACIFIC VIEW PRESSURE ZONE
- NEHALEM AVE & OCEAN ST PRESSURE ZONE

MATCHLINE WATER SYSTEM SCHEMATIC MAP B

MATCHLINE WATER SYSTEM SCHEMATIC MAP A

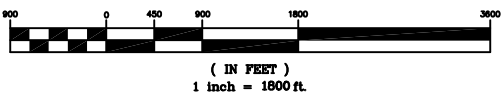


WATER LINE LEGEND

- EXISTING 2IN STEEL WATER LINE
- EXISTING 4IN AC WATER LINE
- EXISTING 4IN PVC WATER LINE
- EXISTING 6IN AC WATER LINE
- EXISTING 6IN PVC WATER LINE
- EXISTING 8IN AC WATER LINE
- EXISTING 8IN PVC WATER LINE
- EXISTING 10IN PVC WATER LINE
- EXISTING 12IN PVC WATER LINE
- FIRE HYDRANT
- WELL
- RESERVOIR
- SCENIC VIEW PRESSURE ZONE
- 3RD AVENUE PRESSURE ZONE
- ROCK CREEK PRESSURE ZONE
- PACIFIC VIEW PRESSURE ZONE
- NEHALEM AVE & OCEAN ST PRESSURE ZONE



GRAPHIC SCALE



2.6 INTERCONNECTIONS

The City of Rockaway Beach does not have any interconnections with other water utilities within the region. The unincorporated areas of Nedonna Beach and portions of Twin Rocks are served as part of the City’s UGB.

2.7 SYSTEM EFFICIENCY

Unaccounted water is the quantity of water that is produced, but not accounted for by water sales. This quantity includes authorized, unmetered uses and water loss. Authorized unmetered water uses include system flushing, backwashing, and construction. Water loss may be through physical sources, such as system leaks, or non-physical sources including water theft or meter inaccuracies.

A comparison between water production and the City’s water sales shows that there is a significant quantity of unaccounted water loss within the system.

As Table 2-14 shows, the percent of unaccounted water has been fluctuating, but is generally less than it was in the last WMCP. A major leak was discovered and repaired in October 2016. After the repair, unaccounted water in the system decreased to under 24% of total production for the year of 2017.

Table 2-14 Water Sales (MG) & Unaccounted Water as Percent of Annual Production

	2009 WMP	2011	2012	2013	2014	2015	2016	2017
Total Water Production	143	117	102	98	96	106	114	106
Water Sales & Other Metered Uses	72	55	55	64	78	79	73	81
Unaccounted Water	71	62	47	33	18	27	41	25
Unaccounted Water as a Percentage of Total Production	49.8%	53.0%	46.0%	34.6%	18.5%	25.5%	35.9%	23.4%

System leaks, distribution flushing, meter inaccuracies, backwash water, other unmetered water uses, and meter inaccuracies cause production quantities to be higher than consumption quantities. The following sources have been identified by the City to contribute to the volume of unaccounted water:

- Backwashing is not currently metered, so this value can only be estimated
- System flushing through fire hydrants is conducted periodically but water quantities used for this are not know
- Some older asbestos (AC) cement pipes are suspected to be leaking.

Also, approximately half of the customer water meters in Rockaway Beach were installed over 25 years ago. Since these meters are mechanical devices, their accuracy decreases over time. Many Cities replace meters every 10 to 15 years to keep inaccuracy of meter readings within acceptable limits. The amount of apparent water loss due to inaccurate meters is unknown.

System Leakage

System leakage does not include unmetered usage, such as backwashing, or hydrant testing, unauthorized meter use, or meter inaccuracy. The major source of system leakage identified for the City are expected leaks in the City's AC pipes.

a) Asbestos Cement Pipes

Approximately 30% of the system's distribution pipes are asbestos cement. These pipes were installed nearly 50 years ago and are reaching the end of their useful life. Asbestos cement pipe is very brittle and it is likely that many of these lines are leaking, especially where there is heavy traffic loading, such as under Highway 101. The quantity of water loss due to leaking AC pipes could be significant. In 2015 the City replaced approximately 1300 feet of asbestos water main beneath Highway 101, and will continue to replace old AC mains going forward.

OAR 690-086-0150(4)(e) requires any system to implement a regularly scheduled and systematic leak detection program if water loss exceeds 10% of total water diversions. Furthermore, a line repair and replacement program must also be developed for suppliers requesting additional water rights and whose system's water losses is greater than 15%. Although the exact percentage of water loss occurring in the Rockaway Beach system is not precisely know, with unaccounted for water percentages above these for all analyzed years, it is assumed that the City will need to comply with both of these requirements. See Section 3 (*Water Conservation Element*) of this plan for more information on leak detection and line repair and replacement programs. As more months go by after the October 2016 line repair, the system may fall below the 15% mark. This should be continued to be monitored.



Section 3

Water Conservation Element



Element 2: Water Conservation Element

The Oregon State Water Resources Department (WRD) reviews water management and conservation plans (WMCP) based on the requirements found in OAR 690-086-0150. This section requires all water suppliers to implement specific conservation elements, such as annual water audits, full metering of system, and public education. Other measures listed under 690-086-0150 are only required for suppliers who serve a population over 7,500, or if a smaller supplier is proposing to expand or initiate diversions under an extended permit for which water resource issues have been identified. This section, Conservation Element, details all conservation elements required by the WRD that are appropriate for the City's characteristics. Table 3-1 lists all measures required by OAR 690-086-0150 and where each element is found within this document.

Table 3-1: Water Conservation Element Requirements

Requirement	OAR Reference	Section
Progress report on implementation of conservation measures	690-086-0150 (1)	3.1
Water use measurement and reporting program	690-086-0150 (2)	3.2
Currently implemented conservation measures	690-086-0150 (3)	3.9
Annual water audit	690-086-0150 (4)(a)	3.5
Full metering of systems	690-086-0150 (4)(b)	3.3
Meter testing and maintenance program	690-086-0150 (4)(c)	3.3
Rate structure	690-086-0150 (4)(d)	3.4
Leak detection program	690-086-0150 (4)(e)	3.6
Public education program	690-086-0150 (4)(f)	3.7
System leakage reduction program <15%	690-086-0150 (5)	3.8
System leakage reduction program <10%	690-086-0150 (6)(a)	3.6
Technical and financial assistance programs	690-086-0150 (6)(b)	3.8
Retrofit/replacement of inefficient fixtures	690-086-0150 (6)(c)	3.8
Rate structure and billing practices that encourage conservation	690-086-0150 (6)(d)	3.8
Reuse, recycling, non-potable opportunities	690-086-0150 (6)(e)	3.8

3.1 CONSERVATION PLANNING

Traditional water management planning focused on the development of new water supply sources to accommodate increased water demand. This supply-side planning approach has often viewed water conservation as a temporary response to an emergency or drought situation only. However, current water management planning practices put water conservation on equal footing with new water supply projects as potential water sources.

Water conservation consists of any beneficial reduction in water losses, waste, or consumption. As water providers face increasing demands on their limited resources, conservation planning is playing

an increasingly important role in management practices. Water that is conserved, in effect, becomes a new and relatively inexpensive source of water.

Conservation can have the effect of helping water providers avoid, downsize, or postpone water and wastewater expansion projects. Capital costs, maintenance costs, financing costs, and many other expenses may be reduced by effectively practicing conservation within the water system. Additional benefits for the environment include: restoring streamflows to support aquatic life, providing recreational opportunities, and maintaining water quality. The investment that water system managers make in conservation planning will yield savings that can be measured in terms of reclaimed water resources and the related operating dollars.

Water providers are in the business of making and selling water. Revenue from the sales of water allows the utility to pay expenses, retire debts for system development loans, and plan for future water production facilities. Some providers may view conservation as an activity that is contrary to the financial survival of their water system. However, practically every water system is capable of making changes in their operation that will result in reducing water lost and lower production costs. The result of conservation can be an increase in operating revenues and a decrease in unnecessary and wasteful expenses.

Water systems have a wide selection of specific conservation measures at their disposal. Some of the measures deal directly with the water provider while others are aimed at reducing the consumption levels of the water users. Appropriate conservation measures are selected on the basis of how well they meet conservation objectives; achieve water savings, program costs, and other implementation factors.

Objectives

The City has established the following objectives for this plan:

- Meet State requirements for WMCP;
- Improve management of the City's water sources;
- Minimize operational costs;
- Develop policies to decrease summer peak demands;
- Identify techniques and strategies to increase conservation by the City and public that lower overall system demand; and
- Increase customer satisfaction.

Previous Efforts

The City established its first official program to actively pursue conservation measures within the service area in the previous WMCP. Even before that, the City had carried out several activities which have reduced the system's water demand. These efforts had primarily focused on decreasing the amount of water loss within the system by repairing leaks. The largest known source of water loss was related to leaks in the treated water reservoirs.

Since the WMCP was approved in 2010, the City has been working on the benchmarks. An update from the last WMCP benchmarks is provided in the Table 3-2.

Table 3-2: Status of Benchmarks from 2010 WMCP

Benchmark	What has been done since 2010
Water use measurement reporting to OWRD	Annual Reporting
Water audit	Annual Record Keeping
Customer meter replacement program	Replaced as- needed & 400 meters were replaced due to available funding after 2010 plan.
Source meters calibration	Completed Annually
Replace Scenic View reservoir	This was completed in 2009. No further action is needed
Develop conservation web page	The City has not had the resources to start this yet
Distribute water conservation brochures	The City has not had the resources to start this yet
Publish conservation articles in the City's newsletter	This occurs 2-4 times per year
Post conservation signage	The City has not had the resources to start this yet
Radio and TV ads	The City has not had the resources to start this yet
Leak detection program	This was completed in 2010
Develop school conservation programs	The City has not had the resources to start this yet
Line repair & replacement program	This is an on-going effort
Technical assistance program	The City has not had the resources to start this yet
Provide indoor and outdoor retrofit kits	The City has not had the resources to start this yet
Replacement of inefficient fixtures in City buildings	This was completed in 2013
Incentive/rebate feasibility determination	The City has not had the resources to start this yet
Water Waste Ordinance consideration	The City has not had the resources to start this yet

In addition to repairing reservoir leaks, the City has also done the following:

- Contracted leak detection services;
- Repaired leaks in water main and distribution lines as they are located;
- Began replacing older, inefficient toilets and faucets with new intra-red activated fixtures at public facilities;
- Published educational information and conservation tips in the City’s newsletter.

A few of the benchmarks were not able to be achieved in the last 5 years. Small City budgets often prevent major changes from occurring quickly.

3.2 WATER USE MEASUREMENT AND REPORTING

The City of Rockaway Beach water use reporting is done in compliance with OAR 690-086. The report is submitted annually by December 31st on the form provided by the Oregon Water Resources Department using the “Flow Meter Method” approved by the Department in OAR 690-086-0015 (5).

Source meters are located at each well and the Jetty Creek diversion, which record cumulative water volume over the full range of discharge. Well meters are read and logged daily by City personnel. The

diversion meter for Jetty Creek is located at the water treatment plant and is read and logged monthly. There have been no withdrawals in the last 10 years that were not recorded and the reported monthly volumes are with plus or minus 15%.

3.3 METERING

The City's water system is fully metered and in compliance with OAR 690-086-0150 (4)(b) requirements. Full metering of the system includes meters at Jetty Creek and source wells and at all customer service connections. The City does not have interconnections with other supplier systems.

Meter Testing & Maintenance Program

a) Source Meters

The City's wells and Jetty Creek diversion are fully metered and have been since the current facilities were installed. The two year-old UltraMag electromagnetic meter at Jetty Creek is calibrated and inspected annually. The west and east wells have McCrometer meters. These meters are not normally calibrated, however if one is found to be malfunctioning it is immediately replaced. All meters are visually checked when read. If the reading obtained from the meter appears to be unusual, the meter reading is double checked by comparing it with another source to provide accuracy.

b) Customer Meters

The City installed turbine meters at all service connections when the system was initially metered in 1982. Four hundred meters were replaced with grant funding around 2010. Turbine water meters, being primarily mechanical devices in a relatively harsh environment, become damaged and inefficient as they age. The result of aging or poor quality meters is inaccurate meter readings. Old meters will typically read lower use quantities than are actually occurring. These inaccurate readings result in lost revenue, misleading information for water audits, more difficult leak detection, and other associated problems.

When a customer meter is suspected of being defective, City personnel remove the questionable meter and replace it with a new meter. The removed meters are then rebuilt and checked for accuracy. Defective meters are normally found when there are customer complaints or suspicious water bills. When either of these conditions is found, the meter is inspected. About half of meters used within the service area are over 34 years old.

Analysis of residential water sales indicated the estimated per capita water usage in Rockaway Beach is approximately equal to the average Oregon usage published by AWWA (See Section 2.2). Typically a small tourist community, such as Rockaway Beach would be expected to have higher water usage than the Oregon average, especially since the per capita usage does not include the seasonal and tourist populations in the area so water used by this sector should drive up the calculated full-time population usage.

If, as it is expected, the water usage in Rockaway higher per capita, water meters in the City are likely under-reporting consumption. This would increase the average water usage per residential account per month. Based on current water rates (see below), loss revenue due to inaccurate meters may be significant each year.

3.4 Rate Structure

The City’s rate structure includes a basic charge for water consumption up to 1,600 cubic feet. Once use exceeds 1,600 cubic feet there is a uniform-block rate structure for every additional 100 cubic feet of water consumed (Table 3-3). OAR 690-086-0150 requires municipal suppliers to have a rate structure that is based, at least in part, on the quantity of water metered at the service connection. The City meets this requirement.

Table 3-3: Water Service Fee Schedule

Customer Type	Basic Charge	Usage Over 1,600 Cubic Feet
City Accounts	\$ 63.40	\$ 2.40/100 CF
Rural Accounts	\$ 68.90	\$ 2.40/100 CF

The City currently bills customers on a bimonthly schedule. This billing frequency will not change in the foreseeable future. The City’s existing computer system and billing software do not permit providing customers with consumption history.

3.5 WATER SYSTEM AUDIT

As part of the OAR 690-086-0150 requirements, the City now conducts annual water audits. Water audits allow the City to itemize water use and are an effective way to estimate the severity of water loss within the system. These audits require detailed records of water flow into and out of the distribution system, usually based on past meter records.

Periodically, the City has compared the volume of water produced versus known water usage in an effort to estimate the amount of water loss within their water system. Since 2006, these audits have become more comprehensive to provided better accuracy. Due to the increased accuracy, the City has located and repaired major sources of loss. The audit performed for the most recent WMP revealed that unaccounted water was approximately 46% in 2012. A major leak was discovered in October 2016, after the repair, water loss dropped to less than 24% for 2017. Table 3-4 shows results from recent audits.

Table 3-4: Water Sales (MG) & Unaccounted Water as Percent of Annual Production

	2009 WMP	2011	2012	2013	2014	2015	2016	2017
Total Water Production	143	117	102	98	96	106	114	106
Water Sales & Other Metered Uses	72	55	55	64	78	79	73	81
Unaccounted Water	71	62	47	33	18	27	41	25
Unaccounted Water as a Percentage of Total Production	49.8%	53.0%	46.0%	34.6%	18.5%	25.5%	35.9%	23.4%

System leaks, distribution flushing, meter inaccuracies, backwash water, and other unmetered water uses cause production quantities to be higher than consumption quantities. The following sources have been identified by the City to contribute to the volume of unaccounted water:

- Backwashing is unmetered
- System flushing through fire hydrants is conducted annually in the spring, but water quantities used for this are not know;
- Some older asbestos cement pipes are suspected to be leaking at an unknown rate;
- Customer meter inaccuracies associated with old turbine meters;
- Illicit water uses do occur, the extent of which is unknown; and
- Incomplete record keeping of water used during City construction projects.

Known sources for unaccounted water may be characterized into four categories: (1) unmetered authorized use (back flushing, system flushing, and City construction); (2) unmetered unauthorized use (water theft); (3) apparent water loss (inaccurate meters); and (4) real water loss (system leaks). Of these unmetered authorized use is the easiest to quantify. In order to make system water audits more accurate and informative, the City will document estimates of unmetered authorized use for backwashing, system flush and construction water use. Table 3-5 summarizes methods that will be implemented to estimate these uses.

Table 3-5: Summary of Methods to Estimate Unmetered, Authorized Use

Source	Method to Estimate Water Use
Backwashing	Operators will use a flow meter on the backwash flow, located after the pump and just prior to the filters, to record flow rate and duration of each backwash cycle.
System Flushing	Crews responsible for line flushing will maintain logs of estimated volumes flushed (minutes time estimated flushing rate in gpm).
Construction	Contractors will have to maintain water use records as part of their construction contract.

The City’s Public Works Department is responsible for completing system audits for the previous year. This will give enough time for all billing records, production records, and estimates for unmetered authorized use for the previous year to be fully available. The audit will report all water diversions from the City’s sources, customer metered used, nonrevenue metered use, estimates of authorized unmetered use, and estimate of all know leaks. The remaining water will be characterized as unaccounted water. When an audit results in an unacceptable level of unaccounted volume of water, the City will take the appropriate steps to identify the source of unaccounted water. These steps may include testing customer meters and implementing a leak detection program. Annual audit reports will be submitted in WMCP progress reports and the next WMCP update in 2026.

3.6 LEAK DETECTION PROGRAM

Leakage occurs in different components of the distribution system: transmission pipes, distribution pipes, service connection pipes, joints, valves, and fire hydrants. In most cases the largest portion of unaccounted water is lost through leaks in supply lines. Causes of leaks include corrosion, materials defects, faulty installation, excessive water pressure, water hammer, and excessive loads and vibration from road traffic.

OAR 690-086-0150(5)(e) requires implementation of a regularly scheduled and systematic leak detection program when water loss exceeds 10-percent. Unaccounted water in Rockaway Beach’s water system was approximately 23.4% in 2017. Therefore, it is assumed that this requirement pertains to the City’s water system.

Previous Efforts

In 1995 and 1999, Utility Services Associates performed leak detection services for the City of Rockaway Beach. The 1995 study surveyed approximately 14 miles in the general area of Manhattan Beach, Nedonna Beach, Crescent Lake, and Lake Lytle. The 1999 study investigated approximately 10 miles of water lines, also in the north area of the water distribution system. The leak detection programs pinpointed the location of 8 major leaks in 1995 and 4 leaks in 1999 causing an estimated 7.62 and 2.23 million gallons of annual water loss, respectively. A summary of the results of these leak detection surveys is presented in the table below:

Table 3-6: Summary of Leak Detection Program Findings

Leak Type	1995		1999	
	Number of Leaks	Total Loss Rate (gpm)	Number of Leaks	Total Loss Rate (gpm)
Valves	3	1.5	0	0.0
Hydrants	2	1.0	2	1.0
Meter	0	0.0	1	0.2
Services	2	2.0	1	3.0
Other	1	10.0	0	0.0
Total	8	14.5	4	4.2

It should be noted that both leak detection surveys remarked on the limitations of the programs' effectiveness. The 1995 study reported that due to an extreme amount of transformer interference in the Manhattan and Nedonna Beach areas, there was a possibility that a quiet leak noise may have gone undetected. Observations noted in the 1999 survey included that due to the known poor sound conductivity of the plastic pipe, a "point-to-point" survey was necessary to ensure complete and comprehensive leak detection. However, a lack of sufficient connection points (e.g. water valves) prevented complete testing in some areas.

Another leak detection effort occurred in 2010, but the City reports no leaks were found. This could be attributed to a number of factors that cause leaks to not be found including those listed above. In October 2016, a major leak was found and repaired resulting in an estimated 1.4MG/month reduction in unaccounted for water.

Proposed Plan

In order to comply with State regulations, the City must develop and implement a regular and systematic leak detection program. Every 10 years, the City plans to have a new leak detection survey performed throughout the City. This will incorporate the entire system at once to better understand where the worst problems occur. This will aid in prioritizing repairs. Results of future leak detection testing will be presented in progress reports as well as the WMCP's 2026 update.

Furthermore, City should also utilize staff members, as well as the community, to identify and report leaks. The City will use flyers in its water billings to explain the importance of leak detection, describes visual signs of leaking pipes (e.g. surface pooling), and provide a contact to report leaks. City staff will also remain vigilant in looking for possible signs of leakage and report any problems, including monitoring production data and utility bills for major irregularities.

When leaks are located within the transmission or distribution system, the City should immediately repair and replace all the defective pipeline or fixtures as soon as it is financially feasible. Additionally,

the City should maintain a log listing the location of all known leaks, action taken to correct leak, cost of repairs and/or replacement, estimate rate of leakage, and any other pertinent information. For additional information on line repair and replacement program see Section 3.8.

3.7 PUBLIC EDUCATION

Public education and acceptance is critical to the success of any conservation program. Not only will an education program assist the public in changing their water-use habits, it will also affect how water consumers respond to a change in the water rates, increased billing amounts due to new and accurate water meters, or participation in water curtailment activities. Generally, customers that are informed and involved are more likely to support the water system's conservation planning goals.

A public education program is a required element of WMCP conservation element per 690-086-0150 (4)(f). The City has included information on conservation in the City's newsletter that is distributed bimonthly to customers with their water billing. In order to further heighten the community's awareness, the City will implement a comprehensive public education program focused on water conservation. This program will have two elements: (1) public outreach ad campaign and (2) school programs. Each of these measures will work in conjunctions with others to provide a holistic approach to public education.

