MASON COUNTY PUD NO. 1

MASON COUNTY **WASHINGTON**

WONDERLAND WATER SYSTEM PLAN

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G&O #25203
SEPTEMBER 2025

Gray & Osborne, Inc.
CONSULTING ENGINEERS

TABLE OF CONTENTS

CHAPTER 1 – WATER SYSTEM DESCRIPTION

CHAPTER 2 – BASIC PLANNING DATA

CHAPTER 3 – SYSTEM ANALYSIS

CHAPTER 4 – WATER USE EFFICIENCY PROGRAM

CHAPTER 5 – SOURCE WATER PROTECTION

LIST OF TABLES

LIST OF FIGURES

APPENDICES

CHAPTER 1

WATER SYSTEM DESCRIPTION

INTRODUCTION

The Wonderland Water System is a Group A water system with the Washington State Department of Health (DOH) public water system ID number 98128K. The water system is owned and operated by Mason County Public Utility District No. 1 (PUD). The last planning effort undertaken for the Wonderland Water System was the 2008 Small Water System Management Plan which was completed prior to the acquisition of the Wonderland Water System by Mason County PUD 1.

This Water System Plan (WSP or Plan) will assess the current and future capabilities of the Wonderland water system, recommend improvements to allow the system to provide water service throughout the planning period, and meet the statutory requirements of WAC 246-290-100 WAC, Chapter 246-293-250 WAC, and Chapter 246-295 WAC.

The PUD owns and operates over 70 water systems. To manage these systems, the PUD categorizes its Water System Plans into two components: Part A and Part B. Part A addresses Owner-specific considerations that apply to all PUD-owned water systems, while Part B is tailored to the unique needs of each individual water system. This document is designed to fulfill the Part B requirements for the Wonderland Water System.

This Plan, in conjunction with the PUD's 2019 WSP Part A, is designed to fulfill all Water System Planning requirements while addressing the needs and priorities of the PUD. It is subject to review by the Mason County Planning Department, the Washington State Department of Health (DOH), and the Washington State Department of Ecology (Ecology). In accordance with state water regulations, this Plan must be approved by DOH and formally adopted by the PUD.

OBJECTIVE

This objective of this chapter is to present background information for the Wonderland Water System and will include the following:

- Ownership and Management;
- System Background;
- Existing System;
- Related Planning Documents;
- Service Area Characteristics.

OWNERSHIP AND MANAGEMENT

MANAGEMENT STRUCTURE AND DECISION-MAKING PROCEDURES

Mason County Public Utility District No. 1 is a publicly owned utility district formed as a municipal corporation utility under Chapter 54 of the Revised Code of Washington (RCW).

The PUD is governed by a Board of Commissioners which appoints a General Manager who is responsible for the day-to-day operations.

The Water Resources Manager works for the General Manager and is responsible for the maintenance and operation of the various water systems that the PUD owns and operates.

The Water Department personnel work directly for the Water Resources Manager. Currently, the Board of Commissioners are Jack Janda (District 3), Ron Gold (District 2), and Mike Sheetz (District 1).

The Board of Commissioners serve 6-year terms with elections for one position every 2 years.

The Board of Commissioners meet twice monthly on the second and fourth Tuesday to discuss financial matters, system improvements, and other issues necessary to the operation of the utility.

The PUD General Manager is Kristin Masteller.

The Water Resources Manager is Brandy Milroy.

The Engineering Manager is Jeremiah Waugh.

Ms. Masteller, Ms. Milroy, and Mr. Waugh work together to advise the Board of Commissioners, and to carry out the Commissioners' directives.

WATER FACILITIES INVENTORY FORM

A copy of the Wonderland Water System 2025 Water Facilities Inventory (WFI) form is included in Appendix A. The 2025 WFI indicates 34 active full-time single-family residential connections. DOH previously approved the system for 42 connections.

CONTACTING MASON COUNTY PUD NO. 1

Mason County PUD No. 1's current mailing address and telephone number is:

Mason County PUD No. 1
21971 North Highway 101
Shelton, Washington 98584
Phone: (360) 877-5249

In addition, the Water Resources Manager can be contacted by email at the following:

brandym@mason-pud1.org

SYSTEM BACKGROUND

The Wonderland Water System is located in Mason County, Washington, approximately 8.5 miles northeast of Shelton, near Spencer Lake.