Public Outreach Ad Campaign

Public outreach through various ad campaigns is an effective way to bring water conservation into the public's view. Many people are unaware of where their water comes from or understand it is a finite resource. The first goal of the public outreach campaign is to connect the community to their water supply so they view it as a valuable resource that should not be wasted.

Once the public understands the importance of water conservation they will be more willing to actively reduce their water use. The second goal of the public outreach program is to give the community ways to do so. This includes providing tips to reduce seasonal peak demand (outdoor measures) and base demand (indoor measures) and information about available water conservation programs. The outreach program can also provide information about what the City is doing to decrease its water use and improve system efficiency (i.e. replacing inefficient plumbing fixtures, changing irrigation schedule, etc.).

The City can use various media to "get the word out" as part of their public outreach ad campaign thus allowing the City's message to reach a wider audience. These methods include:

- Create a water conservation web page to be published on the City's web site. In addition to providing conservation information and tips, the site may include links to AWWA's WaterWiser, Regional Water Providers Consortium and other conservation websites.
- Distribute water conservation brochures at community events and/or in water bills. Brochures may also be displayed in visual place in City Hall. Public work crews should have copies available to give to those observed wasting water.
- Publish conservation articles in the City's bimonthly newsletter.
- Post signs in public areas, such as City Hall, post office, restaurants, and hotels. This would be especially important during summer months to encourage tourists to participate in conservation efforts.

- Campaign ads on local radio and television stations in summer to remind residences and visitors of the importance of water conservation.

Many of these public outreach elements were initiated as a result of the last WMCP. Due to the breadth of options and media used the public outreach ad campaign will continue to develop and change as the City's conservation needs and capabilities evolve.

School Programs

Contacts through schools can help educate young people about the value of our water resources and conservation techniques aimed at protecting those resources. The City will work with schools to develop curriculum that teaches students about water conservation and encourages the use of water conservation practices through a variety of school programs. Some of these programs may include tours of the City's water treatment plant or guest speakers. Details on this element of the public education program are still in the planning stage, but an update on the program's development will be assessed in the WMCP progress report in 2025.

3.8 ADDITIONAL CONSERVATION MEASURES

It should be noted that the conservation measures described below will represent a significant investment of City staff, time, and money. For this reason, these measures should be staged to ensure that each measure is effectively implemented without imposing a serious strain of City resources. An evaluation of the proposed measures will be included in the 2026 update to this WMCP.

Water Line Repair & Replacement

There are approximately 183,000 linear feet of pipeline in the City's water transmission and distribution system. Approximately 30% of these lines date back to the 1950's and are constructed of asbestos cement (AC). Many of these AC lines are assumed to be at or near the end of their useful life and may be significant source of the City's water loss.

The State requires water systems experiencing water loss in excess of 15% to implement a line repair and replacement program (OAR 690-086-0150 (6)(a)). The exact percentage of water loss occurring in the Rockaway Beach system will be determined through detailed water audits as described in Section 3.5. Unaccounted water in Rockaway Beach, however, averages near 49.8% in the latest master plan. Therefore, it is assumed that the City is subject to this requirement. However, the City will continue to monitor unaccounted for water as data to determine when it drops below 15%

The City has already established a line repair budget. The City will continue to allocate money into this budget and, if possible, increase funding to include saving for line replacement. Line repair and replacement priorities will target the most problematic sections of the system as determined by the results of the systematic leak detection program (see Section 0).

Additionally, the City's goal is to replace 50% of all the existing AC pipelines during the upcoming 20-year planning period. This will require replacing approximately 1,250 linear feet per year.

Technical Assistance Programs

In addition to reducing water waste by repairing or replacing leaking pipelines, customer water waste will also need to be addressed. As part of the State requirements, the City will develop programs to help customers identify and eliminate water waste. An effective water conservation program goes

beyond the initial outreach previously discussed to actively aid the public in reducing water consumption.

The City will begin offering leak detection assistance (outdoor only) for customers upon request. These site visits will allow staff to talk with customers about conservation, answer questions, and sell indoor and/or outdoor retrofit kits if appropriate. The City may also provide information on how to check for indoor leaks and offer leak detection tablets for toilets.

The City is too small to provide financial assistance to customers in repairing leaks.

Inefficient Fixture Retrofitting and/or Replacement Program

Over the past two decades, technology has improved the efficiency of plumbing fixtures and water using equipment. The USEPA estimates toilets represent 30% of indoor water consumption. Showers and faucets represent 17% and 11%, respectively of indoor water use. Replacing older fixtures will help reduce water waste and conserve energy. Use of inefficient water fixtures (e.g. faucets, toilets, shower heads) result in much higher water consumption than is necessary. As part of the State requirements, the City will develop programs to address this problem.

Many fixtures can be retrofitted relatively inexpensively. In fact, many municipal water suppliers distribute free indoor and/or outdoor retrofit kits to all customers. Another method of distribution is to provide fixtures for purchase at City Hall. Indoor retrofit kits usually consist of toilet tank inserts, low-flow showerheads, and faucet flow-restricting devices. Outdoor retrofit kits typically include an adjustable hose nozzle, hose repair kit, rain gauge, and timer. Both kits also provide informational guides to reduce water use. The cost of these indoor retrofit kits varies from \$2.50 to \$8.00 each, depending upon the number and specific items in each kit. In general, outdoor kits cost approximately twice as much as indoor kits. The City may also stock kits for supplying to new residences as part of the basic hook-up fee.

The City has begun replacing some of the older toilets and faucets in their facilities with new efficient models. As part of their conservation plans, this program will continue until all fixtures in public facilities meet existing water consumption standards (Table 3-7).

Table 3-7: Toilet and Facet Water Consumption Standards

Model	Toilets Water Consumption (GPF)	Faucet Water Consumption (GPM)
High-Efficiency	1.3	1.5
Current Standard	1.6	2.2
Pre 1995	3.5 – 7.0	3.0 – 7.0

Additionally, the City will also investigate the feasibility of offering rebates and other incentives for customers to invest in water-efficient products. A program to accelerate replacements, coupled with high-efficiency standards on new buildings, can yield substantial water savings. An update on the incentive or rebate program will be provided in the WMCP progress report of 2025.

Rate Structure

Under OAR 690-086-0150(6)(d) requires the City to adopt a rate structure that supports and encourages water conservation. The City’s existing rate structure, as discussed in Section 3.3, meets the State’s requirement. The City’s water rate structure is composed of a base water rate plus a uniform consumption charge. This type of rate structure not only encourages responsible water consumption,

but also provides the City an economic tool to encourage water conservation by raising the consumption-based charge during periods of water shortage.

The City periodically reviews its water rates. As previously noted, the City bills on a bi-monthly basis. This practice is not anticipated to change during this planning period. The City's existing software is not capable of including historic water consumption with each billing. However, when the City upgrades its software, this capability be included as a selection criteria.

Water Reuse and Recycling

There are limited opportunities for water reuse and recycling within the City's system. Using water from the City's wastewater treatment plant is infeasible due to the extremely high cost of treatment, operations, and distribution infrastructure. Furthermore, the City of Rockaway Beach does not support large amounts of irrigation or industrial activities that are permitted to use reclaimed water. The major opportunity for water recycling is at the City's water treatment plant. Currently, water used for backwashing is discharged into Jetty Creek, downstream of the City's intake. The City is working with the State to determine if the backwash water used for its new treatment plant could be discharged at the upstream portion of the Jetty Creek impoundment.

Although it is not practical to implement a wide-spread water reuse program, the City will encourage limited use of domestic graywater. Under Oregon law, graywater means shower and bath, bathroom sink, kitchen sink, and laundry wastewater. Graywater does not mean toilet or garbage wastes, or wastewater contaminated by soiled diapers. If appropriately collected and handled, graywater can be safely reused for flushing toilets and urinals as well as irrigating certain trees and plants. Reuse of graywater reduces the demand on other sources of water, such as potable water, surface water, and groundwater. Any use of graywater within the City must meet all State requirements.

Other Conservation Measures

Over time these conservation measures described in this WMCP will help reduce daily and peak demand. However, the City currently experiences difficulty meeting existing summer peak demands and may need to take actions that will provide immediate relief to the water production system. These difficulties typically occur on weekend when summer tourists further burden the City's water supply. During these periods the demand is greater than the system's production capacity, which puts the system on the verge of a short-term water emergency.

Much of the water use during these peak periods is used for outdoor nonessential activities. These activities include watering lawns and gardens, filling pools and ponds, washing sidewalks, and washing vehicles. The City may need to restrict such activities on summer weekends to avoid a minor water emergency. Simple policies such as banning vehicle washing and irrigation on weekends can have a significant impact on decreasing peak demands without adversely impacting customers. The success and acceptance of such a policy, would rely heavily on the effectiveness of the public education that informed the community, including tourists, and the need for policy and its requirements.

The City will also consider adopting a water conservation ordinance that maximizes beneficial water use and makes wasteful water practices unlawful.

Examples of wasteful water use include:

1. Washing of cars, boats, or other vehicle except in recirculating car washes;
2. Washing of sidewalks, driveways, streets, or other hardscapes;

3. Excessive water of landscaping that produces runoff or watering between the hours of 8 a.m. and 6 p.m.;
4. Non-recirculating decorative fountains;
5. Failing to repair a controllable leak; and
6. Using hoses without stop nozzles.

The City will also consider setting up a “Water Waste Hotline” where people can report wasteful water use. The City can then visit violators to distribute information and retrofit kits.

3.9 SUMMARY OF 5-YEAR BENCHMARKS

As previously noted, this WMCP outlines the City’s conservation program. The success of a conservation program requires careful planning, including coordinating implementation of each element so that adequate staff and funding are available to ensure its success. Due to the City’s expansive program goals and limited resources, benchmarks have been developed for the implementation of each element of the program. Summary of the City’s five-year benchmarks is listed in Table 3-8.

Table 3-8: Summary of the 5-Year Benchmarks for Conservation Program

Benchmark	Start Date	Frequency
Water use measurement reporting	NA	Annual
Water audit	On-going	Annual
Customer meter replacement program	On-going	On-going
Source meters calibration	On-going	Annually
Develop conservation web page	2019	On-going
Distribute water conservation brochures	2019	On-going
Publish conservation articles in the City's newsletter	On-going	2-4 times per year
Post conservation signage	2020	On-going
Radio and TV ads	2020	On-going
Leak detection program	On-going	On-going
Develop school conservation programs	2021	Annual
Line repair & replacement program	On-going	On-going
Technical assistance program	2021	On-going
Incentive/rebate feasibility determination	On-going	NA
Water Waste Ordinance consideration	On-going	NA
Reduce Unaccounted Water by 2% by next WMCP	2019	On-going



Section 4

Water Curtailment Element



Element 3: Water Curtailment Element

Water curtailment plans are designed to help water suppliers in the event of a short-term water emergency. These plans aim to minimize the impacts of a short-term water shortage by reducing water demand using a combination of voluntary and mandatory water conservation and restriction measures. These measures become progressively more severe as the water emergency level increases.

Water curtailment should not be confused with water conservation. Curtailment is a response to a short term water supply emergency and these measures are enacted only as long as the emergency exists. In contrast, water conservation focuses on measures that reduce the City's long-term water loss, wastes, and consumption.

The City currently does not have an ordinance for declaring water emergencies. Although the State does not require such legislation, this may limit the City's ability to effectively enact water saving measures necessary during water shortages. The City may consider adopting such a resolution. In the absence of a City ordinance, water emergencies will be declared by mayoral authority based on the recommendation of the Public Works Department.

The Oregon Water Resource Department requires a water curtailment element as part of the WMCP per OAR 690-086-0160. The curtailment element includes an assessment of the likelihood that the City may experience a short-term water emergency based on past history. Curtailment plans must have a minimum of three stages of alert and define specific triggers and curtailment measures associated with each stage. By clearly identifying how each stage is defined and managed, the City will have the appropriate response to a water shortage event. Requirements for this section are listed in Table 4-1.

Table 4-1: Water Curtailment Element Requirements

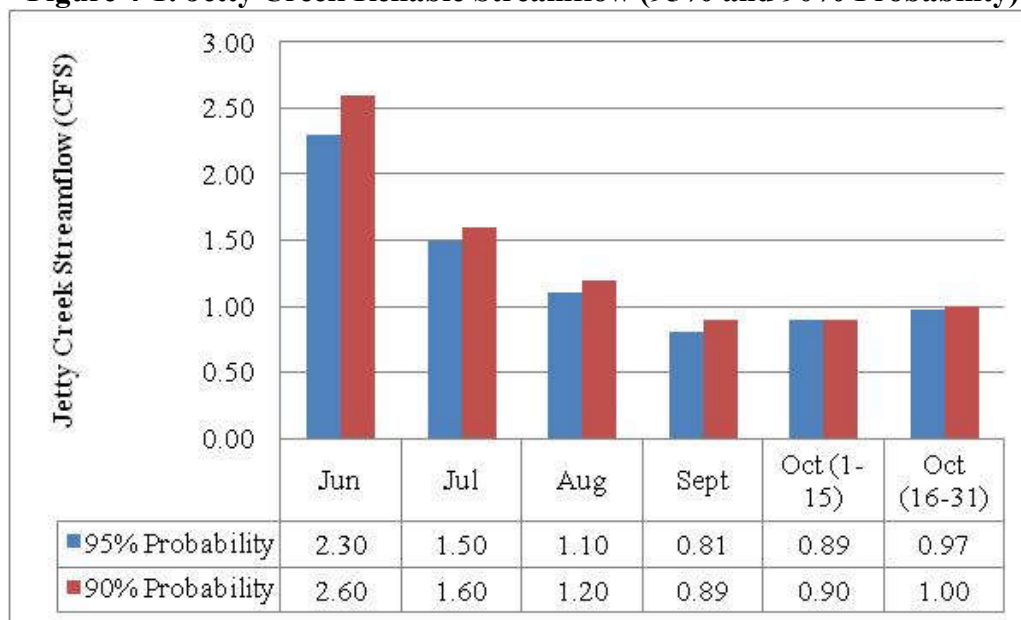
Requirement	OAR Reference	Section
Water supply assessment and description of past deficiencies	690-086-0160 (1)	4.1
Stages of alert	690-086-0160 (2)	4.3
Triggers for each stage of alert	690-086-0160 (3)	4.2
Curtailment actions	690-086-0160 (4)	4.3

4.1 HISTORICAL DEFICIENCIES

In the last ten years, Rockaway Beach has not experienced any natural or mechanical disasters that have caused a severe water shortage. However, during summer months (especially 4th of July and Labor Day weekends), tourism in the area increases peak water demand near the system's production capacity while at the same time, flows in Jetty Creek are at their lowest. As a result of these deficiencies, the City must undertake special operating procedures, extended hours, and develop new infrastructure to overcome the problems. These actions have maintained the City's ability to meet high water demands even when supply is low. The City, however, recognizes that these measures may not be sufficient to offset severe and/or prolonged periods of water deficiency.

A statistical analysis of Jetty Creek streamflows was performed to identify the probability of reliable summer streamflows based on daily streamflow data from 1976 to 1995. Unfortunately, in 1995 the station was removed and not replaced, so there is no available data since then. Since this is the best data available, it was used for the analysis. The actual stream data even if old is far better than other methods of estimation, so it is what the City feels most comfortable using. Several methods were used to determine the 95% and 90% reliable streamflow including a normal distribution and relative probability. Results from the relative probability analysis were assumed to best represent actual observed streamflow distribution and thus used. The following figure shows the reliable streamflow in Jetty Creek between the months of June through October. These are the months where low stream flows are of concern. Reliable streamflow is defined as the minimum daily flow that is expected for a given period. For example, 95% of the flows in July are equal to or greater than 1.50 cfs.

Figure 4-1: Jetty Creek Reliable Streamflow (95% and 90% Probability)



The results of the statistical analysis indicate that the City is frequently incapable of withdrawing its full 2.0 cfs water right. The City's maximum day water demand is 0.675 mgd (see Section 2.3), which is equivalent to 1.05 cfs, which does not take into account the instream water right on Jetty Creek. This analysis shows the need to supplement the Jetty Creek source with water from the City's wells.

The City is actively increasing its ability to meet high water demands regardless of Jetty Creek flow conditions. A new membrane water treatment plant was installed in 2011, and has an estimated production capacity of 1.15 MGD. Also, by using a membrane filtration system, the City will have better capability to handle high organic loading from the source wells. In addition to the new treatment plant, the City is also improved its raw water impoundment on Jetty Creek, including expanding existing holding capacity, and diverting it out of the main channel.

The treatment and source improvements will provide the City with a secure source of treated drinking water to meet its customer's demands. Furthermore, the City has equipped major components of this production transmission, and distribution system with backup power generators in order to maintain water delivery to its customers during short-term power outages. However, the City recognizes the potential for natural disasters or severe operational malfunction to require the implementation of a water curtailment program.

4.2 CURTAILMENT PROGRAM & OBJECTIVES

The goals of the City’s water emergency response plan are to:

- Minimize the impacts of a short-term emergency water shortage;
- Rapidly restore water service after an emergency;
- Ensure adequate water supply for fire demand;
- Minimize impact and loss to customers;
- Minimize negative impacts on public health and employee safety; and
- Provide emergency public information concerning customer service.

The role of this curtailment plan in meeting these goals is to reduce demand by imposing voluntary and mandatory water curtailment actions. These actions become progressively more severe as the water emergency stage increases.

A water curtailment plan was developed in 2005 in conjunction with the City of Rockaway Beach’s Emergency Response Plan and serves as the basis for this plan. This curtailment plan includes four stages beginning with a mild warning status and concluding with a critical water emergency status (Table 4-2). Curtailment actions associated with these levels-of-alert range from merely informing public of potential deficiency problem to water rationing during an extreme water emergency. See Section 4.3 for a detailed description of each stage.

Table 4-2: Summary of Water Emergency Stages

Stage	Level	Description
1	Mild	Primarily a tool to inform the public that a potential problem exists. The problem may not yet warrant mandatory water curtailment, but does suggest voluntary conservation.
2	Moderate	First level of action for the City to enact mandatory water restrictions. This level would include all planned activities requiring temporary conservation including construction and maintenance activities as well as preparing for expected drought conditions.
3	Severe	A wider range of activities are affected. This is the most restrictive level of mandatory water conservation activities carrying the highest penalties to enforce the curtailment status.
4	Critical	Reserved for extreme water supply problems, typically in response to a major natural disaster. The goal of this stage is to provide minimum amount of water to the consumers to sustain life and would probably include rationing of drinking water.

Alert Stage Triggers

Each level-of-alert is triggered by specific emergency conditions. These triggers are defined control points that eliminate speculation on when to impose restrictions during an emergency. As recommended by the Oregon Water Resource Department, triggers for supply, demand, and capacity have been developed for each level-of-alert. The curtailment plan also allows for a system manager assessment to increase water emergency status.

Supply

Triggers for demand include information about Jetty Creek stream flows, as well as using national indices to predict the potential of draught conditions to develop and/or continue.

a) Stream flows

As noted in Section 2.4, Source of Supply, Jetty Creek frequently experiences low flows that do not allow the City to withdrawal their full water right of 2 cfs. Jetty Creek has the highest water quality of all of the City's sources and represents 88% of the annual water production. Due to the water quality issues of some of the wells, as the streamflow drops in Jetty Creek, the City is forced to rely more on their stored water. Continued low flows could result in draining storage faster than can be restored and lead to water shortage.

b) Palmer Index

The Palmer index (PI) is a widely used scale for measuring drought conditions. The PI is based on long-term records of temperature and precipitation and is tabulated by the US National Weather Service on a weekly basis. PI calculations are made for 350 climate divisions in the United States and posted on the NOAA and National Weather Service websites.

Normal weather has an index of zero in all seasons in any climactic region; droughts have negative index values while wet periods have positive values. Consecutive negative values from week to week can provide initial warning of an impending drought. Long-term negative values can assist the City in determining the severity of the drought conditions. The PI is updated weekly and is easily accessible at the following website:

http://www.cpc.ncep.noaa.gov/products/analysis_monitoring/regional_monitoring/palmer.gif

c) Surface Water Supply Index

The Surface Water Supply Index (SWSI) is similar to the Palmer Index in that it is an index that describes the current state of water resources in a given area. Calculated monthly by the National Resources Conservation Service (NRCS) for the major river basins within the state of Oregon, the SWSI can be used to identify which river basins are above, below, or at the normal surface water supplies. Historical data of the SWSI in the Willamette basin for 2014 through 2016 suggests the sensitivity the area has to annual rainfall on the area's surface water availability. The SWSI for Oregon is updated monthly and can be viewed and downloaded at the following website:

<https://www.nrcs.usda.gov/wps/portal/nrcs/detail/or/snow/waterproducts/?cid=stelprdb1244919>

Demand

The demand on the water system is most easily judged by the water level at the McMillan Creek Reservoir. As noted in Section 2, water from the treatment plant clear well is pumped directly to this reservoir, which then fills the remaining two reservoirs. In addition to being important as a source of storage, the water level in McMillan Creek Reservoir provides water pressure in a large portion of the water service area.

Capacity

The system capacity can be defined as the total water available from the system from production and storage facilities. Either of these components may be affected differently in a water shortage. Production will be limited to the plant capacity of 1.15 mgd and from the availability of water sources. Demand in excess of the production capacity will begin to deplete storage volumes. If the system capacity continues to be stressed, the City will be unable to re-gain storage in reservoirs.