The system serves properties located near Highway 3, off East Pickering Road, on East Queen Way, East Majesty Court, and East Kings Way. The existing service area encompasses all properties within the NE/SW of Section 29, Township 21N, Range 2W of Mason County. Figure 1-1 shows the system and the surrounding area.

HISTORY OF SYSTEM DEVELOPMENT AND GROWTH

The Wonderland Water System was approved and completed on May 10, 1973. It consists of two divisions: Division One, approved in 1973 for 21 lots, and Division Two, approved on April 11, 1977, for 13 lots. The DOH has previously approved the system to serve 42 connections.

The system was previously owned and operated by H&R Waterworks, Inc. (HRWW). Mason County PUD 1 took over ownership and operation of the Wonderland Water System in July 2018.

The system currently consists of a single pressure zone served by one well with a capacity of 100 gallons per minute.

The Wonderland Water System Retail Service Area (RSA) is shown in Figure 1-2.

ADJACENT PURVEYORS

The Wicked Delights Bakery Water System is a Group B water system with the DOH ID 45286V. The water system is currently co-owned and operated by J&M Leasing LLC and Christina K. Samione. Mason County PUD 1 intends to consolidate with the Wicked Delights Bakery Water System as part of this planning effort. The Wicked Delights

Bakery Water System is requesting consolidation with the Wonderland Water System as its sole well has become unreliable. The most recent WFI form for the Wicked Delights Bakery Water System is included in Appendix A. Figure 1-2 shows adjacent purveyors including the Wicked Delights Bakery Water System.

The Wicked Delights Bakery Water System well consists of a 6-inch casing, drilled to a depth of 195 feet, and had a 37 gallon per minute (gpm) capacity.

INVENTORY OF EXISITING FACILITIES

The following sections provide descriptions and pertinent details of the Wonderland Water System. A map of the water system facilities is provided in Figure 1-3.

SOURCE OF SUPPLY

Well 1

The Wonderland Water System is supplied by a single well (Well 1 AHB625) which was drilled in 1973. A well log is included in Appendix B. The well is equipped with two 5-horsepower, 3-phase submersible pumps that were installed in 1995. These same well pumps and motors failed in 2000 and were replaced in-kind by HRWW. These pumps each have a 48 gpm capacity and operate with different pressure setpoints. The first well pump is called "on" at 35 psi and called "off" at 55 psi. While the second well pump is called "on" at 36 psi and called "off" at 62 psi. Additional design criteria for the well is summarized in Table 1-1.

In 2020 the well house was rebuilt and two 300-gallon captive air tanks were removed and replaced with eight 119-gallon bladder tanks and a new source meter was installed.

TABLE 1-1

Well 1 Characteristics

Well No.	DOH Source No	Tag ID	Year Drilled	Total Depth (ft bgs)(1)	Slot Size	Screened Interval (ft)	Well Capacity (gpm)
1	S01	AHB625	1973	230	80	212-217	96
Well Pumps							
Pump			**Power (hp)**	**Phase**		**Voltage**	**Flow Rate (gpm)**
Submersible Pump			5	3		240	48
Submersible Pump			5	3		240	48

(1) Appendix B Wonderland Well Report reports a depth of 217 feet, whereas Department of Health reports 230 feet. For consistency a depth of 230 feet is reported.

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WONDERLAND WATER SYSTEM PLAN