System Manager Assessment

Few will know more about the viability and conditions of water supply than the operators and managers of the water system, and they need the ability to invoke Alert Stages if they consider it necessary. This “trigger” is important for such items as maintenance or construction on a critical system component, knowledge of raw water deficiencies other than volume, or other situations requiring specific curtailment actions.

4.3 DESCRIPTION OF EACH STAGE

Alert Stage No. 1: Mild Water Emergency

This level-of-alert would be declared if a water shortage or equipment failure poses a potential threat to the ability of the water system to meet the demands of its customers. Indicators will include:

- Jetty Creek flows drop to less than 1.5 cfs
- PI value between -2.0 to -3.0
- SWSI value between -1.5 to -2.5
- Demand reaches 60% of capacity

The intent of this level is to inform the public and ask for voluntary reduction in water use practices. All water conservation at this level is on a voluntary basis. The City should be prepared to provide information and support for this voluntary effort. If the public is aware of the potential for problems, they will be more likely to accept and abide by more serious requirements should the alert status be increased. Measures associated with this level-of-alert include:

1. Institute a voluntary restricted watering schedule based on odd/even address numbers for residential and business customers. The voluntary schedule shall apply to all residential and commercial lawn watering and other nonessential water uses with exceptions as specified by the City. Customers will be asked to restrict watering to the night hours to avoid loss through evaporation. Customers will also be asked to avoid all outdoor water use during typical times of peak demand (i.e. weekends, mornings, evenings).
2. Disseminate information brochures on conservation methods. Advertising on radio, televisions, newspaper, sandwich boards, signs on City Kiosks and other media will also be utilized to keep the public updated on the water supply situation. The City will also provide recorded information on the City Hall and Public Works phones.
3. Request that consumers make efforts to voluntarily reduce water consumption up to 10 percent of normal through personal conservation efforts. This may include the repair of household leaks,

installation of low flow fixtures, reduction or elimination of landscape watering, and other conservation efforts.

4. Provide specific notification to major water users asking for voluntary reductions in use and/or deferring nonessential use to off-peak hours.
5. City operated decorative fountains that do not recirculate water shall cease operating.
6. City uses of water for hydrant and water line flushing shall be limited to essential needs.
7. No use of City-supplied water to wash sidewalks, walkways, streets, driveways, parking lots, or other hard surface areas except where necessary for public health or safety.
8. Usage of City-supplied water to wash vehicles shall only be permitted during weekdays.
9. The City should develop a water system reporting sign to indicate the general condition of the City's water supply. Often used to warn of variety levels of fire danger, a properly located reporting sign can send a regular reminder to consumers that the water supply is tenuous. Under Stage One curtailment, the reporting sign should raise the alert that the water is low and remind consumers to use water wisely.

Alert Stage No. 2: Moderate Water Emergency

This level-of-alert would be declared if a water shortage or equipment failure poses a serious threat to the ability of the water system to meet the demands of its customers. Indicators may include:

- Streamflow is Jetty Creek flow below 1.0 cfs
- PI value between -3.0 to -4.0
- SWSI value between -2.5 to -3.25
- Demand reaches 90% of capacity
- A component within the water system breaks down or is taken off-line for an extended period of time. This would include major repairs or renovations within the water treatment plant, major renovation of a reservoir, or another major improvement project.
- If streamflows continue to fall to levels that make water production difficult, operations staff may wish to increase the alert stage. In Rockaway Beach, this trigger must be primarily based on operator experience.

This level-of-alert includes mandatory water conservation requirements. The City would increase efforts to educate the public about the seriousness of the water supply shortage. Curtailment actions would include mandatory restrictions and no longer rely on voluntary water conservation. Measures associated with this level of curtailment include:

1. Stage One curtailment measures 2-7 continued.
2. Watering or irrigating of lawns, landscaping, and gardens may only occur on weekdays between 6pm and 6am.
3. No use of City-supplied water shall be allowed to clean, fill, or maintain levels in decorative fountains.

4. No use of City-supplied water shall be allowed to wash vehicles.
5. Hydrant and water main flushing shall be done for emergencies only.
6. Restaurants will be required to post drought notices and offer drinking water only upon request. Other high volume water consumers (hotels, recreation centers, etc.) may be required to post drought notices apprising their clientele of the drought conditions.
7. The City reporting sign should indicate the upgrade of severity and further caution consumers about the wise and prudent water use.

Alert Stage No. 3: Severe Water Emergency

This level-of-alert could be declared if a water shortage or equipment failure poses a severe and immediate threat to the ability of the water system to meet the demands of its customers. Triggers may include:

- Jetty Creek flows drop to within 0.75 cfs
- Demand reaches 95% of capacity

Scenarios that would result in a declaration of a water emergency would be of an unplanned nature. This may include A few specific scenarios are listed below:

- Landslide that destroys intakes and/or raw water supply piping;
- Collapse or failure of a storage reservoir;
- Severe source contamination by pesticide, chemical spill, sabotage, etc.;
- Landslide that destroys treated water line from water plant to the distribution system or the raw water intake system;
- Extreme drought conditions resulting in the near inability to obtain raw water for basic service.
- Natural disaster such as earthquakes or landslides, acts of terrorism or sabotage, complete failure of water system components, and other emergency conditions.

While many of the scenarios listed above are not likely to occur, it is not unreasonable for the City to develop plans and strategies to prepare for emergency conditions within its water system.

This stage includes additional mandatory conservation requirements brought on by severe or emergency conditions.

Curtailment actions and restriction described in Stages One and Two along with provisions to prohibit all nonessential outdoor use would be continued under this stage of emergency. Severe penalties should be enforced for those not abiding by these strict water curtailment actions. Curtailment actions associated with this level would include:

1. Stage One curtailment measures 2-7 and Stage Two measures 3-6 continued.
2. No watering or irrigating of lawns, landscaping, gardens and any other outside water use.
3. All outdoor use prohibited.
4. No use of city-supplied water shall be allowed to fill swimming pools or other pools.

5. The City reporting sign should indicate the upgrade of severity and further caution consumers about the wise and prudent water use.

Alert Stage No. 4: Critical Water Emergency

This final level-of-alert is necessary if disaster conditions make it impossible for the water system to continue functioning under normal parameters. Indicators of this level include the inability of the water plant to produce additional water or the distribution system to deliver potable water to the consumers. This status is only for the most extreme cases where resources must be managed carefully and water rationed to consumers for the purpose of sustaining life.

This level-of-alert applies only to an extreme water curtailment condition. The goal of this level of curtailment should be to provide enough water to sustain human life. Conservation actions within this stage may include closing the distribution system or disconnecting all water users from the system. The City may choose to ration all water use from a central location, reservoir, or directly from the water treatment plant.

Table 4-3: Curtailment Plan Matrix

Alert Stage Level	Triggers	Goal	Curtailment Actions
Level 1 - Water Alert	<ul style="list-style-type: none"> • Jetty Creek Flows: < 1.5 cfs • PI: -2.0 to -3.0 • SWSI: -1.5 to -2.5 • Scenic View reservoir: > 30 for 24-hr period • Demand: > 60% of system capacity • Recommendation of water plant operators 	Public Awareness and 5% reduction in consumption	<ol style="list-style-type: none"> 1. Institute a voluntary restricted watering schedule based on odd/even address numbers for all customers. 2. Disseminate information brochures on conservation. 3. City operated decorative fountains that do not recirculate water shall cease operating. 4. Hydrant and water line flushing only for essential needs. 5. No washing of sidewalks etc. except for public health. 6. Reporting sign should alert that the water supply is low.
Level 2- Moderate	<ul style="list-style-type: none"> • Jetty Creek Flows: < 1.0 cfs • PI: -3.0 to -4.0 • SWSI: -2.5 to -3.25 • Scenic View reservoir: > 27 for 24-hr period • Demand: > 85% of system capacity • Recommendation of water plant operators 	10% reduction in consumption	<ol style="list-style-type: none"> 1. Continue Level 1 curtailment measures 2. Mandate restrictions on all lawn watering and other nonessential uses of water 3. Hydrant and water main flushing shall be done for emergencies only. 4. Businesses will be required to post drought notices 5. Reporting sign should indicate the upgrade of severity.
Level 3 - Severe	<ul style="list-style-type: none"> • Jetty Creek Flows: < 0.75 cfs • PI: -4.0 or less • SWSI: -3.25 to -4.0 • Scenic View reservoir: > 25 for 24-hr period • Demand: > 90% of system capacity • Recommendation of water plant operators 	15% reduction in consumption	<ol style="list-style-type: none"> 1. Continue all Level 1 and 2 actions 2. Prohibit all nonessential outside water use. 3. The City reporting sign should indicate the upgrade of severity and further caution consumers about the wise and prudent water use.
Level 4 - Critical	Inability of the water plant to produce or the distribution system to deliver potable water to the consumers.	Sustain Human Life	<ol style="list-style-type: none"> 1. Continue all Level 1, 2 and 3 actions 2. Impose water rationing

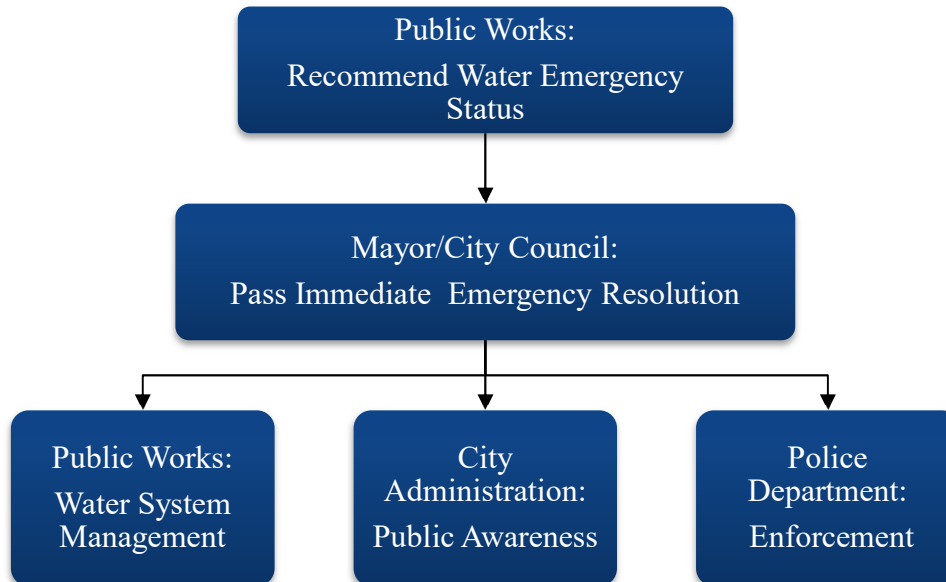
4.4 PLAN IMPLEMENTATION

Implementation program to enact this curtailment plan will adhere to the following steps:

1. Recommend Water Emergency Status - Water treatment plant operators and Public Works Director are best suited to determine if the status of the water supply, demand, or production may lead to a water shortage.
2. Pass Emergency Resolution - Based on Public Works' recommendation, the Mayor and/or City Council will pass a resolution declaring a water emergency and the curtailment plan would become effective immediately.
3. Plan Enactment – The various departments with the City will work in cooperation to ensure the curtailment plan is abided by. The Public Works Department, headed by Public Works Director Luke Shepard, will direct all operation and will ensure the management of City facilities and water supply meet the plans requirements. City administration will be responsible for public awareness, including distributing informative brochures, posting signs and spearheading media campaign. Enforcement of curtailment measures will be done by the Police Department, who will also help with increasing public awareness.

A schematic of the current chain of command to enact the curtailment plan is provided below:

Figure 4-2: Water Curtailment Plan Enactment Schematic



4.5 Review & Updating

The City will continue to review this curtailment plan and update it as necessary. As part of this process, the City may consider adopting a *Water Curtailment Ordinance*. Sample ordinances are found in the appendix of this document. Any changes to this plan will be detailed in the WMCP progress reports and updates.

City of Rockaway Beach
Water Management & Conservation Plan



Section 5
Water Supply Element



Element 4: Water Supply Element

The purpose of the *Water Supply Element* is to provide a long-range supply plan in which the City of Rockaway Beach prepares a water demand forecast and compares the projected demand to available supplies. This section also shows how management of the resource through activities identified in the water conservation element can contribute to meeting customers' needs. The required elements for this section of the Water Management and Conservation Plan are outlined under OAR 690-086-0170. A summarized list of these items and the location where they are addressed in this document is shown in Table 5-1.

Table 5-1: Water Supply Element Requirements

Requirement	OAR Reference	Section
Future service area and population projections	690-086-0170 (1)	5.1
Schedule to fully exercise each permit (i.e. certification)	690-086-0170 (2)	Table 5-4
Demand forecast	690-086-0170 (3)	5.2
Comparison of projected need and available sources	690-086-0170 (4)	5.3
Analysis of alternative sources	690-086-0170 (5), (8)	5.3
Maximum rate and monthly volume quantification	690-086-0170 (6)	Table 2-6
Mitigation actions under state and federal laws.	690-086-0170 (7)	5.5
Greenlight Water Request - Conservation measure schedule and cost effectiveness	690-086-0170 (8)(a)	3.1
Greenlight Water Request - Justification that selected source is most feasible and appropriate	690-086-0170 (8)(b)	5.3
Greenlight Water Request - Mitigation requirements	690-086-0170 (8)(c)	3.8

5.1 FUTURE SERVICE AREA

There is no anticipated extension of Rockaway Beach's Urban Growth Boundary (UGB) within the planning period of this WMCP. The general customer characteristics of the community are also expected to remain constant.

Population Projections

The population for the City of Rockaway Beach Water System is actually greater than the estimated population of the City of Rockaway Beach. The water system serves the City, the unincorporated area of Nedonna Beach, areas outside of the City but within the UGB, and a development just south east of the UGB. In addition, to the population outside of the City limits, the area has a high transient or part time population. Many of the homes within the City and surrounding area are vacation rental homes or second homes, which causes a significant increase in City population during the summer. Due to this, the true summer population for the water system users is not reflected in the estimated populations by the Census or the Population Research Center. The 2010 Census shows that 38% of the total housing

units are being occupied. From these numbers it can be assumed that approximately 62% of the housing units within the City are owned by a transient population that does not make Rockaway Beach their full time residence.

Based on the 2019 Portland State University preliminary population estimate, the existing water system serves a full-time population of approximately 1,365 within the City limits of Rockaway Beach, there are additional users outside City limits. Comparing the 1990 to 2000 census, the City’s population growth has averaged 2.71% per year however, the master plan shows an average annual increase of only 0.34% per year between 2010-and 2012. The City of Rockaway Beach water system has 2,558 active meter accounts (as of December 2019).

As previously noted, the rate at which growth is occurring in Rockaway Beach has declined over the past decade. It is expected that as the economy recovers, the rate of the water system's population growth will begin to increase. Recent estimates of full-time populations indicate growth of 0.8%. For the purpose of this WMCP, future growth in the system population will be estimated at a conservative rate of 1.0% based on the most recent WMP projections. The table below shows the projected populations for the full-time City residents only.

Table 5-2: Current and Projected Population

Year	City Population (Full-Time Population)
2019	1,847
2024	1,941
2029	2,040
2034	2,144
2039	2,254

Land Use and Anticipated Development

There is sufficient buildable land in the UGB to accommodate this growth.

5.2 PROJECTED DEMAND

The recent water master plan updated population and demand projections. It used a 1% annual growth rate, an 167gal/person for ADD and 1.27 ADD:MDD peaking factor. Table 5-3 summarized the projected water demands through the 20-year planning period based on the numbers provided from the master plan.

Table 5-3: Projected ADD and MDD for the 20-Year Planning Period

Year	Population	Average Daily Demand (gpd)	Maximum Daily Demand (gpd)
2019	1,847	308,000	675,000
2024	1,941	324,000	710,000
2034	2,144	358,000	784,000
2039	2,254	376,000	824,000

5.3 Existing Source Capacity & New Source Development

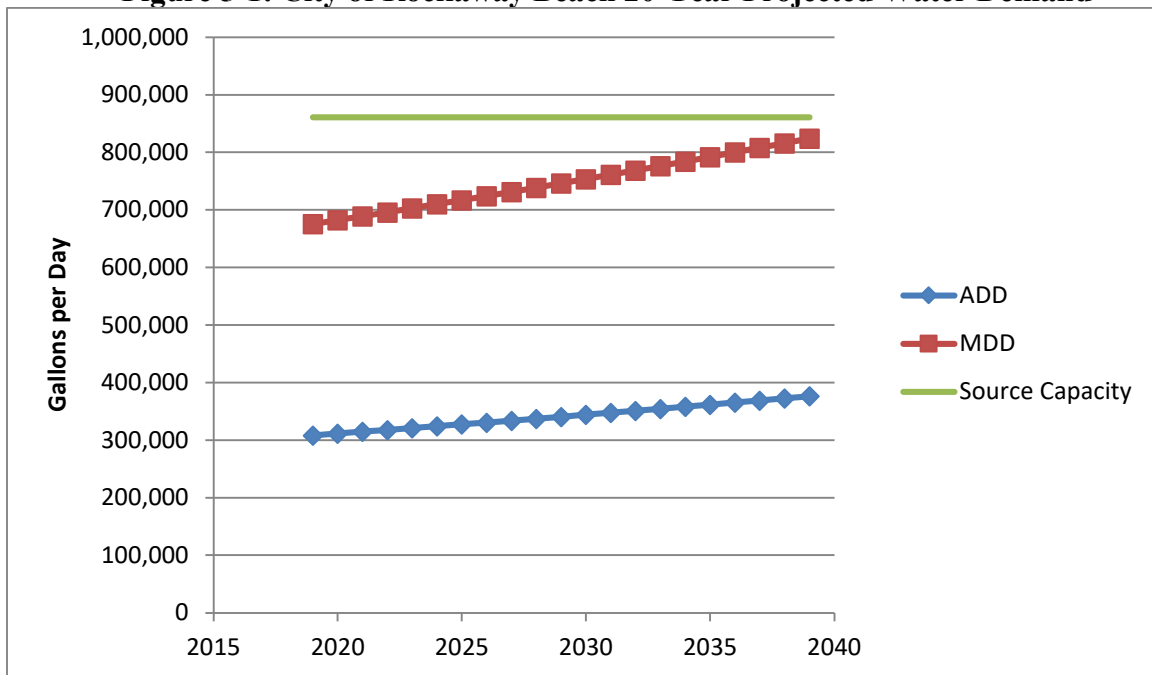
All of the City’s existing water sources have some limitation to production. The majority of the City’s water is produced from Jetty Creek. This source also has the best water quality of any of the City’s sources. However, as discussed in Section 2, low summer flows prevent full withdrawal of the City’s water right. This is especially important since the highest water demands also occur in summer.

To meet the increased demand, Rockaway Beach must pump additional water from its well sources. These wells have had a history of high TOCs and salinity. Water quality in two of the three wells is so poor that the City should avoid pumping from these wells as much as possible. This leaves only the West Well (Well No. 1) as a second existing water source.

Jetty Creek’s average low stream flow of 1.96 cfs occurs in August. However, there is an existing in-stream water right of 0.5 cfs for fish and aquatic life protection. Therefore, the City has an estimated 1.46 cfs or 655 gpm available for water diversions. However, only 448 gpm are available due to equipment limitations. The West Well can provide an additional 150 gpm. The maximum quantity of treated water available to the system is 861,120 gpd.

The average minimum source capacity (of Jetty Creek + 150 gpm from the wells) was evaluated to determine if additional sources are required for the City. As Figure 5-1 shows, if the current water demand per EDU continues, then the projected maximum daily demand of the overall system will not exceed source capacity until after 2039.

Figure 5-1: City of Rockaway Beach 20-Year Projected Water Demand



The analysis of existing source capacity was based on the average minimum summer supply. However, as discussed in Section 2, flows in Jetty Creek frequently drop below 1.96 cfs. In fact, an exceedance probability analysis determined that 25.5% of the daily flows in Jetty Creek are less than 1.96 cfs between April and September. Between July and September, 49.7% of daily flows are below 1.96 cfs. This is also the same time of year that the highest demands on the system occur.

The City of Rockaway Beach needs to seriously examine its available water sources. The first action needed by the City is to secure its existing water rights. The City recently began the process of

requesting additional time for full beneficial use of its uncertified rights (G15325), and will proceed with certification of S46245 in 2020 when it expires. This will ensure that the maximum permitted diversions will not be eliminated or reduced permanently. At this time, only 0.156 cfs of the 0.223 cfs from permit G15325 has been put to beneficial use, but due to well capacity issues, it will be very costly to obtain more water from this source at this time. There are other sources the City would like to prioritize for projects, so it is not requesting green light water from this water right at this time. It is likely that the City may need to explore a partial transfer in the future, because it is not likely that this well will produce more in the future. Water use projections show that MDD will equal available sources in the future, so the next WMCP update will likely include a request for greenlight water, or a plan to develop other already certificated, but currently disconnected sources.

Securing existing water rights may not be sufficient to resolve the City's summer source water deficiencies. If conservation goals are achieved, then the existing sources maybe sufficient. However, Figure 5-1 shows that average available source capacity, and stream flows in Jetty Creek plus 150 gpm from wells frequently decline below this limit. Therefore, the City may need additional source capacity to supplement the current sources, especially during summer.

The following alternatives have been evaluated as potential new sources for the City:

Develop Existing Water Rights

In addition to Jetty Creek and the three wells, the City has municipal rights to water on three other creeks: McMillan Creek, Heitmiller Creek, and Spring Creek. It may be possible to develop one or more of these existing rights to increase the City's water supply.

The City has previously shown interest in developing its water right on Spring Creek (cert. #936). The conceptual idea had been to divert water from Spring Creek to Spring Lake where a new 224-gpm plant would be constructed to treat the water before delivering it into the City's existing distribution system. This would provide the City with an additional 322,000 gallons of municipal water per day, which would be more than sufficient to meet the City's future water demands for some time.

At this time, the City has no plans for moving forward with the Spring Creek water development, although it should be noted that this remains a feasible option for increasing the City's water supply. The Spring Creek water right was acquired by the City via annexation and has been certified for municipal use and therefore cannot be cancelled. Discussions with OWRD have confirmed that the City's plan to develop this right as previously proposed is a legitimate under current Oregon water law. As part of this right's development, the City may wish to transfer the right into its name (currently registered under May Enright) as well as the point of diversion.

Develop Interconnection

A second alternative to increase the City's water supply is an interconnection with another water supplier. The City has investigated the feasibility of purchasing water from the City of Manzanita. The City of Manzanita, in conjunction with the City of Wheeler, has developed a system of wells which have extremely high yields. Well logs have shown that these wells are capable of yielding 1,025 gallons per minutes for a 24-hour duration with a drawdown of only 3.5 inches (Well ID #L01907). These wells are approximately 7 miles northeast of the City and initial cost estimates show that the feasibility of transporting water this distance may be cost prohibitive.

Recently, the City of Garibaldi has also been identified as a possible water supplier. The City of Garibaldi also has a highly productive well source that can provide surplus water to the City of Rockaway Beach. Investigations into this alternative have been limited, but indicate that the cost of such a project would likely be several million dollars.

The reliability of water supplied through an interconnection with another supplier would need to be determined. As with Jetty Creek, other suppliers may have restrictions to their diversions due to streamflow limitations or in-stream water rights. It is likely that such limitation would occur during summer, when the need for supplemental water is at its highest. Therefore, it will be extremely important for the City to consider availability prior to expending millions of dollars for an interconnection.

The City of Rockaway Beach plans to continue to investigate the option of an interconnection as a future water source. Additional information obtained from studies will be reported in future progress reports.

Increase Raw Water Storage

The City recently made improvements to its raw water impoundment on Jetty Creek. These improvements included expanding the volume of the existing impoundment. This provides increased raw water storage, which is used to supplement low summer stream flows. This additional storage would not, however, fully resolve the City's water supply issue. Aside from increasing storage capacity, impoundment improvements have additional benefits including:

- Increasing operation flexibility,
- Reducing sedimentation within impoundment,
- Improving raw water quality
- Stream restoration
- Improving fish passage on Jetty Creek

As part of this project, a new diversion structure was constructed upstream of the existing impoundment. This altered the point of diversion (POD) on Jetty Creek, so the City has obtained a transfer of the water rights on Jetty Creek to the new POD.

Although the project increased the City's ability to store water from Jetty Creek, a storage water right is not required for the project. This is because of the location of the raw water storage impoundment in relation to the new POD. The flows from Jetty Creek are diverted prior to entering the impoundment. Since the impoundment is located after the new point of diversion and it is considered by OWRD as part of the City's water system facilities rather than part of the stream system.

Although this project will not resolve all of the City's problem relating to limited water supply (especially during summer), it will significantly alleviate some of the existing difficulties as well as provide the additional benefits mentioned above. For this reason, the City is moving forward with this project as part of its strategy to increase its water supply.

To date, the City of Rockaway Beach has not identified a reliable source to supplement its existing water supply during summer months. Improvements to the raw water impoundment will alleviate some of the pressures on the water supply, however, additional sources will likely be needed to fully secure adequate water to meet the City's future water demands. The City Council and staff are fully aware of

this issue and are currently in the process of developing a series of alternatives to evaluate. An update on this process will be included in the 2021 status report for this Plan.

5.4 Schedule for Beneficial Use

Of the City’s eight water right permits, all but two have been certified. The two uncertified water rights include the junior water right on Jetty Creek (Permit No. S46245) and the Manhattan Well (Permit No. G15325).

Based on existing water demands, the City should be able to prove up on its Manhattan Well. Although the certification date for this right has expired, the OWRD has recommended that the City move forward with the right’s certification process without first applying for a permit extension. This is because the water right extension may take 12 months or longer to complete, and also requires a public comment period which may result in further delays.

In order to fully perfect all of the City’s water rights, specific tasks and requirements need to be met. A list of these tasks, as well as an estimated timeline for completion is provided in the following table. It is important for the City to hire a well-qualified and knowledgeable certified water rights examiner to complete the application, water reports, and map so that delays are not incurred due to errors or omission in paperwork required for OWRD review.

Significant time will be required for OWRD review of water right certification, extension, and transfer requests. This time may be reduced by utilizing the OWRD’s Reimbursement Authority (RA). The RA provides the OWRD with the ability to enter into a voluntary agreement with an applicant for expedited agency action on an application or other request for regulatory action. Under such an agreement, the applicant pays the cost to hire additional staff, contract for services, or provide additional services to the applicant not otherwise available.

Table 5-4 – Estimated Timeline for Perfecting City’s Water Rights

Date	Task/Action
<i>Manhattan Well WR Certification Process</i>	
Aug-19	Begin certification process
Sep-19	Submit final proof survey map and water use report to OWRD
Mar-20	OWRD review
Mar-20	Water right certificate issued
<i>Junior Jetty Creek WR Certification Process</i>	
Fully Perfect WR	
Jan-20	Begin certification process to fully perfect Jetty Creek Junior WR in accordance with water use
May-20	Submit final proof survey map and water use report to WRD
Nov-20	WRD review
Nov-20	WR Certificate Issued

An update on the status of the permit certifications and extension will be provided in the 2025 WMCP progress report. The City plans to submit claims of beneficial use for all unperfected rights prior to the submittal of the updated WMCP in 2030.

5.5 Mitigation Issues

The Division 86 rules require the water supplier to provide a description of mitigating actions being taken to comply with legal requirements, such as the Federal Endangered Species Act, Clean Water Act, and Safe Drinking Water Act.

The Jetty Creek impoundment improvement project was funded in part due to the presence of federally listed Oregon Coast Coho salmon in the area because it is removing fish passage barriers and extending fish passage up a significant distance upstream. The impoundment improvement will incorporate appropriate fish screening and other State and Federal requirements.

The City's 2021 WMCP progress report will provide information on imposed mitigation actions.



Appendix A

Water Rights Permits & Certificates

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

In the Matter of Transfer Application) FINAL ORDER APPROVING
T-11986, Tillamook County) AN ADDITIONAL POINT OF
) DIVERSION

Authority

ORS 540.505 to 540.580 establishes the process in which a water right holder may submit a request to transfer the point of diversion, place of use, or character of use authorized under an existing water right. OAR Chapter 690, Division 380 implements the statutes and provides the Department's procedures and criteria for evaluating transfer applications.

Applicant

CITY OF ROCKAWAY BEACH
C/O CITY MANAGER, LUKE SHEPARD
PO BOX 5
ROCKAWAY, OR 97136

Findings of Fact

1. On February 27, 2015, CITY OF ROCKAWAY BEACH filed an application for an additional point of diversion under Certificates 47952 and 88869. The Department assigned the application number T-11986.
2. Notice of the application for transfer was published on March 3, 2015, pursuant to OAR 690-380-4000. No comments were filed in response to the notice.
3. On April 21, 2015, the Department sent a copy of the draft Preliminary Determination proposing to deny Transfer Application T-11986 to the applicant. The Draft Preliminary Determination cover letter set forth a deadline of May 22, 2015, for the applicant to respond. The applicant requested that the Department proceed with issuance of a Preliminary Determination and provided the necessary information to demonstrate that the applicant is authorized to pursue the transfer.
4. On November 10, 2015, the Department issued a Preliminary Determination proposing to deny Transfer Application T-11986 and sent a copy to the applicant. Additionally, notice of the Preliminary Determination for the transfer application was published on the

This final order is subject to judicial review by the Court of Appeals under ORS 183.482. Any petition for judicial review must be filed within the 60-day time period specified by ORS 183.482(1). Pursuant to ORS 536.075 and OAR 137-003-0675, 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.

Department's weekly notice on November 17, 2015, pursuant to ORS 540.520 and OAR 690-380-4020. No protests were filed in response to the notice.

5. On March 17, 2016, ODFW submitted the agency's recommendation in favor of consent to the injury of the instream water right.
6. On June 7, 2016, notice of receipt of recommendations to the consent to injury was published in the Department's weekly notice, initiation a 30 day comment period; no comments were received.
7. ODFW's recommendation stated that the transfer would result in net benefits to the resources by enabling the applicants to enhance fish passage, fish habitat and instream flow in Jetty Creek.
8. The first right to be transferred is as follows:

Certificate: 47952 in the name of CITY OF ROCKAWAY (perfected under Permit S-34498)
Use: MUNICIPAL
Priority Date: DECEMBER 8, 1969
Rate: 1.0 CUBIC FOOT PER SECOND
Source: JETTY CREEK, tributary to the PACIFIC OCEAN

Authorized Point of Diversion:

Twp	Rng	Mer	Sec	Q-Q	GLot	Measured Distances
2 N	10 W	WM	17	NE SE	3	1700 FEET NORTH AND 300 FEET WEST FROM THE SE CORNER OF SECTION 17

Authorized Place of Use:

Twp	Rng	Mer	Sec	Q-Q
1 N	10 W	WM	5	NW NW
1 N	10 W	WM	5	SW NW
1 N	10 W	WM	5	NE SW
1 N	10 W	WM	5	NW SW
1 N	10 W	WM	5	SW SW
1 N	10 W	WM	5	SE SW
1 N	10 W	WM	6	NE NE
1 N	10 W	WM	6	NW NE
1 N	10 W	WM	6	SW NE
1 N	10 W	WM	6	SE NE
1 N	10 W	WM	6	NE NW
1 N	10 W	WM	6	NW NW
1 N	10 W	WM	6	SW NW
1 N	10 W	WM	6	SE NW
1 N	10 W	WM	6	NE SW
1 N	10 W	WM	6	NW SW
1 N	10 W	WM	6	SW SW
1 N	10 W	WM	6	SE SW
1 N	10 W	WM	6	NE SE
1 N	10 W	WM	6	NW SE
1 N	10 W	WM	6	SW SE

Twp	Rng	Mer	Sec	Q-Q
1 N	10 W	WM	6	SE SE
2 N	10 W	WM	17	NE SE
2 N	10 W	WM	17	SW SE
2 N	10 W	WM	17	SE SE
2 N	10 W	WM	20	NE NE
2 N	10 W	WM	20	NW NE
2 N	10 W	WM	20	SW NE
2 N	10 W	WM	20	NE NW
2 N	10 W	WM	20	SE NW
2 N	10 W	WM	20	NE SW
2 N	10 W	WM	20	SE SW
2 N	10 W	WM	20	NW SE
2 N	10 W	WM	29	NE NW
2 N	10 W	WM	29	NW NW
2 N	10 W	WM	29	SW NW
2 N	10 W	WM	29	SE NW
2 N	10 W	WM	29	NE SW
2 N	10 W	WM	29	NW SW
2 N	10 W	WM	29	SW SW
2 N	10 W	WM	29	SE SW
2 N	10 W	WM	32	NW NW
2 N	10 W	WM	32	SW NW
2 N	10 W	WM	32	SE NW
2 N	10 W	WM	32	NE SW
2 N	10 W	WM	32	NW SW
2 N	10 W	WM	32	SW SW
2 N	10 W	WM	32	SE SW
2 N	10 W	WM	32	NW SE
2 N	10 W	WM	32	SW SE

9. Certificate 47952 describes the authorized the location of the point of diversion as in the previous finding , however the applicant has supplied that better describes the location as follows:

Twp	Rng	Mer	Sec	Q-Q	GLot	Measured Distances
2 N	10 W	WM	17	NE SE	3	1680 FEET NORTH AND 280 FEET WEST FROM THE SE CORNER OF SECTION 17

10. Transfer Application T-11986 proposes an additional point of diversion approximately 200 feet upstream to:

Twp	Rng	Mer	Sec	Q-Q	Measured Distances
2 N	10 W	WM	17	NE SE	1830 FEET NORTH AND 120 FEET WEST FROM THE SE CORNER OF SECTION 17

11. The second right to be transferred is as follows:

Certificate: 88869 in the name of CITY OF ROCKAWAY (perfected under Permit S-46245)
Use: MUNICIPAL USE
Priority Date: JUNE 24, 1981
Rate: 1.0 CUBIC FOOT PER SECOND

Source: JETTY CREEK, tributary to the NEHALEM RIVER

Authorized Point of Diversion:

Twp	Rng	Mer	Sec	Q-Q	GLot	Measured Distances
2 N	10 W	WM	17	NE SE	3	1680 FEET NORTH AND 280 FEET WEST FROM THE SE CORNER OF SECTION 17

Authorized Place of Use:

MUNICIPAL USES				
Twp	Rng	Mer	Sec	Q-Q
1 N	10 W	WM	5	NW NE
1 N	10 W	WM	5	NE NW
1 N	10 W	WM	5	NW NW
1 N	10 W	WM	5	SW NW
1 N	10 W	WM	5	SE NW
1 N	10 W	WM	5	NE SW
1 N	10 W	WM	5	NW SW
1 N	10 W	WM	5	SW SW
1 N	10 W	WM	5	SE SW
1 N	10 W	WM	5	NW SE
1 N	10 W	WM	5	SW SE
1 N	10 W	WM	6	SE NE
1 N	10 W	WM	6	NE SE
1 N	10 W	WM	6	SE SE
2 N	10 W	WM	20	NW NE
2 N	10 W	WM	20	SW NE
2 N	10 W	WM	20	NE NW
2 N	10 W	WM	20	SE NW
2 N	10 W	WM	20	NE SW
2 N	10 W	WM	20	NW SW
2 N	10 W	WM	20	SW SW
2 N	10 W	WM	20	SE SW
2 N	10 W	WM	20	NW SE
2 N	10 W	WM	20	SW SE
2 N	10 W	WM	29	NW NE
2 N	10 W	WM	29	SW NE
2 N	10 W	WM	29	SE NE
2 N	10 W	WM	29	NE NW
2 N	10 W	WM	29	NW NW
2 N	10 W	WM	29	SW NW
2 N	10 W	WM	29	SE NW
2 N	10 W	WM	29	NE SW
2 N	10 W	WM	29	NW SW
2 N	10 W	WM	29	SW SW
2 N	10 W	WM	29	SE SW
2 N	10 W	WM	29	NE SE
2 N	10 W	WM	29	NW SE
2 N	10 W	WM	29	SW SE
2 N	10 W	WM	29	SE SE
2 N	10 W	WM	32	NW NE
2 N	10 W	WM	32	SW NE
2 N	10 W	WM	32	NE NW
2 N	10 W	WM	32	NW NW

MUNICIPAL USES				
Twp	Rng	Mer	Sec	Q-Q
2 N	10 W	WM	32	SW NW
2 N	10 W	WM	32	SE NW
2 N	10 W	WM	32	NE SW
2 N	10 W	WM	32	NW SW
2 N	10 W	WM	32	SW SW
2 N	10 W	WM	32	SE SW
2 N	10 W	WM	32	NW SE
2 N	10 W	WM	32	SW SE

12. Transfer Application T-11986 proposes an additional point of diversion approximately 200 feet upstream to:

Twp	Rng	Mer	Sec	Q-Q	Measured Distances
2 N	10 W	WM	17	NE SE	1830 FEET NORTH AND 120 FEET WEST FROM THE SE CORNER OF SECTION 17

13. The Oregon Department of Fish and Wildlife (ODFW) has determined that a fish screen is necessary at the new point of diversion to prevent fish from entering the diversion and that the diversion is not currently equipped with an appropriate fish screen. This diversion may be eligible for screening cost-share funds.

Transfer Review Criteria [OAR 690-380-4010(2)]

14. Water has been used within the five-year period prior to submittal of the transfer application according to the terms and conditions of the right. There is no information in the record that would demonstrate that the right is subject to forfeiture under ORS 540.610.
15. A pump and pipeline and a municipal delivery system sufficient to use the full amount of water allowed under the existing right was present within the five-year period prior to submittal of Transfer Application T-11986.
16. The proposed change would not result in enlargement of the right.
17. An instream water right, Certificate 59625, exists for the reach of the river in which the authorized point of diversion would be moved upstream, and streamflows within the reach are frequently below the levels allocated under the instream water right. Thus, the instream water right would be injured as a result of the proposed additional point of diversion.
18. On April 27, 2015, the applicant requested that the Department seek a recommendation from Oregon Department of Fish and Wildlife as to whether the Department should consent to injury of the instream water right pursuant to OAR 690-380-4030.

Conclusions of Law

Based on the recommendation of the Oregon Department of Fish and Wildlife the Department consents to injury of the instream water right evidenced by Certificates 47952 and 88869. The proposed changes in point of diversion in application T-11986 are consistent with the requirements of ORS 540.505 to 540.580 and OAR 690-380-5000 and 690-380-5030.

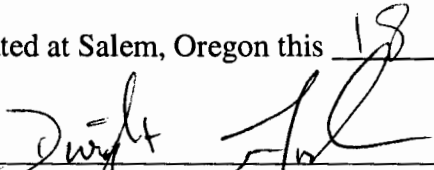
Now, therefore, it is ORDERED:

1. The changes in points of diversion proposed in application T-11986 are approved.
2. The right to the use of the water is restricted to beneficial use at the place of use described, and is subject to all other conditions and limitations contained in Certificates 47952, 88869, and any related decree.
3. Water right certificates 47952 and 88869 are cancelled.
4. The quantity of water diverted at the additional point of diversion, together with that diverted at the original points of diversion, shall not exceed the quantity of water lawfully available at the original points of diversion.
5. Prior to diverting water, the water user shall install an approved fish screen at the new point of diversion and shall provide to the OWRD a written statement from Oregon Department of Fish and Wildlife (ODFW) that the installed screen meets the state's criteria, or that ODFW has determined a screen is not necessary.

The water user shall operate and maintain the fish screen at the new point of diversion consistent with ODFW's operational and maintenance standards. If ODFW determines the screen is not functioning properly, and is unsuccessful in working with the water user to meet ODFW standards, ODFW may request that OWRD regulate the use of water until OWRD receives notification from ODFW that the fish screen is functioning properly.

6. The diversion must be monitored and adjusted accordingly to meet the instream water right (including 5.0 cubic feet per second from October 16, through March 31) as flow and senior rights allow.
7. Construction of the point of diversion must be made within the in-water work period.
8. Full beneficial use of the water shall be made, consistent with the terms of this order, on or before **October 1, 2020**. A Claim of Beneficial Use prepared by a Certified Water Right Examiner shall be submitted by the applicant to the Department within one year after the deadline for completion of the changes and full beneficial use of the water.
9. After satisfactory proof of beneficial use is received, new certificates confirming the rights transferred will be issued.

Dated at Salem, Oregon this 18 day of July 2016.



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

Mailing date: JUL 20 2016

STATE OF OREGON

WATER DIVISION NO. 1 COUNTY OF TILLAMOOK

CERTIFICATE OF WATER RIGHT

(For rights perfected under original, enlargement or secondary permits)

This is to Certify, That F. L. SAPPINGTON

of Tillamook, State of Oregon, has made proof to the satisfaction of the STATE WATER BOARD of Oregon, of a right to the use of the waters of Heitmiller Creek, a tributary of Clear Lake

for the purpose of domestic, including municipal supply under Permit No. 925 of the State Engineer, and that said right to the use of said waters has been perfected in accordance with the laws of Oregon and duly confirmed by order of the STATE WATER BOARD of Oregon, made and entered of record in the Record of Proceedings of said Board, at Salem, in Volume 4, at page 311, on the 2nd day of December, 1918; that the priority of the right hereby confirmed dates from October 18, 1911; that the amount of water to which such right is entitled and hereby confirmed, for the purposes aforesaid, is limited to an amount actually beneficially used for said purposes, and shall not exceed 2.50 cubic feet per second.

A description of the lands under such right, and to which the water hereby confirmed is appurtenant, or, if for other purposes, the place where such water is put to beneficial use, is as follows: Rose City Beach, Twin Rocks Beach, Tillamook Beach and Elmore Park, in Tillamook County, Oregon.

The right to the use of the water aforesaid hereby confirmed is restricted to the lands or place of use herein described.

Rights to the use of water for power purposes are limited to a period of forty years from the date of priority of the right, as herein set forth, subject to a preference right of renewal under the laws existing at the date of the expiration of the right for power purposes, as hereby confirmed and limited.

Witness the seal and signature of the STATE WATER BOARD affixed this 3rd day of February, 1919.

STATE WATER BOARD

(SEAL OF STATE WATER BOARD)

By PERCY A. CUPPER, State Engineer, President

Attest: R. W. POTTER, Secretary

Recorded in State Record of Water Right Certificates, Volume 3, Page 2201.