FIGURE 1-1

VICINITY MAP

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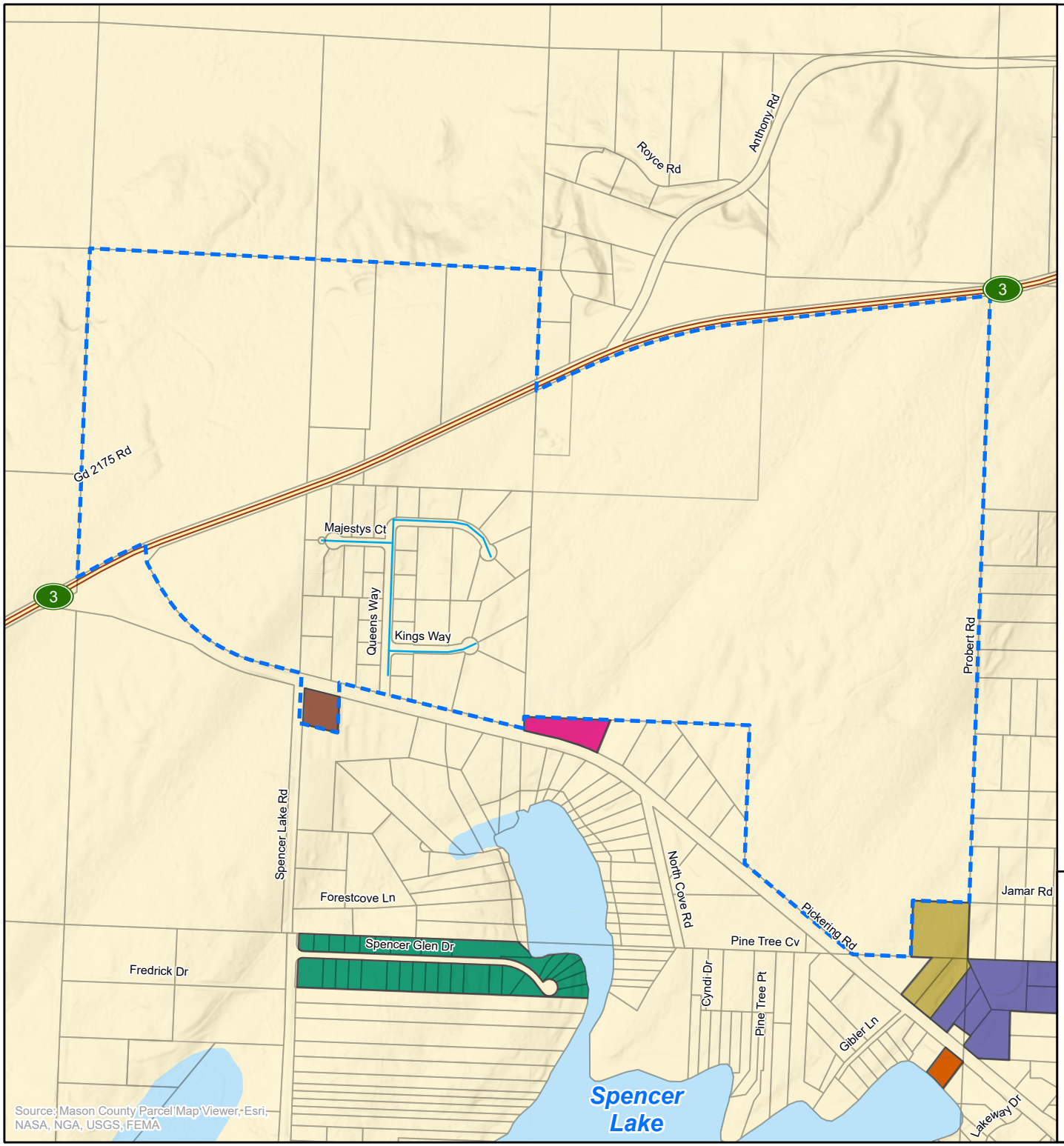

Purveyor (Group A)
- Spencer Glen
- Spencer Lake Bar and Grill
- Spencer Lake RV Park
- VIG

Purveyor (Group B)
- Pickering Spencer Lake
- Wicked Delights Bakery

Reference
- Waterline
- Highway
- Water Service Area, Retail Service Area, and Water Rights Place of Use
- Parcel
- Surface Water