Vertical text on the left margin: Note Nov-7-1919 Certificate Committed to Landholder Board Water Com. Presented for filing & return

STATE OF OREGON

WATER DIVISION No. 1 COUNTY OF TILLAMOOK

CERTIFICATE OF WATER RIGHT

(For rights perfected under original, enlargement or secondary permits)

This is to Certify, That ROCKAWAY BEACH COMPANY

of Bay City, State of Oregon, has made proof to the satisfaction of the STATE WATER BOARD of Oregon, of a right to the use of the waters of Rockaway Creek, ~~attributed to~~

for the purpose of Domestic use

under Permit No. 51 of the State Engineer, and that said right to the use of said waters has been perfected in accordance with the laws of Oregon and duly confirmed by order of the STATE WATER BOARD of Oregon, made and entered

of record in the Record of Proceedings of said Board, at Salem, in Volume 1,

at page 329, on the 28th day of July, 1919; that the priority of

the right hereby confirmed dates from June 28, 1909; that the amount of water to which such right is entitled and hereby confirmed, for the purposes aforesaid, is limited to an amount actually beneficially used for said purposes, and shall not

exceed 5.00 cubic feet per second.

A description of the lands under such right, and to which the water hereby confirmed is appurtenant, or, if for other purposes, the place where such water is put to beneficial use, is as follows: Rockaway Beach in Tillamook County, Oregon.

~~The right to the use of the water aforesaid hereby confirmed is not to be used for power purposes at the place of use hereinafter described.~~

Rights to the use of water for power purposes are limited to a period of forty years from the date of priority of the right, as herein set forth, subject to a preference right of renewal under the laws existing at the date of the expiration of the right for power purposes, as hereby confirmed and limited.

Witness the seal and signature of the STATE

WATER BOARD affixed this 1st day

of August, 1919.

STATE WATER BOARD

(SEAL OF STATE WATER BOARD)

By PERCY A. CUPPER State Engineer, President

Attest: R. E. POTTER Secretary

STATE OF OREGON
COUNTY OF TILLAMOOK
CERTIFICATE OF WATER RIGHT

This Is to Certify, That CITY OF ROCKAWAY

of Rockaway, State of Oregon, has made proof to the satisfaction of the STATE ENGINEER of Oregon, of a right to the use of the waters of McMillan Creek a tributary of Nehalem Bay (river) for the purpose of municipal (all of the purposes for which water could be used in a city under a right initiated for municipal use) under Permit No. 17176 of the State Engineer, and that said right to the use of said waters has been perfected in accordance with the laws of Oregon; that the priority of the right hereby confirmed dates from July 31, 1946,

that the amount of water to which such right is entitled and hereby confirmed, for the purposes aforesaid, is limited to an amount actually beneficially used for said purposes, and shall not exceed 0.26 cubic foot per second,

or its equivalent in case of rotation, measured at the point of diversion from the stream. The point of diversion is located in the SW¹/₄ SE¹/₄, Section 20, Township 2 North, Range 10 West, W.M.

The amount of water used for irrigation, together with the amount secured under any other right existing for the same lands, shall be limited to - - - - - of one cubic foot per second per acre,

and shall conform to such reasonable rotation system as may be ordered by the proper state officer.

A description of the place of use under the right hereby confirmed, and to which such right is appurtenant, is as follows:

SW¹/₄ NE¹/₄
Lot 2 (SE¹/₄ NW¹/₄)
Lot 3 (NE¹/₄ SW¹/₄)
Lot 4 (SE¹/₄ SW¹/₄)
NW¹/₄ SE¹/₄
Section 20
Township 2 North, Range 10 West, W.M.

The right to the use of the water for the purposes aforesaid is restricted to the lands or place of use herein described.

WITNESS the signature of the State Engineer, affixed

this date. AUGUST 13 1959

.....LEWIS A. STANLEY.....
State Engineer

STATE OF OREGON
COUNTY OF TILLAMOOK
CERTIFICATE OF WATER RIGHT

This Is to Certify, That CITY OF ROCKAWAY

of Rockaway, State of Oregon, has made proof to the satisfaction of the STATE ENGINEER of Oregon, of a right to the use of the waters of McMillan Creek a tributary of Nehalem River for the purpose of municipal use

under Permit No. 25396 of the State Engineer, and that said right to the use of said waters has been perfected in accordance with the laws of Oregon; that the priority of the right hereby confirmed dates from March 17, 1958

that the amount of water to which such right is entitled and hereby confirmed, for the purposes aforesaid, is limited to an amount actually beneficially used for said purposes, and shall not exceed 0.26 cubic foot per second

or its equivalent in case of rotation, measured at the point of diversion from the stream. The point of diversion is located in the SW 1/4 SE 1/4, Sec. 20, T. 2 N., R. 10 W., W.M.

The amount of water used for irrigation, together with the amount secured under any other right existing for the same lands, shall be limited to - - - - - of one cubic foot per second per acre,

and shall conform to such reasonable rotation system as may be ordered by the proper state officer. A description of the place of use under the right hereby confirmed, and to which such right is appurtenant, is as follows:

W 1/2
Section 5
T. 1 N., R. 10 W., W.M.
SW 1/4 NE 1/4
Lot 2 (SE 1/4 NW 1/4)
Lot 3 (NE 1/4 SW 1/4)
Lot 4 (SE 1/4 SW 1/4)
NW 1/4 SE 1/4
Section 20
W 1/2
Section 29
W 1/2
Section 32
T. 2 N., R. 10 W., W.M.

The right to the use of the water for the purposes aforesaid is restricted to the lands or place of use herein described.

WITNESS the signature of the State Engineer, affixed this date. DECEMBER 3 1962

CHRIS L. WHEELER
State Engineer

STATE OF OREGON
COUNTY OF TILLAMOOK
CERTIFICATE OF WATER RIGHT

This Is to Certify, That CITY OF ROCKAWAY

of Rockaway, State of Oregon, has made proof to the satisfaction of the STATE ENGINEER of Oregon, of a right to the use of the waters of McMillan Creek a tributary of Nehalem River for the purpose of municipal use

under Permit No. 26296 of the State Engineer, and that said right to the use of said waters has been perfected in accordance with the laws of Oregon; that the priority of the right hereby confirmed dates from July 30, 1959

that the amount of water to which such right is entitled and hereby confirmed, for the purposes aforesaid, is limited to an amount actually beneficially used for said purposes, and shall not exceed 0.50 cubic foot per second

or its equivalent in case of rotation, measured at the point of diversion from the stream. The point of diversion is located in the SW 1/4 SE 1/4, Sec. 20, T. 2 N., R. 10 W., W.M.

The amount of water used for irrigation, together with the amount secured under any other right existing for the same lands, shall be limited to - - - - - of one cubic foot per second per acre,

and shall conform to such reasonable rotation system as may be ordered by the proper state officer.

A description of the place of use under the right hereby confirmed, and to which such right is appurtenant, is as follows:

W 1/2
Section 5
T. 1 N., R. 10 W., W.M.
SW 1/4 NE 1/4
Lot 2 (SE 1/2 NW 1/4)
Lot 3 (NE 1/4 SW 1/4)
Lot 4 (SE 1/4 SW 1/4)
NW 1/4 SE 1/4
Section 20
W 1/2
Section 29
W 1/2
Section 32
T. 2 N., R. 10 W., W.M.

The right to the use of the water for the purposes aforesaid is restricted to the lands or place of use herein described.

WITNESS the signature of the State Engineer, affixed

this date. DECEMBER 3 1962

CHRIS L. WHEELER
State Engineer

STATE OF OREGON
COUNTY OF TILLAMOOK
CERTIFICATE OF WATER RIGHT

This Is to Certify, That CITY OF ROCKAWAY, A Municipal Corporation

of Rockaway, State of Oregon, has made proof to the satisfaction of the STATE ENGINEER of Oregon, of a right to the use of the waters of Heitmiller Creek

a tributary of Pacific Ocean for the purpose of municipal

under Permit No. 27861 of the State Engineer, and that said right to the use of said waters has been perfected in accordance with the laws of Oregon; that the priority of the right hereby confirmed dates from February 16, 1962

that the amount of water to which such right is entitled and hereby confirmed, for the purposes aforesaid, is limited to an amount actually beneficially used for said purposes, and shall not exceed 0.50 cubic foot per second

or its equivalent in case of rotation, measured at the point of diversion from the stream. The point of diversion is located in the NE 1/4 SE 1/4, Section 5, T. 1 N., R. 10 W., W. M., North 70 deg. 31' East, 4270 feet from SW Corner, Section 5.

The amount of water used for irrigation, together with the amount secured under any other right existing for the same lands, shall be limited to ----- of one cubic foot per second per acre,

and shall conform to such reasonable rotation system as may be ordered by the proper state officer.

A description of the place of use under the right hereby confirmed, and to which such right is appurtenant, is as follows:

- W 1/2
- SW 1/4 SE 1/4
- Section 5
- E 1/2 SE 1/4
- Section 6
- T. 1 N., R. 10 W., W. M.
- SW 1/4 NE 1/4
- SE 1/4 NW 1/4
- E 1/2 SW 1/4
- W 1/2 SE 1/4
- Section 20
- SW 1/4 NE 1/4
- W 1/2
- Section 29
- W 1/2
- W 1/2 SE 1/4
- Section 32
- T. 2 N., R. 10 W., W. M.

The right to the use of the water for the purposes aforesaid is restricted to the lands or place of use herein described.

WITNESS the signature of the State Engineer, affixed

this date. February 28, 1973

CHRIS L. WHEELER
State Engineer

STATE OF OREGON

COUNTY OF

TILLAMOOK

CERTIFICATE OF WATER RIGHT

This Is to Certify, That CITY OF ROCKAWAY

of P.O. Box 35, Rockaway, State of Oregon, 97136, has made proof to the satisfaction of the Water Resources Director, of a right to the use of the waters of Jetty Creek

a tributary of Pacific Ocean for the purpose of municipal

under Permit No. 34498 and that said right to the use of said waters has been perfected in accordance with the laws of Oregon; that the priority of the right hereby confirmed dates from December 8, 1969 that the amount of water to which such right is entitled and hereby confirmed, for the purposes aforesaid, is limited to an amount actually beneficially used for said purposes, and shall not exceed 1.0 cubic foot per second

or its equivalent in case of rotation, measured at the point of diversion from the stream. The point of diversion is located in the Lot 3 (NE 1/4 SE 1/4), Section 17, T. 2 N., R. 10 W., W. M., 1700 feet North and 300 feet West from the SE Corner, Section 17

The amount of water used for irrigation, together with the amount secured under any other right existing for the same lands, shall be limited to ----- of one cubic foot per second per acre,

and shall conform to such reasonable rotation system as may be ordered by the proper state officer.

A description of the place of use under the right hereby confirmed, and to which such right is appurtenant, is as follows:

NE 1/4 SE 1/2
1/2 SE 1/4
Section 17
N 1/2 NE 1/4
SW 1/4 NE 1/4
E 1/2 NW 1/4
E 1/2 SW 1/4
NW 1/4 SE 1/4
Section 20
W 1/2
Section 29

NW 1/4 NW 1/4
1/2 NW 1/4
SW 1/4
W 1/2 SE 1/4
Section 32
T. 2 N., R. 10 W., W. M.
W 1/2 NW 1/4
SW 1/4
Section 5
All
Section 6
T. 1 N., R. 10 W., W. M.

The right to the use of the water for the purposes aforesaid is restricted to the lands or place of use herein described and is subject to the existing minimum flow policies established by the Water Policy Review Board.

WITNESS the signature of the Water Resources Director, affixed

this date. April 30, 1979

[Signature]
Water Resources Director

STATE OF OREGON

WATER DIVISION NO. 1 COUNTY OF TILLAMOOK

CERTIFICATE OF WATER RIGHT

(For rights perfected under original, enlargement or secondary permits)

This is to Certify, That MAY ENRIGHT

of Marbatten Beach, State of Oregon, has made proof to the satisfaction of the STATE WATER BOARD of Oregon, of a right to the use of the waters of Spring Creek and Steinhelber Creek, a tributary of Nehalem Bay, for the purpose of Municipal supply

under Permit No. 1081 of the State Engineer, and that said right to the use of said waters has been perfected in accordance with the laws of Oregon and duly confirmed by order of the STATE WATER BOARD of Oregon, made and entered of record in the Record of Proceedings of said Board, at Salem, in Volume 1, at page 191, on the 1st day of September, 1915; that the priority of the right hereby confirmed dates from February 15, 1912; that the amount of water to which such right is entitled and hereby confirmed, for the purposes aforesaid, is limited to an amount actually beneficially used for said purposes, and shall not exceed 0.50 cubic feet per second.

A description of the lands under such right, and to which the water hereby confirmed is appurtenant, or, if for other purposes, the place where such water is put to beneficial use, is as follows:

The pipe line terminates in the Northwest quarter of Northeast quarter of Section Thirty-two (32), Township Two (2) North, Range Ten (10) West of Willamette River, in Tillamook County, Oregon.

The right to the use of the water aforesaid hereby confirmed is restricted to the lands or place of use herein described.

Rights to the use of water for power purposes are limited to a period of forty years from the date of priority of the right, as herein set forth, subject to a preference right of renewal under the laws existing at the date of the expiration of the right for power purposes, as hereby confirmed and limited.

Witness the seal and signature of the STATE WATER BOARD affixed this 13th day of September, 1915.

STATE WATER BOARD

(SEAL OF STATE WATER BOARD)

By JOHN H. LEWIS, State Engineer, President

Attest: M. F. MERS, Secretary

STATE OF OREGON

COUNTY OF TILLAMOOK

PERMIT TO APPROPRIATE THE PUBLIC WATERS

THIS PERMIT IS HEREBY ISSUED TO

SHAWN VINCENT, FOR CITY OF ROCKAWAY BEACH
PO BOX 5; 276 HWY 101 S
ROCKAWAY BEACH, OREGON 97136

(503) 355-2291

The specific limits and conditions of the use are listed below.

APPLICATION FILE NUMBER: G-15716

SOURCE OF WATER: A WELL IN MCMILLAN CREEK BASIN

PURPOSE OR USE: MUNICIPAL USE

MAXIMUM RATE: 0.223 CUBIC FOOT PER SECOND

PERIOD OF USE: YEAR ROUND

DATE OF PRIORITY: FEBRUARY 28, 2002

WELL LOCATION: SE ¼ SW ¼, SECTION 20, T2N, R10W, W.M.; 840 FEET NORTH &
3550 FEET WEST FROM SE CORNER, SECTION 20

THE PLACE OF USE IS LOCATED AS FOLLOWS:

WITHIN THE SERVICE BOUNDARIES OF THE CITY

Measurement, recording and reporting conditions:

- A. Before water use may begin under this permit, a totalizing flow meter must be installed at each diversion point. The totalizing flow meter must be installed and maintained as identified in OAR 690-507-645. The permittee shall keep a complete record of the amount of water used each month and shall submit a report which includes the recorded water use measurements to the Department annually or more frequently as may be required by the Director. Further, the Director may require the permittee to report general water use information, including the place and nature of use of water under the permit.

- B. The permittee shall allow the watermaster access to the meter; provided however, where the meter is located within a private structure, the watermaster shall request access upon reasonable notice.

Within 3 years of permit issuance, the permittee shall submit a Water Management and Conservation Plan consistent with OAR Chapter 690, Division 86. The Director may approve an extension of this timeline to complete the required Water Management and Conservation Plan.

The city shall conduct riparian restoration along McMillan Creek.

STANDARD CONDITIONS

If substantial interference with a senior water right occurs due to withdrawal of water from any well listed on this permit, then use of water from the well(s) shall be discontinued or reduced and/or the schedule of withdrawal shall be regulated until or unless the Department approves or implements an alternative administrative action to mitigate the interference. The Department encourages junior and senior appropriators to jointly develop plans to mitigate interferences.

The wells shall be constructed in accordance with the General Standards for the Construction and Maintenance of Water Wells in Oregon. The works shall be equipped with a usable access port, and may also include an air line and pressure gauge adequate to determine water level elevation in the well at all times.

The use shall conform to such reasonable rotation system as may be ordered by the proper state officer.

Prior to receiving a certificate of water right, the permit holder shall submit the results of a pump test meeting the department's standards, to the Water Resources Department. The Director may require water level or pump test results every ten years thereafter.

Failure to comply with any of the provisions of this permit may result in action including, but not limited to, restrictions on the use, civil penalties, or cancellation of the permit.

This permit is for the beneficial use of water without waste. The water user is advised that new regulations may require the use of best practical technologies or conservation practices to achieve this end.

By law, the land use associated with this water use must be in compliance with statewide land-use goals and any local acknowledged land-use plan.


The use of water shall be limited when it interferes with any prior surface or ground water rights.

The Director finds that the proposed use(s) of water described by this permit, as conditioned, will not impair or be detrimental to the public interest.

Complete application of the water to the use shall be made on or before October 1, 2007. If the water is not completely applied before this date, and the permittee wishes to continue development under the permit, the permittee must submit an application for extension of time, which may be approved based upon the merit of the application.

Within one year after complete application of water to the proposed use, the permittee shall submit a claim of beneficial use, which includes a map and report, prepared by a Certified Water Rights Examiner (CWRE).

Issued January 30 , 2003


Paul R. Cleary, Director
Water Resources Department

REAL ESTATE TRANSACTIONS: Pursuant to ORS 537.330, in any transaction for the conveyance of real estate that includes any portion of the lands described in this permit, the seller of the real estate shall, upon accepting an offer to purchase that real estate, also inform the purchaser in writing whether any permit, transfer approval order, or certificate evidencing the water right is available and that the seller will deliver any permit, transfer approval order or certificate to the purchaser at closing, if the permit, transfer approval order or certificate is available.

CULTURAL RESOURCES PROTECTION LAWS: Permittees involved in ground-disturbing activities should be aware of federal and state cultural resources protection laws. ORS 358.920 prohibits the excavation, injury, destruction or alteration of an archeological site or object, or removal of archeological objects from public and private lands without an archeological permit issued by the State Historic Preservation Office. 16 USC 470, Section 106, National Historic Preservation Act of 1966 requires a federal agency, prior to any undertaking to take into account the effect of the undertaking that is included on or eligible for inclusion in the National Register. For further information, contact the State Historic Preservation Office at 503-378-4168, extension 232.



Appendix B

Water Use Reports

Water Use Report Based on Water Right



Cert:82449 OR *

CITY OF ROCKAWAY PO BOX 35 ROCKAWAY, OR 97136

Records per page:

Acre-feet (AF) of Water Used

Water Year*	Report ID	Facility	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Total Water Used	Irrigated Acres
2016	12070	WELL 1 / W	0.00	0.00	11.73	0.00	0.00	0.00	0.00	0.00	13.30	12.11	2.12	0.00	39.26	0.00
2016	12071	WELL 2 / E	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2015	12070	WELL 1 / W	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.32	0.00	2.32	0.00
2015	12071	WELL 2 / E	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2014	12070	WELL 1 / W	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2014	12071	WELL 2 / E	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2008	12070	WELL 1 / W	10.34	13.35	11.14	13.35	12.76	14.79	11.09	9.55	8.81	11.34	6.75	8.09	131.36	0.00
2008	12071	WELL 2 / E	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.03	0.04	0.00
2006	12070	WELL 1 / W	11.67	10.68	11.13	12.91	10.69	15.13	13.52	14.24	13.00	15.54	15.48	12.36	156.35	0.00
2005	12070	WELL 1 / W	4.27	13.55	12.81	11.73	8.12	12.00	11.57	11.98	0.12	0.03	14.31	13.69	114.18	0.00

1 2 3 4

*The water year is named for the calendar year in which it ends. Example: the 2014 water year begins Oct. 1, 2013 and ends Sep. 30, 2014.

- Water use is reported by point of diversion (POD), rather than by water right.
- If a POD is shared with multiple water rights, it is not feasible to separate out the amount used under the water right being queried from water used by other rights using this same POD.
- Monthly amounts indicate:
 - For diverted rights, the total amount diverted during the month;
 - For storage rights, the amount generally stored in the reservoir/pond during the month, as represented by the volume of water impounded on approximately the same day each month.
- Water Use amounts have all been converted to “acre-feet” (AF), regardless of the original measurement unit reported. One AF is the volume of water that will cover an acre of ground one foot deep = 325,850 gallons.
- Zeroes indicate that a report was received, stating that no water was used during those months; if a year is not listed, no report of water use was received for that year.

Water Use Report Based on Water Right



Permit: G 15325 *

VINCENT, SHAWN CITY OF ROCKAWAY BEACH PO BOX 5 276 HWY 101 S
ROCKAWAY BEACH, OR 97136

Records per page:

Acre-feet (AF) of Water Used

Water Year*	Report ID	Facility	Acre-feet (AF) of Water Used												Total Water Used	Irrigated Acres
			Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep		
2016	61051	MANHATTAN BEACH WELL	0.00	0.29	3.64	0.00	0.00	0.00	0.00	0.00	0.00	1.84	4.83	1.15	11.75	0.00
2015	61051	MANHATTAN BEACH WELL	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2014	61051	MANHATTAN BEACH WELL	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2008	61051	MANHATTAN BEACH WELL	0.00	0.00	1.46	0.00	0.30	0.00	0.60	0.00	0.48	2.03	0.00	0.00	4.87	
2006	61051	MANHATTAN BEACH WELL	0.33	0.11	0.09	2.02	0.00	0.47	1.90	1.09	0.82	2.10	0.38	0.00	9.30	
2005	61051	MANHATTAN BEACH WELL	0.03	0.06	0.08	0.00	0.00	0.00	0.03	0.13	0.02	0.11	0.10	0.00	0.57	
2004	61051	MANHATTAN BEACH WELL	1.24	2.47	0.00	0.00	0.00	1.12	0.00	0.00	2.20	1.27	0.17	0.82	9.31	
2003	61051	MANHATTAN BEACH WELL	0.98	1.37	1.68	0.33	3.31	0.00	0.00	0.85	0.00	1.47	0.31	1.49	11.79	

*The water year is named for the calendar year in which it ends. Example: the 2014 water year begins Oct. 1, 2013 and ends Sep. 30, 2014.

- Water use is reported by point of diversion (POD), rather than by water right.
- If a POD is shared with multiple water rights, it is not feasible to separate out the amount used under the water right being queried from water used by other rights using this same POD.
- Monthly amounts indicate:
 - For diverted rights, the total amount diverted during the month;
 - For storage rights, the amount generally stored in the reservoir/pond during the month, as represented by the volume of water impounded on approximately the same day each month.
- Water Use amounts have all been converted to "acre-feet" (AF), regardless of the original measurement unit reported. One AF is the volume of water that will cover an acre of ground one foot deep = 325,850 gallons.
- Zeroes indicate that a report was received, stating that no water was used during those months; if a year is not listed, no report of water use was received for that year.

Water Use Report Based on Water Right



Inchoate: T 11986 CF (REG) *

CITY OF ROCKAWAY BEACH C/O CITY MANAGER LUKE SHEPARD PO BOX 5
 ROCKAWAY, OR 97136 SHEPARD, LUKE CITY OF ROCKAWAY BEACH 2310 HWY
 101 N ROCKAWAY BEACH, OR 97136

Records per page:

Acre-feet (AF) of Water Used

Water Year*	Report ID	Facility	Acre-feet (AF) of Water Used												Total Water Used	Irrigated Acres
			Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep		
2016	12069	JETTY CR	22.91	23.18	27.99	26.39	25.84	30.76	27.77	29.70	34.46	38.96	39.57	30.77	358.30	0.00
2015	12069	JETTY CR	23.18	21.56	25.25	22.89	20.48	25.62	23.73	27.62	31.45	37.28	32.80	27.83	319.69	
2014	12069	JETTY CR	21.17	16.80	20.55	20.74	18.46	21.91	20.56	25.43	23.29	34.19	32.74	19.05	274.90	
2013	12069	JETTY CR	25.19	11.48	22.70	25.22	24.04	26.87	22.57	26.06	27.82	34.64	32.80	22.07	301.49	
2008	12069	JETTY CR	17.36	12.45	13.92	12.02	12.39	15.26	15.14	18.89	22.90	28.83	31.15	21.15	221.45	
2006	12069	JETTY CR	22.29	20.48	15.86	9.02	14.43	15.29	10.63	14.59	15.51	22.96	23.46	18.86	203.37	
2005	12069	JETTY CR	27.99	20.31	22.90	23.10	23.02	27.24	24.52	23.68	40.11	46.59	31.84	24.10	335.40	
2004	12069	JETTY CR	21.57	15.18	23.76	21.43	17.96	21.87	22.48	19.42	25.05	32.74	34.32	28.74	284.52	
2003	12069	JETTY CR	25.10	22.76	17.87	17.38	11.66	17.84	22.99	26.66	29.91	31.46	32.57	28.41	284.61	
2002	12069	JETTY CR	25.11	30.16	16.09	17.84	23.56	26.66	23.54	25.65	25.78	34.25	35.66	28.03	312.32	

*The water year is named for the calendar year in which it ends. Example: the 2014 water year begins Oct. 1, 2013 and ends Sep. 30, 2014.

- Water use is reported by point of diversion (POD), rather than by water right.
- If a POD is shared with multiple water rights, it is not feasible to separate out the amount used under the water right being queried from water used by other rights using this same POD.
- Monthly amounts indicate:
 - For diverted rights, the total amount diverted during the month;
 - For storage rights, the amount generally stored in the reservoir/pond during the month, as represented by the volume of water impounded on approximately the same day each month.
- Water Use amounts have all been converted to “acre-feet” (AF), regardless of the original measurement unit reported. One AF is the volume of water that will cover an acre of ground one foot deep = 325,850 gallons.
- Zeroes indicate that a report was received, stating that no water was used during those months; if a year is not listed, no report of water use was received for that year.



Appendix C

Water Conservation & Curtailment Ordinances

MODEL ORDINANCE REDUCING ALL WATER USES

ORDINANCE NO. _____

An Ordinance of the _____ (agency), Declaring a Water Shortage Emergency, Establishing Rules and Regulations for Allocating Available Water Resources, and Providing Penalties for Violation Thereof.

The _____ (governing body) of _____ (agency) does enact as follows:

Section 1. Purpose and Intent. The _____ (governing body) of _____ (agency) hereby declares that a water shortage emergency condition prevails in the area served by the _____ (agency) due to drought conditions and that the ordinary demands and requirements of water consumers cannot be satisfied without depleting the water supply of the _____ (agency) to the extent that there would be insufficient water for human consumption, sanitation, and fire protection.

In order to conserve the _____ (agency) water supply for the greatest public benefit with particular regard for domestic use, sanitation, and fire protection, this _____ (governing body) adopts the following regulations and restrictions on the delivery and consumption of water to take effect immediately and remain in effect until rescinded by ordinance.

The specific uses regulated or prohibited in the Ordinance are nonessential, and if allowed would constitute wasted water, and should be regulated.

Section 2. Definitions. For the purpose of the Ordinance, the following terms have the meaning given herein:

“Customer” any person using water supplied by the _____ (agency).

“Chief Officer” the _____ (Chief Officer) of the _____ (agency).

“Person” any person, firm, entity, partnership, association, corporation, company, or organization of any kind.

“Water” water from the _____ (agency), unless expressly provided otherwise or required by the contract.

Section 3. Application. The provisions of this Ordinance shall apply to all customers using water provided by the _____ (agency).

Section 4. Prohibiting Nonessential Water Use. Uses of water for residential purposes in excess of the following daily usage allotment are determined to be nonessential and are prohibited:

Section 5. Nonessential Residential Uses Defined. Uses of water for residential purposes in excess of the following daily usage allotment are determined to be nonessential:

(1) One or two residential units - Daily usage allotment

- a. One permanent resident _____ gallons
- b. Two permanent residents _____ gallons
- c. Three permanent resident _____ gallons
- d. Each additional permanent resident _____ gallons

(2) Multi-residential units - Daily usage allotment

(Three or more) for each permanent _____ gallons residence

Each customer in whose name water is supplied to a residence, or residences or apartments or other dwelling units, shall upon request of the _____ (Chief Officer) advise the utility under penalty of perjury the number of permanent residents using water supplied to the residence, residences, apartments, or other dwelling units. If the customer fails to advise the _____ (Chief Officer), each residence, apartment or dwelling unit shall be permitted the water allocation herein provided for one permanent resident.

(The usage allotments established for three or more residential units should be based on the number of residential units rather than number of persons because the method of computation of allotments will more

accurately reflect the true number of permanent residents living in the units over a period of time in light of the turnover and vacancy rates, the difficulty of ascertaining the true number of permanent residents residing and the available census and other statistical data.)

Section 6. Nonessential Commercial Uses Defined. Uses of water for commercial purposes in excess of the following amounts are determined to be nonessential and are prohibited:

1. The use of water for schools, parks, recreation areas, golf courses, community gardens, residential gardens, cemeteries, and similar recreation or memorial type facilities in excess of 75% of the amount consumed in (the same time period of the previous year).
2. The use of water for nursery facilities, restaurants, shopping centers, filling stations, health and swim clubs, and all other commercial uses in excess of 75% of the amount consumed in (the same time period as the previous year).

Section 7. Nonessential Industrial Uses Defined. Uses of water for industrial purposes in excess of the following amounts are determined to be nonessential:

1. The use of water for manufacturing, food processing, cooling or cleaning of equipment in excess of 75% of the amount consumed in (the same time period as the previous year).
2. The use of water for agricultural irrigation in excess of 75% of the amount consumed in (the same time period as the previous year).

Section 8. Other Nonessential Uses. All other uses of water not expressly set forth in this Ordinance in excess of 75% of the amount consumed in (the same time period as the previous year) are determined to be nonessential.

Section 9. Determination of Amount of Prior Water Consumption. The amount of water consumed in (the same time period as the previous year) shall be determined by _____ (agency) from its records. Where no such records exist, the amount shall be the average use of similar

existing services as determined by the _____ (agency) from its records.

Section 10. Regulation of Applications for New Water Service. No applications for new, additional, further expanded, or increased-in-size water service connections, meters, service lines, pipeline extensions, mains, or other water service facilities of any kind shall be allowed, approved, or installed during the time this Ordinance is in effect.

Section 11. Penalties and Discontinuance of Service. Violations of any provision of this Ordinance shall be punished as follows:

First violation	Fine - _____
Second violation within 6-month period	Fine - _____
Third violation, and subsequent violations	Fine - _____

The _____ (Chief Officer) may, after written or personal warning disconnect the water service of any customer that repeatedly violates this ordinance. Water service disconnected shall be restored only upon payment of any turn-on charge and any other costs incurred by the _____ (agency) and suitable assurances that the action causing the discontinuance will not be repeated.

In addition to the foregoing, the _____ (agency) may, prior to restoration of service, install a flow-restrictive device on the customer's service.

Section 12. Enforcement. Each _____ (appropriate law officer) of the _____ (appropriate police force) shall diligently enforce the provisions of this Ordinance. The _____ (Chief Officer) and all employees of the _____ (agency), Public Works Department, and Fire Department, have the duty and are hereby authorized to enforce the provisions of this Ordinance.

Section 13. Variances. The _____ (Chief Officer) may, in writing, adjust any consumer's usage allotment if it is determined that due to unusual circumstances to fail to do so would cause an emergency condition affecting health, sanitation, or fire protection of the applicant or the public; and may grant such adjustment in the case of a mixed residential and nonresidential use if it is found that such

adjustment is necessary to place an equivalent allotment burden on consumers.

The _____ (governing body) shall ratify or revoke any variance or adjustment. Any variance or adjustment so ratified, may be revoked by later action of the _____ (governing body).

No variance or adjustment shall be retroactive or otherwise justify any violation of this Ordinance occurring prior to issuance of temporary variance or adjustment.

Section 14. Emergency Ordinance. This Ordinance is hereby declared to be necessary for the immediate preservation of the public peace, health, and safety and shall take effect and be in force upon its adoption by the members of the _____ (governing body). Due to severe drought conditions in the area _____ (agency), it is imperative that this Ordinance become effective immediately to protect existing water supplies for human consumption, sanitation, and fire protection.

Section 15. Ordinance Controlling. The provisions of this Ordinance shall prevail and control in the event of any inconsistency between this Ordinance and any other rules or regulations of the _____ (agency).

Section 16. Severability Clause. If any section, subsection, sentence, clause, or phrase of this Ordinance is for any reason held to be unconstitutional, such decision shall not affect the remaining portions of this Ordinance. The _____ (governing body) of the _____ (agency) declares that it would have passed each phrase thereof, irrespective of the fact that any one or more such provisions be declared unconstitutional.

Section 17. Publication. The _____ (Clerk's full title) is hereby directed to publish this Ordinance for the period and in the manner required by the _____ (appropriate legal reference).

ORDER PUBLISHED THIS _____ day of _____. 20__.

ADOPTED THIS _____ day of _____. 20__, (by the following vote):

AYES:

NOS:

ABSENT:

Signed: _____

Attest: _____

(Clerk)

SAMPLE

MODEL ORDINANCE

CATASTROPHIC WATER SHORTAGE EMERGENCY

ORDINANCE NO. _____

An Ordinance of the _____ (agency), Declaring a Catastrophic Water Shortage Emergency, Establishing Rules and Regulations for Allocating Available Water Resources, and Providing Penalties for Violation Thereof.

The _____ (governing body) of _____ (agency) does enact as follows:

Section 1. Purpose and Intent. The _____ (governing body) of _____ (agency) hereby declares that a water shortage emergency condition prevails in the area served by the _____ (agency) due to drought declaration specifying human consumption exemption (natural disaster or human caused catastrophe) and that the ordinary demands and requirements of water consumers cannot be satisfied without depleting the water supply of the _____ (agency) to the extent that there would be insufficient water for human consumption, sanitation, and fire protection.

In order to conserve the _____ (agency) water supply for the greatest public benefit with particular regard for domestic use, sanitation, and fire protection, this _____ (governing body) adopts the following regulations and restrictions on the delivery and consumption of water to take effect immediately and remain in effect until rescinded by ordinance.

The specific uses regulated or prohibited in the Ordinance are nonessential, and if allowed would constitute wasted water, and should be regulated.

Section 2. Definitions. For the purpose of the Ordinance, the following terms have the meaning given herein:

- “Customer” any person using water supplied by the _____ (agency).
- “Chief Officer” the _____ (Chief Officer) of the _____ (agency).
- “Person” any person, firm, entity, partnership, association, corporation, company, or organization of any kind.
- “Water” water from the _____ (agency), unless expressly provided otherwise or required by the contract.

Section 3. Application. The provisions of this Ordinance shall apply to all customers using water provided by the _____ (agency).

Section 4. Prohibiting Nonessential Water Use. Uses of water for residential purposes in excess of the following daily usage allotment are determined to be nonessential and are prohibited:

Section 5. Nonessential Residential Uses Defined. Uses of water for residential purposes in excess of the following daily usage allotment are determined to be nonessential:

(1) One or two residential units - Daily usage allotment

- a. One permanent resident _____ gallons
- b. Two permanent residents _____ gallons
- c. Three permanent resident _____ gallons
- d. Each additional permanent resident _____ gallons

(2) Multi-residential units - Daily usage allotment

(Three or more) for each permanent _____ gallons residence

Each customer in whose name water is supplied to a residence, or residences or apartments or other dwelling units, shall upon request of the _____ (Chief Officer) advise the utility under penalty of perjury the number of permanent residents using water supplied to the residence, residences, apartments, or other dwelling units. If the customer fails to advise the _____ (Chief Officer), each

residence, apartment or dwelling unit shall be permitted the water allocation herein provided for one permanent resident.

(The usage allotments established for three or more residential units should be based on the number of residential units rather than number of persons because the method of computation of allotments will more accurately reflect the true number of permanent residents living in the units over a period of time in light of the turnover and vacancy rates, the difficulty of ascertaining the true number of permanent residents residing and the available census and other statistical data.)

(3) All irrigation uses, use of water features, filling of pools or ponds, exterior washing of cars, driveways, buildings or other equipment except for the purposes of safety or fire fighting purposes are prohibited.

Section 6. Nonessential Commercial Uses Defined. Uses of water for commercial purposes in excess of the following amounts are determined to be nonessential and are prohibited:

1. The use of water for schools, parks, recreation areas, golf courses, community gardens, residential gardens, cemeteries, and similar recreation or memorial type facilities for purposes other than human consumption and sanitation.
2. The use of water for nursery facilities, restaurants, shopping centers, filling stations, health and swim clubs, and all other commercial uses for purposes other than human consumption and sanitation.

Section 7. Nonessential Industrial Uses Defined. Uses of water for industrial purposes in excess of the following amounts are determined to be nonessential:

1. The use of water for manufacturing, food processing, cooling or cleaning of equipment for purposes other than for safety, fire protection human consumption and sanitation.

Section 8. Other Nonessential Uses. All other uses of water not expressly set forth in this Ordinance for purposes other than safety, fire fighting, human consumption, livestock watering and sanitation.

Section 9. Regulation of Applications for New Water Service. No applications for new, additional, further expanded, or increased-in-size water service connections, meters, service lines, pipeline extensions, mains, or other water service facilities of any kind shall be allowed, approved, or installed during the time this Ordinance is in effect..

Section 10. Penalties and Discontinuance of Service. Violations of any provision of this Ordinance shall be punished as follows:

First violation	Fine - _____
Second violation within 6-month period	Fine - _____
Third violation, and subsequent violations	Fine - _____

The _____ (Chief Officer) may, after written or personal warning disconnect the water service of any customer that repeatedly violates this ordinance. Water service disconnected shall be restored only upon payment of any turn-on charge and any other costs incurred by the _____ (agency) and suitable assurances that the action causing the discontinuance will not be repeated.

In addition to the foregoing, the _____ (agency) may, prior to restoration of service, install a flow-restrictive device on the customer's service.

Section 11. Enforcement. Each _____ (appropriate law officer) of the _____ (appropriate police force) shall diligently enforce the provisions of this Ordinance. The _____ (Chief Officer) and all employees of the _____ (agency), Public Works Department, and Fire Department, have the duty and are hereby authorized to enforce the provisions of this Ordinance.

Section 12. Variances. The _____ (Chief Officer) may, in writing, adjust any consumer's usage allotment if it is determined that due to unusual circumstances to fail to do so would cause an emergency condition affecting health, sanitation, or fire protection of the applicant or the public; and may grant such adjustment in the case of a mixed residential and nonresidential use if it is found that such

adjustment is necessary to place an equivalent allotment burden on consumers.

The _____ (governing body) shall ratify or revoke any variance or adjustment. Any variance or adjustment so ratified, may be revoked by later action of the _____ (governing body).

No variance or adjustment shall be retroactive or otherwise justify any violation of this Ordinance occurring prior to issuance of temporary variance or adjustment.

- Section 13. Emergency Ordinance. This Ordinance is hereby declared to be necessary for the immediate preservation of the public peace, health, and safety and shall take effect and be in force upon its adoption by the members of the _____ (governing body). Due to severe drought conditions in the area _____ (agency), it is imperative that this Ordinance become effective immediately to protect existing water supplies for human consumption, sanitation, and fire protection.
- Section 14. Ordinance Controlling. The provisions of this Ordinance shall prevail and control in the event of any inconsistency between this Ordinance and any other rules or regulations of the _____ (agency).
- Section 15. Severability Clause. If any section, subsection, sentence, clause, or phrase of this Ordinance is for any reason held to be unconstitutional, such decision shall not affect the remaining portions of this Ordinance. The _____ (governing body) of the _____ (agency) declares that it would have passed each phrase thereof, irrespective of the fact that any one or more such provisions be declared unconstitutional.

Section 16. Publication. The _____ (Clerk's full title) is hereby directed to publish this Ordinance for the period and in the manner required by the _____ (appropriate legal reference).

ORDER PUBLISHED THIS _____ day of _____. 20__.

ADOPTED THIS _____ day of _____. 20__, (by the following vote):

AYES:

NOS:

ABSENT:

Signed: _____

Attest: _____

(Clerk)

City of Rockaway Beach
Water Management & Conservation Plan



Appendix D

Oregon Administrative Rule 690-086

WATER RESOURCES DEPARTMENT

DIVISION 86

WATER MANAGEMENT AND CONSERVATION PLANS

690-086-0010

Purpose

(1) The Water Resources Commission has adopted a statewide policy on Conservation and Efficient Water Use (OAR 690-410-0060). The policy requires major water users and suppliers to prepare water management and conservation plans. These rules provide a process to ensure the efficient use of the state's water resources and to facilitate water supply planning consistent with water supplier and Department capabilities. The Commission shall evaluate implementation of these rules within three years and every three years thereafter.

(2) Many regions of Oregon face periodic and increasingly frequent water shortages during summer periods. Urbanization is resulting in a continually expanding need for municipal water supplies. In addition, many communities are faced with the need to reduce their impacts on the resource in response to state or federal listings of stream-flow dependant species as sensitive, threatened or endangered, water quality problem, and other flow issues. It is increasingly important to the state's economy to maintain adequate stream flows to support aquatic life, provide recreational opportunities and maintain water quality. The continued implementation of conservation measures can help restore streamflows, stabilize water supplies and provide for future needs for economic development and growth.

(3) Pursuant to ORS 540.610(3) the use of water at a rate or duty which is less than the maximum amount allowed under a water right that is achieved through improved water management practices is not a forfeiture under certain circumstances. However, conserved water may only be used on additional acres or for other purposes not included in the original right after allocation of conserved water under ORS 537.455 to 537.500 or under other specific statutory authorizations.

(4) Effective water management requires an evaluation of the adequacy of water supplies to meet current and future needs, identification of planned modifications in water systems, and development of new water supplies. However, the approval of a water management and conservation plan shall not substitute for compliance with Statewide Planning Goals or any other comprehensive land use planning requirement or constitute approval of applications for water rights, water reservations, water storage facilities, transfers, permit amendments, or extensions of time for permits.

(5) Water management and conservation plans will provide information important in water resources planning and management. In addition, the plans may provide support for applications for water use permits and water right transfers, permit amendments, and requests for extensions of permits, approvals of exchanges, and reservations of water. Due regard shall be given to any relevant approved water management and conservation plans during Department consideration of these applications and requests.

(6) Regional cooperation will improve water management and help to facilitate implementation of conservation measures. Water suppliers required under OAR 690-086-0010 to 690-086-0920 to prepare water management and conservation plans, and any other suppliers or users, may jointly submit a single plan that addresses the suppliers' conservation opportunities and water development needs.

(7) A water management and conservation plan that has been approved under these rules may, at the option of the water supplier, be used to satisfy a condition requiring preparation of a conservation plan in an emergency use permit issued pursuant to OAR 690-019-0040 and a requirement for submittal of a curtailment plan in times of a declared or likely drought under an order issued pursuant to ORS 536.780 and OAR 690-019-0090.

(8) Many water use permits that have been issued to water suppliers include conditions requiring preparation of water conservation, long-term water supply, and other water management plans. These rules provide standards for the preparation of such plans. Unless other more specific or stringent requirements are included in a permit, water management and conservation plans that have been approved under OAR 690-086-0915 shall be deemed to meet the permit condition.