N

0 500 1,000 Feet

MASON COUNTY PUD 1

WONDERLAND WATER SYSTEM PLAN

FIGURE 1-2

ADJACENT PURVEYORS

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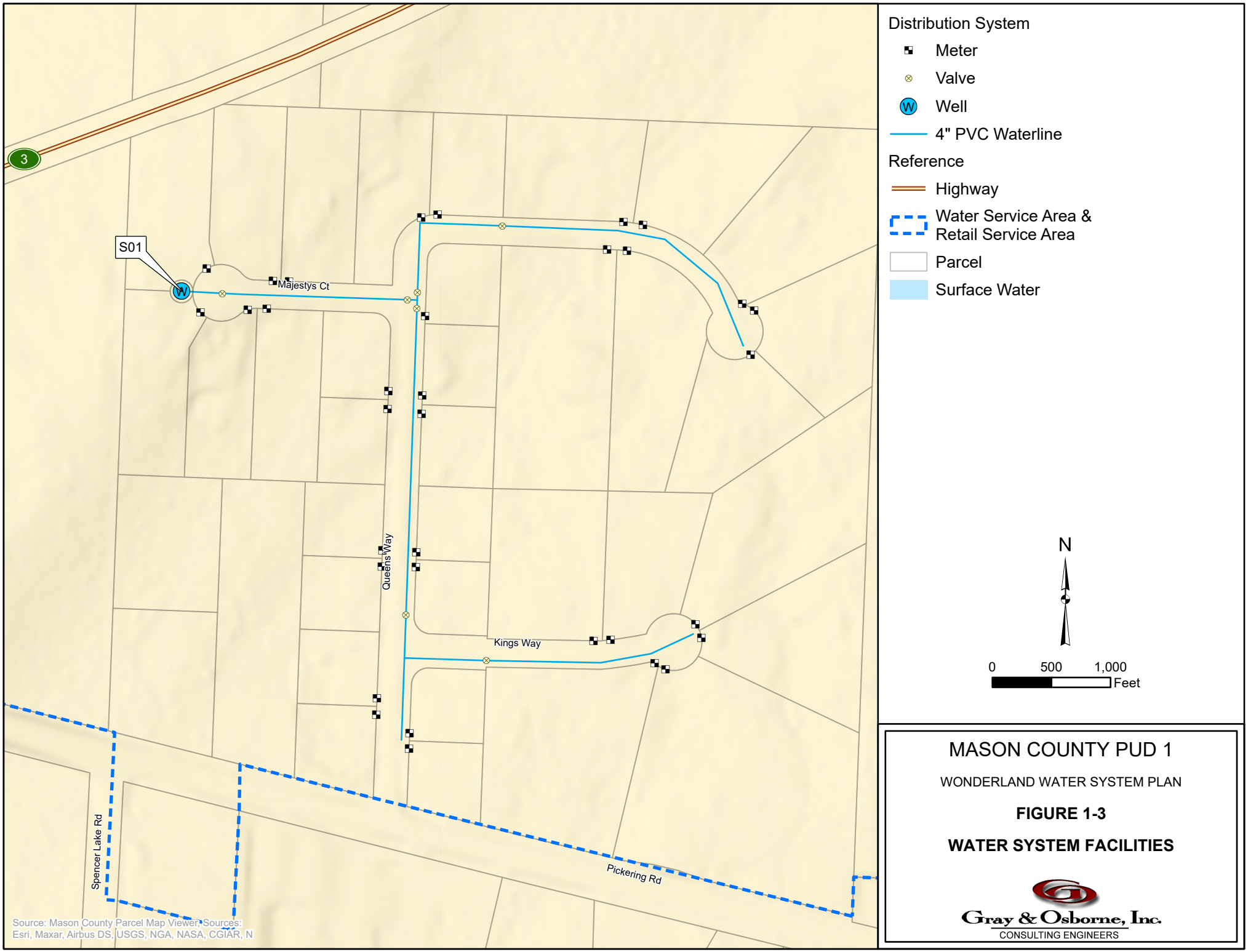

MASON COUNTY PUD 1

WONDERLAND WATER SYSTEM PLAN

FIGURE 1-3

WATER SYSTEM FACILITIES

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WATER RIGHTS

The Wonderland Water System holds one water rights certificate, Ground Water Certificate G2-20470C, with a priority date of February 6, 1973. This certificate authorizes an instantaneous withdrawal of up to 100 gpm and a maximum annual withdrawal of 120 acre-feet (ac-ft) per year for community domestic supply.

The Certificate of Water Right is provided in Appendix C, with a summary of the Wonderland Water System's water rights presented in Table 1-2.