Stat. Auth.: ORS 536.027, ORS 537.211 & ORS 540.572
Stats. Implemented: ORS 537.230, ORS 537.630 & ORS 539.010
Hist.: WRD 11-1994, f. & cert. ef. 9-21-94; WRD 4 2002, f. & cert. ef. 11-1-02

Definitions

690-086-0020

General Definitions

As used in OAR 690-086-0010 to 690-086-0920:

(1) "Affected local governments" means any local government as defined in OAR 690-005-0015, within whose jurisdiction the diversion, conveyance, or use of water is established or proposed within the context of the water management and conservation plan.

(2) "Commission" means the Water Resources Commission.

(3) "Conservation" has the meaning provided in OAR 690-400-0010.

NOTE: OAR 690-400-0010(5) defines conservation as eliminating waste or otherwise improving efficiency in the use of water while satisfying beneficial uses by modifying the technology or method for diverting, transporting, applying or recovering the water; by changing management of water use; or by implementing other measures.

(4) "Department" means the Water Resources Department.

(5) "Director" means the Director of the Water Resources Department or designee.

(6) "Waste" has the meaning provided in OAR 690-400-0010.

NOTE: OAR 690-400-0010(16) defines waste as the continued use of more water than is needed to satisfy the specific beneficial uses for which a right was granted. The need for water shall be based on using the technology and management practices that provide for the efficient use of water considering:

(a) The economic feasibility of use of the technology and management practices by the water user;

(b) The environmental impacts of making modifications;

(c) The available proven technology;

(d) The time needed to make modifications;

(e) Local variations in soil type and weather; and

(f) Relevant water management plans and subbasin conservation plans.

Stat. Auth.: ORS 536.027, ORS 537.211 & ORS 540.572

Stats. Implemented: ORS 537.230, ORS 537.630 & ORS 539.010

Hist.: WRD 11-1994, f. & cert. ef. 9-21-94; WRD 4 2002, f. & cert. ef. 11-1-02

690-086-0030

Definitions for Municipal Water Suppliers

As used in OAR 690-086-0100 to 690-086-0170 and 690-086-0900 to 690-086-0920:

(1) "Authorized water uses" means all water uses known and approved by a municipal water supplier. These uses include all metered uses and any other approved uses such as fire-fighting, fire training, system operation needs, reuse, or miscellaneous uses.

(2) "Benchmark" means the specific incremental activities that a municipal water supplier plans to have completed in implementing conservation measures.

(3) "Extended permit" means a municipal or quasi-municipal water use permit conditioned by an extension order under OAR chapter 690, division 315 or 320 to provide that diversion of water beyond the maximum rate diverted under the permit or previous extension(s) shall only be authorized upon issuance of a final order approving a water management and conservation plan.

(4) "Low water use landscaping" means conserving water through designing landscapes for low water use, irrigating efficiently, improving soil and planting low water use plants.

(5) "Metering" means using water meters or other continuous recording devices to measure and to maintain a record of all water diverted and delivered.

(6) "Municipal water supplier" means a publicly or privately owned water distribution system that delivers potable water for community needs, either to individual customers or another distribution system, or that delivers water primarily for commercial or industrial uses.

(7) "System leak detection" means a program to monitor leakage throughout the transmission and distribution systems of a municipal water supplier.

(8) "System leakage" means all water that is lost from a municipal water supply system, not including major breaks that are expeditiously repaired, and un-metered authorized or unauthorized uses.

(9) "Water audit" means an analysis of a municipal water supply system that includes a thorough accounting of all water into and out of the system to identify system leakage and metered or estimated use for authorized and unauthorized water uses. The audit also includes an analysis of the water supplier's own water use to identify alternatives to increase efficiency.

(10) "Water curtailment element" means a program to accomplish a specific reduction in the amount of water used or lost within a specific time in response to an emergency or other short-term shortage.

(11) "Water service connections" means water supply connections to the water delivery system, including the water supplier's own connections, but does not include connections for uses such as fire hydrants, fire sprinkler systems with flow alarms or detector-checks, water line blow-offs and drains, stand-by emergency interties, valve controlled drinking fountains or other similar intermittently used equipment or facilities.

Stat. Auth.: ORS 536.027, ORS 537.211 & ORS 540.572

Stats. Implemented: ORS 537.230, ORS 537.630 & ORS 539.010

Hist.: WRD 11-1994, f. & cert. ef. 9-21-94; WRD 4 2002, f. & cert. ef. 11-1-02, Renumbered from 690-086-0110

690-086-0040

Definitions for Agricultural Water Suppliers

As used in OAR 690-086-0210 to 690-086-0920:

(1) "Agricultural water supplier" means any public or private organization, including but not limited to an irrigation district formed under ORS Chapter 545, a drainage district formed under ORS Chapter 547, a water improvement district formed under ORS Chapter 552, a water control district formed under ORS Chapter 553, a corporation organized under ORS Chapter 554, an unincorporated private association or a ditch company, the primary purpose of which is to supply water to others for agricultural uses.

(2) "Agricultural water measurement" means using measuring devices, including but not limited to weirs, flumes, submerged orifices, gaging stations, and meters, to quantify the rate of flow and the volume of water in a water delivery system.

(3) "Water allocation/curtailment element" means a program to equitably allocate, under existing priorities, a reduced water supply among the water right holders dependent on the supply in response to an emergency or other short-term shortage.

Stat. Auth.: ORS 536.027, 537.211 and 540.572

Stats. Implemented: ORS 537.230, ORS 537.630 & ORS 539.010

Hist.: WRD 11-1994, f. & cert. ef. 9-21-94; WRD 4 2002, f. & cert. ef. 11-1-02, Renumbered from 690-086-0210

Municipal Water Management and Conservation Plans

690-086-0100

Applicability

- (1) Municipal water suppliers are encouraged to prepare water management and conservation plans, but are not required to do so unless a plan is prescribed by a condition of a water use permit; a permit extension; or another order or rule of the Commission.
- (2) Water management and conservation plans submitted in order to comply with a permit extension order issued after November 1, 2002, are subject to the requirements of these rules.
- (3) Until November 1, 2003, water management and conservation plans submitted for purposes other than to comply with a permit extension order issued after the effective date of these rules shall be reviewed under OAR chapter 690, division 86 adopted by the Commission in 1994, unless the water supplier requests the Department to apply the standards in these rules. After November 1, 2003, all new and updated water management and conservation plans are subject to these rules.

Stat. Auth.: ORS 536.027, ORS 537.211 & ORS 540.572
Stats. Implemented: ORS 537.230, ORS 537.630 & ORS 539.010
Hist.: WRD 4 2002, f. & cert. ef. 11-1-02

690-086-0110 [Renumbered to 690-086-0030]

690-086-0120

General Provisions

- (1) Each municipal water supplier required to submit a water management and conservation plan shall exercise diligence in implementing the approved plan and shall update and resubmit a plan consistent with the requirements of these rules as prescribed during plan approval.
- (2) Benchmarks and implementation schedules for conservation measures and other water supply development activities may be modified through the subsequent approval of an updated plan.
- (3) Progress reports submitted by municipal water suppliers will be used in determining whether five-year benchmarks are being met, whether the Department will authorize additional diversion of water under extended permits, and/or if schedule changes proposed in updated plans are reasonable and appropriate.
- (4) Progress reports submitted by municipal water suppliers shall include:
 - (a) A list of the benchmarks established under OAR 690-086-0150 and a description of the progress of the municipal water supplier in implementing the associated conservation or other measure;
 - (b) Average monthly and daily diversions under each right held by the water supplier for the previous five years;
 - (c) A description of the results of the annual water audit required under OAR 690-086-0150(4)(a); and
 - (d) A comparison of quantities of water used in each sector as identified and described in OAR 690-086-0140(6) with the quantities of water used in each sector for the previous five years.
- (5) Upon receipt of a progress report the Department shall give public notice in the weekly notice published by the Department and provide an opportunity for written public comment. The Department shall provide copies of any comments received to the municipal water supplier.
- (6) A master plan prepared under the requirements of the Department of Human Resources Health Division or the water supply element of a public facilities plan prepared under the requirements of the Department of Land Conservation and Development which substantially meets the requirements of OAR 690-086-0125 to 690-086-0170 may be submitted to meet the requirements of these rules.
- (7) In the development of a water management and conservation plan, each municipal water supplier shall consult with the planning departments or appropriate officials of affected local governments to obtain information related to demand projections in comprehensive land use plans early in the development of the plan.

(8) At least 30 days prior to submitting a draft plan to the Department, a municipal water supplier shall make the draft plan available for review by each affected local government along with a request for comments relating to consistency with the local government's comprehensive land use plan.

(9) Each municipal water supplier preparing a water management and conservation plan is encouraged to develop and implement a program to involve the supplier's customers in the preparation of the plan. Recommendations include making the plan available for public inspection and conducting public meetings to provide information and gather input on the plan.

Stat. Auth.: ORS 536.027, ORS 537.211 & ORS 540.572
Stats. Implemented: ORS 537.230, ORS 537.630 & ORS 539.010
Hist.: WRD 11-1994, f. & cert. ef. 9-21-94; WRD 4 2002, f. & cert. ef. 11-1-02

690-086-0125

Municipal Water Supplier Plan Elements

A water management and conservation plan submitted by a municipal water supplier shall include:

- (1) A municipal water supplier description as described under OAR 690-086-0140;
- (2) A municipal water conservation element as described under OAR 690-086-0150;
- (3) A municipal water curtailment element as described under OAR 690-086-0160;
- (4) A municipal water supply element as described under OAR 690-086-0170;
- (5) A list of the affected local governments to whom the draft plan was made available pursuant to OAR 690-086-0120(6) and a copy of any comments on the plan provided by the local governments;
- (6) A proposed date for submittal of an updated plan within no more than 10 years based on the proposed schedule for implementation of conservation measures, any relevant schedules for other community planning activities, and the rate of growth or other changes expected by the water supplier; or an explanation of why submittal of an updated plan is unnecessary and should not be required by the Department; and
- (7) If the municipal water supplier is requesting additional time to implement metering as required under OAR 690-086-0150(4)(b) or a benchmark established in a previously approved plan, documentation showing additional time is necessary to avoid unreasonable and excessive costs.

Stat. Auth.: ORS 536.027, ORS 537.211 & ORS 540.572
Stats. Implemented: ORS 537.230, ORS 537.630 & ORS 539.010
Hist.: WRD 4 2002, f. & cert. ef. 11-1-02

690-086-0130

Criteria for Approval of a Plan Submitted by a Municipal Water Supplier

In order to approve a plan by a municipal water supplier under OAR 690-086-0915, the Department must find that:

- (1) The plan includes each of the required elements under OAR 690-086-0125;
- (2) The projections of future water need in the water management and conservation plan are reasonable and consistent with available land use plans and the municipal water supplier has demonstrated a need for the quantity of water to be diverted during the next 20 years under each permit held by the supplier;
- (3) For each of the water conservation measures required under OAR 690-086-0150(4) and, as applicable, 690-086-0150(5), the plan includes a reasonable and appropriate schedule with five year benchmarks for implementation of conservation activities;
- (4) If applicable, for each of the water conservation measures required under OAR 690-086-0150(6), the plan includes:

- (a) A reasonable and appropriate schedule with five year benchmarks for implementation of conservation activities; or
- (b) Documentation to demonstrate that implementation of the measure is neither feasible nor appropriate to ensure efficient use of water and the prevention of waste and the supplier has used a suitable methodology in evaluating the measure;
- (5) The identification of resource issues under OAR 690-086-0140(5)(i) is accurate and complete;
- (6) The water curtailment element required under OAR 690-086-0160 satisfactorily promotes water curtailment practices and the coordination of usage regulation, taking into account state water law and local conditions, or is substantially the same as a curtailment plan prepared pursuant to ORS 536.780 and OAR 690-019-0090 and approved by the Department within the previous five years;
- (7) If during the next 20 years the maximum rate of water diverted under an extended permit will be greater than the maximum rate authorized for diversion under the extension or previously approved water management and conservation plan;
 - (a) The plan includes a schedule for development of any conservation measures that would provide water at a cost that is equal to or lower than the cost of other identified sources, unless the supplier has provided sufficient justification for the factors used in selecting other sources for development or the supplier serves a population of less than 1,000;
 - (b) Increased use from the source is the most feasible and appropriate water supply alternative available to the supplier; and
 - (c) If mitigation is legally required to address limitations or restrictions on the development of permits for which resource issues are identified under OAR 690-086-0140(5)(i), the plan contains documentation that the supplier is complying with the mitigation requirements. The Department may consult with federal and state agencies in making this determination; and
- (8) After January 1, 2042, for review of water management and conservation plans that propose to increase the maximum rate of water diverted under an extended permit that the additional diversion of water will not impair or be detrimental to the public interest.

Stat. Auth.: ORS 536.027, ORS 537.211 & ORS 540.572
Stats. Implemented: ORS 537.230, ORS 537.630 & ORS 539.010
Hist.: WRD 4 2002, f. & cert. ef. 11-1-02

690-086-0140

Municipal Water Supplier Description

The water supplier description element shall include at least the following information:

- (1) A description of the supplier's source(s) of water; including diversion, storage and regulation facilities; exchange agreements; intergovernmental cooperation agreements; and water supply or delivery contracts;
- (2) A delineation of the current service areas and an estimate of the population served and a description of the methodology(ies) used to make the estimate;
- (3) An assessment of the adequacy and reliability of the existing water supply considering potential limitations on continued or expanded use under existing water rights resulting from existing and potential future restrictions on the community's water supply;
- (4) A quantification of the water delivered by the water supplier that identifies current and available historic average annual water use, peak seasonal use, and average and peak day use;
- (5) A tabular list of water rights held by the municipal water supplier that includes the following information:
 - (a) Application, permit, transfer, and certificate numbers (as applicable);
 - (b) Priority date(s);
 - (c) Source(s) of water;
 - (d) Type(s) of beneficial uses specified in the right;

- (e) Maximum instantaneous and annual quantity of water allowed under each right;
 - (f) Maximum instantaneous and annual quantity of water diverted under each right to date;
 - (g) Average monthly and daily diversions under each right for the previous year, and if available for the previous five years;
 - (h) Currently authorized date for completion of development under each right; and
 - (i) Identification of any streamflow-dependent species listed by a state or federal agency as sensitive, threatened or endangered that are present in the source, any listing of the source as water quality limited and the water quality parameters for which the source was listed, and any designation of the source as being in a critical ground water area.
- (6) A description of customers served including other water suppliers and the estimated numbers; general water use characteristics of residences, commercial and industrial facilities, and any other uses; and a comparison of the quantities of water used in each sector with the quantities reported in the water supplier's previously submitted water management and conservation plan and progress reports;
- (7) Identification and description of interconnections with other municipal supply systems;
- (8) A schematic of the system that shows the sources of water, storage facilities, treatment facilities, major transmission and distribution lines, pump stations, interconnections with other municipal supply systems, and the existing and planned future service area; and
- (9) A quantification and description of system leakage that includes any available information regarding the locations of significant losses.

Stat. Auth.: ORS 536.027, ORS 537.211 & ORS 540.572
Stats. Implemented: ORS 537.230, ORS 537.630 & ORS 539.010
Hist.: WRD 11-1994, f. & cert. ef. 9-21-94; WRD 4 2002, f. & cert. ef. 11-1-02

690-086-0150

Municipal Water Conservation Element

The water conservation element shall include at least the following:

- (1) A progress report on the conservation measures scheduled for implementation in a water management and conservation plan previously approved by the Department, if any;
- (2) A description of the water supplier's water use measurement and reporting program and a statement that the program complies with the measurement standards in OAR chapter 690, division 85, that a time extension or waiver has been granted, or that the standards are not applicable;
- (3) A description of other conservation measures, if any, currently implemented by the water supplier, including any measures required under water supply contracts;
- (4) A description of the specific activities, along with a schedule that establishes five-year benchmarks, for implementation of each of the following conservation measures that are required of all municipal water suppliers:
 - (a) An annual water audit that includes a systematic and documented methodology for estimating any un-metered authorized and unauthorized uses;
 - (b) If the system is not fully metered, a program to install meters on all un-metered water service connections. The program shall start immediately after the plan is approved and shall identify the number of meters to be installed each year with full metering completed within five years of approval of the water management and conservation plan;
 - (c) A meter testing and maintenance program;
 - (d) A rate structure under which customers' bills are based, at least in part, on the quantity of water metered at the service connections;

(e) If the annual water audit indicates that system leakage exceeds 10 percent, a regularly scheduled and systematic program to detect leaks in the transmission and distribution system using methods and technology appropriate to the size and capabilities of the municipal water supplier; and

(f) A public education program to encourage efficient water use and the use of low water use landscaping that includes regular communication of the supplier's water conservation activities and schedule to customers;

(5) If the municipal water supplier proposes to expand or initiate diversion of water under an extended permit for which resource issues have been identified under OAR 690-086-0140(5)(i), a description of the specific activities, along with a schedule that establishes five-year benchmarks, for implementation of a system-wide leak repair or line replacement program to reduce system leakage to no more than 15 percent or sufficient information to demonstrate that system leakage currently is no more than 15 percent.

(6) If the municipal water supplier serves a population greater than 1,000 and proposes to expand or initiate diversion of water under an extended permit for which resource issues have been identified under OAR 690-086-0140(5)(i), or if the municipal water supplier serves a population greater than 7,500, a description of the specific activities, along with a schedule that establishes five-year benchmarks, for implementation of each of the following measures; or documentation showing that implementation of the measures is neither feasible nor appropriate for ensuring the efficient use of water and the prevention of waste:

(a) A system-wide leak repair program or line replacement to reduce system leakage to 15 percent, and if the reduction of system leakage to 15 percent is found to be feasible and appropriate, to reduce system leakage to 10 percent;

(b) Technical and financial assistance programs to encourage and aid residential, commercial and industrial customers in implementation of conservation measures;

(c) Supplier financed retrofitting or replacement of existing inefficient water using fixtures, including distribution of residential conservation kits and rebates for customer investments in water conservation;

(d) Adoption of rate structures, billing schedules, and other associated programs that support and encourage water conservation;

(e) Water reuse, recycling, and non-potable water opportunities; and

(f) Any other conservation measures identified by the water supplier that would improve water use efficiency.

Stat. Auth.: ORS 536.027, ORS 537.211 & ORS 540.572

Stats. Implemented: ORS 537.230, ORS 537.630 & ORS 539.010

Hist.: WRD 11-1994, f. & cert. ef. 9-21-94; WRD 4 2002, f. & cert. ef. 11-1-02, Renumbered from 690-086-0140(2)

690-086-0160

Municipal Water Curtailment Element

The water curtailment element shall include at least the following:

(1) A description of the type, frequency and magnitude of supply deficiencies within the past 10 years and current capacity limitation. The description shall include an assessment of the ability of the water supplier to maintain delivery during long-term drought or other source shortages caused by a natural disaster, source contamination, legal restrictions on water use, or other circumstances;

(2) A list of three or more stages of alert for potential shortage or water service difficulties. The stages shall range from a potential or mild alert, increasing through a serious situation to a critical emergency;

(3) A description of pre-determined levels of severity of shortage or water service difficulties that will trigger the curtailment actions under each stage of alert to provide the greatest assurance of maintaining potable supplies for human consumption; and

(4) A list of specific standby water use curtailment actions for each stage of alert ranging from notice to the public of a potential alert, increasing through limiting nonessential water use, to rationing and/or loss of service at the critical alert stage.

Stat. Auth.: ORS 536.027, ORS 537.211 & ORS 540.572

Stats. Implemented: ORS 537.230, ORS 537.630 & ORS 539.010

Hist.: WRD 11-1994, f. & cert. ef. 9-21-94; WRD 4 2002, f. & cert. ef. 11-1-02, Renumbered from 690-086-0140(3)

690-086-0170

Municipal Water Supply Element

The water supply element shall include at least the following:

(1) A delineation of the current and future service areas consistent with state land use law that includes available data on population projections and anticipated development consistent with relevant acknowledged comprehensive land use plans and urban service agreements or other relevant growth projections;

(2) An estimated schedule that identifies when the water supplier expects to fully exercise each of the water rights and water use permits currently held by the supplier;

(3) Based on the information provided in section (1) of this rule, an estimate of the water supplier's water demand projections for 10 and 20 years, and at the option of the municipal water supplier, longer periods;

(4) A comparison of the projected water needs and the sources of water currently available to the municipal water supplier and to any other suppliers to be served considering the reliability of existing sources;

(5) If any expansion or initial diversion of water allocated under existing permits is necessary to meet the needs shown in section (3) of this rule, an analysis of alternative sources of water that considers availability, reliability, feasibility and likely environmental impacts. The analysis shall consider the extent to which the projected water needs can be satisfied through:

(a) Implementation of conservation measures identified under OAR 690-086-0150;

(b) Interconnection with other municipal supply systems and cooperative regional water management; and

(c) Any other conservation measures that would provide water at a cost that is equal to or lower than the cost of other identified sources.

(6) If any expansion or initial diversion of water allocated under existing permits is necessary to meet the needs shown in section (3) of this rule, a quantification of the maximum rate and monthly volume of water to be diverted under each of the permits;

(7) For any expansion or initial diversion of water under existing permits, a description of mitigation actions the water supplier is taking to comply with legal requirements including but not limited to the Endangered Species Act, Clean Water Act, Safe Drinking Water Act; and

(8) If acquisition of new water rights will be necessary within the next 20 years to meet the needs shown in section (3) of this rule, an analysis of alternative sources of the additional water that considers availability, reliability, feasibility and likely environmental impacts and a schedule for development of the new sources of water. The analysis shall consider the extent to which the need for new water rights can be eliminated through:

(a) Implementation of conservation measures identified under OAR 690-086-0150;

(b) Interconnection with other municipal supply systems and cooperative regional water management; and

(c) Any other conservation measures that would provide water at a cost that is equal to or lower than the cost of other identified sources.

Stat. Auth.: ORS 536.027, ORS 537.211 & ORS 540.572

Stats. Implemented: ORS 537.230, ORS 537.630 & ORS 539.010

Hist.: WRD 11-1994, f. & cert. ef. 9-21-94; WRD 4 2002, f. & cert. ef. 11-1-02, Renumbered from 690-086-0140(4)

**Agricultural Water Supplier Water Management
and Conservation Plans**

690-086-0210 [Renumbered to 690-086-0040]

690-086-0220

General Provisions

- (1) Certain agricultural water suppliers must have approved conservation plans to transfer water rights within the boundaries of the districts to other land within the districts (ORS 540.572 to 540.578). These rules provide the standards for those conservation plans.
- (2) Each agricultural water supplier required to submit a water management and conservation plan shall exercise diligence in implementing the approved plan and shall update and resubmit a plan consistent with the requirements of OAR 690, division 86 as prescribed during plan approval.
- (3) Any agricultural water supplier participating in the water transfer provisions in ORS 540.572 to 540.578 and OAR 690-021-0070 to 690-021-0700 shall submit an annual report describing progress-to-date in implementing a water management and conservation plan.
- (4) Water management and conservation plans submitted by agricultural water suppliers shall meet the requirements listed in OAR 690-086-0225 to 690-086-0270.
- (5) A water conservation plan prepared in accordance with criteria of the Bureau of Reclamation and substantially meeting the requirements of OAR 690-086-0225 to 690-086-0270 may be submitted to meet the requirements of these rules.
- (6) At least 30 days prior to submitting a draft plan to the Department, an agricultural water supplier shall make the draft plan available for review by each affected local government.
- (7) Each agricultural water supplier preparing a water management and conservation plan is encouraged to develop and implement a program to involve the supplier's patrons in the preparation of the plan. Recommendations include making the plan available for public inspection and conducting public meetings to provide information and gather input on the plan.

Stat. Auth.: ORS 536.027, ORS 537.211 & ORS 540.572
Stats. Implemented: ORS 537.230, ORS 537.630 & ORS 539.010
Hist.: WRD 11-1994, f. & cert. ef. 9-21-94; WRD 4 2002, f. & cert. ef. 11-1-02

690-086-0225

Agricultural Water Supplier Plan Elements

A water management and conservation plan submitted by an agricultural water supplier shall include:

- (1) An agricultural water supplier description as described under OAR 690-086-0240;
- (2) An agricultural water conservation element as described under OAR 690-086-0250;
- (3) An agricultural water allocation/curtailment element as described under OAR 690-086-0260;
- (4) An agricultural water supply element as required under OAR 690-086-0270;
- (5) A list of the affected local governments to whom the draft plan was made available pursuant to OAR 690-086-0220(6) and a copy of any comments on the plan provided by the local governments;
- (6) A proposed date for submittal of an updated plan based on the proposed schedule for implementation of conservation measures, any relevant schedules for other community planning activities, and the rate of growth of or other changes expected by the water supplier; or an explanation of why submittal of an updated plan is unnecessary and should not be required by the Department.

Stat. Auth.: ORS 536.027, 537.211 and 540.572
Stats. Implemented: ORS 537.230, ORS 537.630 & ORS 539.010
Hist.: WRD 4 2002, f. & cert. ef. 11-1-02

690-086-0240

Agricultural Water System Description

The description of the water system shall include at least the following information:

- (1) General location of water right acreage, numbers of the associated water right certificates and permits and a description of relevant conditions of the water rights including the seasons of use and the uses of any other permitted withdrawals by the supplier;
- (2) Source(s) of water; storage and regulation facilities; and a summary of any transfer, rotation, exchange or intergovernmental cooperation agreements;
- (3) A schematic of the system showing storage and distribution facilities, drainage systems, measurement stations, generalized district boundaries, points of diversion and locations of major operational spills;
- (4) Current water use, including peak and average annual diversions and, when available, water reuse and return flows;
- (5) A summary of major classifications of user accounts showing water right acreages, the number of accounts of each classification, and the beneficial uses for which water is provided (irrigation, frost protection, temperature control, agricultural use, livestock, domestic, etc.);
- (6) Types of on-farm irrigation systems common within the supplier's accounts;
- (7) A general characterization of crops commonly grown and the estimated average and peak consumptive use of the crops; and
- (8) A description of the operation and maintenance program.

Stat. Auth.: ORS 536.027, ORS 537.211 & ORS 540.572
Stats. Implemented: ORS 537.230, ORS 537.630 & ORS 539.010
Hist.: WRD 11-1994, f. & cert. ef. 9-21-94; WRD 4 2002, f. & cert. ef. 11-1-02

690-086-0250

Agricultural Water Conservation Element

The water conservation element shall include at least the following:

- (1) A progress report on the conservation measures scheduled for implementation in the water management and conservation plan previously approved by the Department, if any;
- (2) A description of the water supplier's agricultural water measurement program and a statement that the program complies with the measurement and reporting standards in OAR chapter 690, division 85, that a time extension or waiver has been granted, or that the standards are not applicable;
- (3) A description of other conservation measures currently implemented by the water supplier;
- (4) Short- and long-term goals of the water supplier to improve water management;
- (5) An evaluation of the opportunities for improving water use efficiency which includes:
 - (a) A description of losses of water from canals, pipelines, and laterals, including any operational spills;
 - (b) An assessment of the extent to which water deliveries are insufficient to meet crop needs;
 - (c) A list of alternative conservation measures to reduce the losses of water identified in subsection (a) of this section and address any insufficiencies of water deliveries identified in subsection (b) of this section; and
 - (d) An assessment of existing and future alternatives to finance conservation measures including an analysis of the possibility of applying for the allocation of conserved water (OAR 690-018-0010 to 690-018-0090).
- (6) For each of the following conservation measures not currently being implemented, and evaluation of whether implementation of the measure is feasible and appropriate for ensuring the efficient use of water and the prevention of waste:

- (a) Promotion of energy audits offered through local electric utilities for district water users;
 - (b) Conversion to metered, pressurized deliveries to all parcels of one acre or less;
 - (c) Piping or lining earthen canals;
 - (d) Modifying distribution facilities and district policies to increase the flexibility of water deliveries;
 - (e) Provision of on-farm irrigation scheduling assistance;
 - (f) Construction of re-regulating reservoirs;
 - (g) Adoption of rate structures that support and encourage water conservation;
 - (h) Each of the conservation measures listed in OAR 690-086-0250(5)(c); and
 - (i) Any other conservation measures identified by the water supplier that would improve water use efficiency.
- (7) A description and estimated schedule for implementation of each of the following conservation measures:
- (a) An information and education program aimed at improving the efficiency of use of water delivered. The program should address all types of uses served and include voluntary water use audits; and
 - (b) Any other conservation measures identified as feasible and appropriate under section (6) of this rule.
- (8) A program to monitor and evaluate the effectiveness of the conservation measures which are implemented.

Stat. Auth.: ORS 536.027, ORS 537.211 & ORS 540.572
Stats. Implemented: ORS 537.230, ORS 537.630 & ORS 539.010
Hist.: WRD 11-1994, f. & cert. ef. 9-21-94; WRD 4 2002, f. & cert. ef. 11-1-02, Renumbered from 690-086-0240(2)

690-086-0260

Agricultural Water Allocation/Curtailment Element

The water allocation/curtailment element shall include at least the following:

- (1) A description of the frequency and magnitude of past supply deficiencies and current capacity limitation. The description shall include an assessment of the ability of the water supplier to maintain delivery during drought or other source shortages.
- (2) A description of the water supply situation(s) that cause the water allocation/curtailment element to be implemented, including identification of the supply situations which trigger warnings to users or public notice of impending shortage;
- (3) A description of the procedure used to allocate water during water shortages.

Stat. Auth.: ORS 536.027, ORS 537.211 & ORS 540.572
Stats. Implemented: ORS 537.230, ORS 537.630 & ORS 539.010
Hist.: WRD 11-1994, f. & cert. ef. 9-21-94; WRD 4 2002, f. & cert. ef. 11-1-02, Renumbered from 690-086-0240(3)

690-086-0270

Agricultural Water Supply Element

The long-range water supply element shall include at least the following:

- (1) An estimate of the water supplier's long-range water demand projections for 20 years;

- (2) A comparison of the projected water needs and the size and reliability of water rights permits or other current water supply contracts held by the water supplier;
- (3) A list of potential sources of water, including conservation and reuse, to supply the long-range needs;
- (4) A comparison among the potential sources of additional water considering costs, availability, reliability, and likely environmental impacts;
- (5) An evaluation of the effects of the following factors on long-range water needs:
 - (a) Regional options for meeting future water needs;
 - (b) Urbanization and other land-use trends;
 - (c) Provisions in affected local governments' comprehensive plans relating to agricultural lands, urbanization, water resources, water supply, public facilities and services, and any other pertinent plan element or ordinance relating to uses or lands served, or proposed to be served, under the long-term water supply plan.

Stat. Auth.: ORS 536.027, ORS 537.211 & ORS 540.572
Stats. Implemented: ORS 537.230, ORS 537.630 & ORS 539.010
Hist.: WRD 11-1994, f. & cert. ef. 9-21-94; WRD 4 2002, f. & cert. ef. 11-1-02, Renumbered from 690-086-0240(4)

Water Management and Conservation Plan Review and Enforcement

690-086-0900

Water Management and Conservation Plan Review, Approval and Enforcement

- (1) The rules in OAR 690-086-0900 to 690-086-0920 set out the process and criteria for the Department's review, approval and enforcement of the water management and conservation plans submitted by agricultural and municipal water suppliers. The rules apply to the submittal and review of draft plans, proposed final plans, and subsequent updates.
- (2) During the plan review and approval process, the Department may allow additional time for a municipal water supplier to implement water metering under OAR 690-086-0150(4)(b) or a benchmark established in a previously approved plan if the water supplier shows that additional time is necessary to avoid unreasonable and excessive costs.
- (3) Notwithstanding any of the requirements of these rules, except OAR 690-086-0150(2) and 690-086-0250(2), the Department may approve a water management and conservation plan if the plan is generally consistent with the applicable criteria and includes a schedule for completion within five years of any additional work necessary to satisfy the requirements.
- (4) Any plan approval that contains a requirement that a municipal water supplier complete additional work under section (3) of this rule shall preclude additional diversion of water under an extended permit beyond the need quantified for the next two years.

Stat. Auth.: ORS 536.025 & ORS 536.027
Stats. Implemented: ORS 537.230, ORS 537.630 & ORS 539.010
Hist.: WRD 4 2002, f. & cert. ef. 11-1-02

690-086-0905

Notice of Submittal of a Draft Plan or Updated Plan

- (1) The Department shall notify affected local governments, affected Indian tribes, and all persons on the Department's weekly mailing list that a draft water management and conservation plan prepared under the requirements of OAR 690-086-0125 or 690-086-0225 has been submitted to the Department and is available for review.
- (2) Any person may review and submit written comments on the draft plan within 30 days of the notification in section (1) of this rule. Written comments submitted under this subsection must cite specific provisions of concern in the draft plan, describe how each of the provisions cited do or do not satisfy the requirements of OAR chapter 690, division 086, suggest any modification in each

provision that would be necessary to satisfy the relevant requirement, and include information to support any suggested modifications.

Stat. Auth.:ORS 536.027, ORS 537.211 & ORS 540.572

Stats. Implemented: ORS 537.230, ORS 537.630 & ORS 539.010

Hist.: WRD 11-1994, f. & cert. ef. 9-21-94; WRD 4 2002, f. & cert. ef. 11-1-02, Renumbered from 690-086-0910(1) & (2)

690-086-0910

Preliminary Review of Draft Plans

(1) The Department shall undertake a preliminary review of the draft plan and the comments received pursuant to OAR 690-086-0905 to determine whether the plan includes the required elements of 690-086-0120 to 690-086-0170 or 690-086-0220 to 690-086-0270.

(2) For a plan submitted by a municipal water supplier, the Department shall review the plan to determine if the information and analyses in the plan are sufficient for the Department to make the determination required under OAR 690-086-0130.

(3) For a plan submitted by an agricultural water supplier the Department shall review the plan to determine whether:

(a) The plan includes the information required in OAR 690-086-0240;

(b) The water supplier has complied with the requirements of OAR 690-086-0250 and has included a description of the actions to be taken in the implementation of water conservation measures that are feasible and appropriate for ensuring the efficient use of water and the prevention of waste; considering:

(A) The economic feasibility of the measures for the water supplier;

(B) Any likely adverse environmental impacts of implementation of the measures;

(C) Whether the measures are available and proven;

(D) The time needed to implement the measures;

(E) The effects of local variations in soil type and weather on the potential for successful implementation of the measures; and

(F) Whether the measures are consistent with other relevant water management plans and subbasin conservation plans.

(c) The water allocation/curtailment element prepared under OAR 690-086-0260 satisfactorily promotes water curtailment practices and the coordination of usage regulation, taking into account state water law and local conditions, or is substantially the same as a curtailment plan prepared pursuant to ORS 536.780 and OAR 690-019-0090 and approved by the Department within the previous five years; and

(d) The water supplier has included the information required in OAR 690-086-0270, and, in the list of potential sources of water to meet projected demands, included the development of any conservation measures which are available at a cost which is lower than the cost of other identified sources or has provided sufficient justification for the factors used in selecting other sources for development.

(4) Upon completion of the preliminary review and no later than 90 days after receipt of a draft plan, the Department shall:

(a) After considering public comments, provide the Department's written comments on the plan to the water supplier and any person who submitted comments pursuant to OAR 690-086-0905; or

(b) After considering public comments if the Department determines that the draft plan includes the required plan elements under OAR 690-086-0125 or 690-086-0225, and for municipal water supply plans, that the plan meets the criteria under 690-086-0130, issue a final order approving the plan pursuant to 690-0086-0915(4) or (5) and notify any person who submitted comments pursuant to 690-086-0905 of the issuance of the order.

(5) The Department shall include in its written comments prepared under section (4) of this rule:

- (a) For each deficiency identified in the review, a citation of the relevant statute or rule;
 - (b) To the extent possible, identification of any constraints to implementation of the water management and conservation plan and recommendations on appropriate actions to secure any identified new sources of water;
 - (c) An evaluation of the extent to which a request for additional time under OAR 690-086-0900(2) satisfies the relevant requirements of the rules;
 - (d) A prescribed reasonable period of time of not less than 60 days, identified in consultation with the water supplier, for the water supplier to respond to the Department's review and to submit a proposed final plan; and
 - (e) Copies of any written comments received pursuant to OAR 690-086-0905.
- (6) If the Department does not meet the 90-day deadline in section (4) of this rule:

- (a) For purposes of ORS 540.572, a plan submitted by an agricultural water supplier after November 1, 2002, is deemed approved for the period from the expiration of the 90-day deadline until 120 days after the Department provides written comments under section (5) of this rule; and
- (b) For municipal water suppliers whose additional diversion of water under an extended permit is only authorized upon issuance of a final order approving a water management and conservation plan, notwithstanding OAR chapter 690, division 315, the Director may by order authorize diversion of an additional specified quantity of water as necessary to prevent harm to public welfare, safety and health.

Stat. Auth.: ORS 536.027, ORS 537.211 & ORS 540.572
Stats. Implemented: ORS 537.230, ORS 537.630 & ORS 539.010
Hist.: WRD 11-1994, f. & cert. ef. 9-21-94; WRD 4 2002, f. & cert. ef. 11-1-02

690-086-0915

Final Review of Plans

- (1) Upon receipt of a proposed final plan, the Department shall evaluate the plan to determine if it includes the required elements of OAR 690-086-0125 to 690-086-0170 for municipal water suppliers or 690-086-0225 to 690-086-0270 for agricultural water suppliers. The evaluation shall be limited to a review of modifications in the plan and issues that were identified in the Department's written comments provided under 690-086-0910 and, if any deficiencies are identified, the Department's review shall cite the relevant statute or rule.
- (2) If the Department determines that the final plan does not include the required elements of OAR 690-086-0120 to 690-086-0170 or 690-086-0220 to 690-086-0270, the Department shall consult with the water supplier and may provide additional time to correct any discrepancies.
- (3) For a water management and conservation plan submitted by a municipal water supplier, the Department shall review the plan to determine if the information and analyses in the plan are sufficient for the Department to make the determination required under OAR 690-086-0130.
- (4) For a water management and conservation plan submitted by a municipal water supplier, if the Department determines that the proposed final plan includes the required elements under OAR 690-086-0120 to 690-086-0170 and meets the applicable criteria under 690-086-0130, the Department shall issue a final order approving the plan and notify the water supplier and any person who submitted comments pursuant to 690-086-0905 of the approval. The Department's order shall include the following:
 - (a) A quantification of the maximum amount of water to be diverted during the next 20 years under each extended permit, or for a longer period as specified for an extended reservoir permit;
 - (b) The date on which an updated plan shall be submitted to the Department. A municipal water supplier may submit an updated plan at any time prior to the date specified if necessary to accommodate unanticipated events, but the Department shall not require submittal of an updated plan earlier than five years after issuance of the order approving the plan; and
 - (c) A schedule for submittal of five-year progress reports on implementation of the water conservation and supply measures described in the plan.

(5) For a water management and conservation plan submitted by an agricultural water supplier, if the Department determines that the proposed final plan satisfies the relevant requirements or if the water supplier satisfactorily corrects any identified discrepancies, the Department shall issue a final order approving the plan and notify the water supplier and any person who submitted comments pursuant to OAR 690-086-0905 of the approval. The Department shall specify in the order approving the plan if an updated plan shall be required and, if so, the date on which the updated plan shall be submitted to the Department. The Department shall not require submittal of an updated plan earlier than five years after issuance of the order approving the plan.

(6) The Department shall issue a final order denying approval of the plan and notify the water supplier and any person who submitted comments pursuant to OAR 690-086-0905 of the issuance of the order if:

(a) The Department determines that the proposed final plan does not contain the plan elements required under OAR 690-086-0125 or 690-086-0225;

(b) For municipal water suppliers, the plan does not meet the criteria under OAR 690-086-0130;

(c) The municipal water supplier has failed to adequately justify a request for additional time to implement water metering under OAR 690-086-0150(4)(b) or a benchmark established in a previously approved plan; or

(d) The work plan submitted under OAR 690-086-0900(3) is insufficient for completing the additional work necessary to satisfy the requirements of these rules.

(7) The Department may deny approval of a water management and conservation plan if the water supplier fails to submit a final plan to the Department within 120 days after receipt of the Department's preliminary review.

(8) If the Department issues a final order denying approval of the plan, the water supplier may request that the Department reconsider the order and the Director appoint a five-member review board to review the plan. The board shall include at least two individuals from the basin in which the supplier is located who are engaged in similar uses of water, the local watermaster, and other individuals knowledgeable about water use practices and water conservation. After reviewing the plan and evaluating any additional information presented by the water supplier and the Department, the board may recommend that the Department:

(a) Reconsider the decision not to approve the plan;

(b) Reconsider the decision not to approve the plan contingent on the water supplier agreeing to specified modifications; or

(c) Reaffirm the original decision not to approve the plan.

(9) The Department shall notify the water supplier, the members of the review board, and any person who submitted comments pursuant to OAR 690-086-0905 of any action taken based on the board's recommendation.

(10) The water supplier or a person who has submitted comments pursuant to OAR 690-086-0905 may, within 30 days of a notification pursuant to OAR 690-086-0910(5)(b) or section (4), (5), (6), or (9) of this rule, appeal a decision by the Department to approve or to not approve a plan to the Commission. The Commission may deny the appeal or may accept the appeal and remand the plan to the Department to seek resolution of the issues identified in the appeal and, if the issues are not resolved, to initiate a contested case proceeding pursuant to ORS 183.413 and OAR chapter 690, divisions 1 and 2.

Stat. Auth.: ORS 536.027, ORS 537.211 & ORS 540.572

Stats. Implemented: ORS 537.230, ORS 537.630 & ORS 539.010

Hist.: WRD 11-1994, f. & cert. ef. 9-21-94; WRD 4 2002, f. & cert. ef. 11-1-02, Renumbered from 690-086-0910(7)

690-086-0920

Enforcement

If the Director determines that a water supplier has failed to submit a water management and conservation plan as required under OAR 690-086-0010 to 690-086-0270 or has failed to satisfactorily implement an approved water management and conservation plan, the Director may proceed with one or more of the following actions:

(1) Provide an additional, specified amount of time for remedy;

(2) Initiate an evaluation of the supplier's water management practices and facilities to determine if the use of water is wasteful;

- (3) Initiate regulation of water use under OAR 690-250-0050 to eliminate waste;
- (4) Rescind a previous approval of a water management and conservation plan; and
- (5) If the submittal of the water management and conservation plan is required under a condition of a permit or an extension approved under OAR chapter 690, division 315 or 320, assess a civil penalty under OAR 690-260-0005 to 690-260-0110 or cancel the permit.

Stat. Auth.: ORS 536.027, ORS 537.211 & ORS 540.572
Stats. Implemented: ORS 537.230, ORS 537.630 & ORS 539.010
Hist.: WRD 11-1994, f. & cert. ef. 9-21-94; WRD 11-1994, f. & cert. ef. 9-21-94