TABLE 1-2

Wonderland Water System Water Rights

Right Number	Point of Withdrawal	Instantaneous Qi (gpm)	Annual Qa (ac-ft/yr)	Purpose
G2-20470C	Well 1 AHB625	100	120	Community Domestic

TREATMENT

This water system does not provide treatment, as water quality results have consistently remained within the maximum contaminant levels (MCL) for bacterial and chemical contaminants. The system complies with monitoring and water quality requirements outlined in WAC 246-240-300. However, iron and manganese levels are approaching their respective MCLs, further discussion of water quality can be found within Chapter 3.

WATER STORAGE

This system does not have storage facilities. The system operates as a closed zone and is pressurized with the well pumps and bladder tanks.

DISTRIBUTION SYSTEM

The water distribution system consists of approximately 2,430 feet of 4-inch polyvinyl chloride (PVC) pipe. There are seven valves in the system and 34 service meters which are shown in Figure 1-3.

INTERTIES

The Wonderland Water System does not have any interties to the adjacent water systems.

SATELLITE MANAGEMENT AGENCY

Mason County PUD 1 owns and manages this water system. It is a DOH-approved Satellite Management Agency (SMA), License #111.

RELATED PLANNING DOCUMENTS

The following planning documents contain information that is related and/or applicable to this Water System Plan:

MASON COUNTY COMPREHENSIVE PLAN, DEPARTMENT OF COMMUNITY DEVELOPMENT, APRIL 2016 (REVISED 2017)

The Comprehensive Plan addresses how best to respond to the needs and demands of anticipated growth. It looks ahead to the year 2036 and sets policies for County investments in roads, water, sewer, parks, and other public facilities. The Plan guides development and land use regulations, which were created to manage private growth and ensure that resource lands, and the environment were protected. The elements of the Comprehensive Plan include land use and rural lands, housing, capital facilities, utilities, and transportation.

PUBLIC UTILITY DISTRICT NO. 1 OF MASON COUNTY COMPREHENSIVE WATER SYSTEM PLAN PART A, DECEMBER 2019

This document describes the Mason County Public Utility District No. 1 and a brief overview of all 70 water systems under its management. In addition, the Plan discusses in general terms, system analysis, conservation and source of supply, source water protection, operation and maintenance, distribution facilities design and construction standards, an improvement program, and a financial program.

PUBLIC UTILITY DISTRICT NO. 1 OF MASON COUNTY WATER POLICY MANUAL, OCTOBER 2020

This Manual outlines the policies and procedures to be applied by District staff in providing utility service to individual properties served by the District. The policies guide how the District will manage extensions, make improvement to the District's water systems, and provide service to satellite utility systems owned or operated by the District.

WRIA 14 – KENNEDY-GOLDSBOROUGH WATERSHED PLAN, DECEMBER 2024

The purpose of the Water Resource Inventory Area (WRIA) 14 Watershed Restoration and Enhancement Plan (watershed plan) is to identify the projects and actions necessary to "offset potential impacts to instream flows associated with permit-exempt domestic water use" and "result in a net ecological benefit (NEB) to instream resources within the [WRIA]." This plan achieves these purposes consistent with the requirements of RCW 90.94.030, the Streamflow Restoration Policy and Interpretive and Ecology's Final Guidance on Determining Net Ecological Benefit. This plan considers all available information including priorities for salmon recovery and watershed recovery and the draft

materials prepared by the WRIA 14 Watershed Restoration and Enhancement Committee.

SERVICE AREA CHARACTERISTICS

The Wonderland Water System boundary encompasses an area of approximately 318 acres. The Wonderland Water System service area and retail service area (RSA) are shown in Figure 1-2. With this Plan, the PUD intends to expand the RSA to connect and consolidate with the Wicked Delights Bakery Water System.

LAND USE AND ZONING

According to the Mason County Development Areas Map, the Wonderland Water System is classified as a Rural Residence 5 (RR5) zone. The Wicked Delights Bakery is zoned as Rural Commercial 2 (RC2). Refer to Section 17.04.222 of the Mason County Code for further information regarding RR5 Zoning classifications. The system zoning is indicated on Figure 1-4.

GEOGRAPHY

Elevations range from approximately 211 feet to 240 feet above sea level.

Well 1 is located at an elevation of approximately 240 feet.

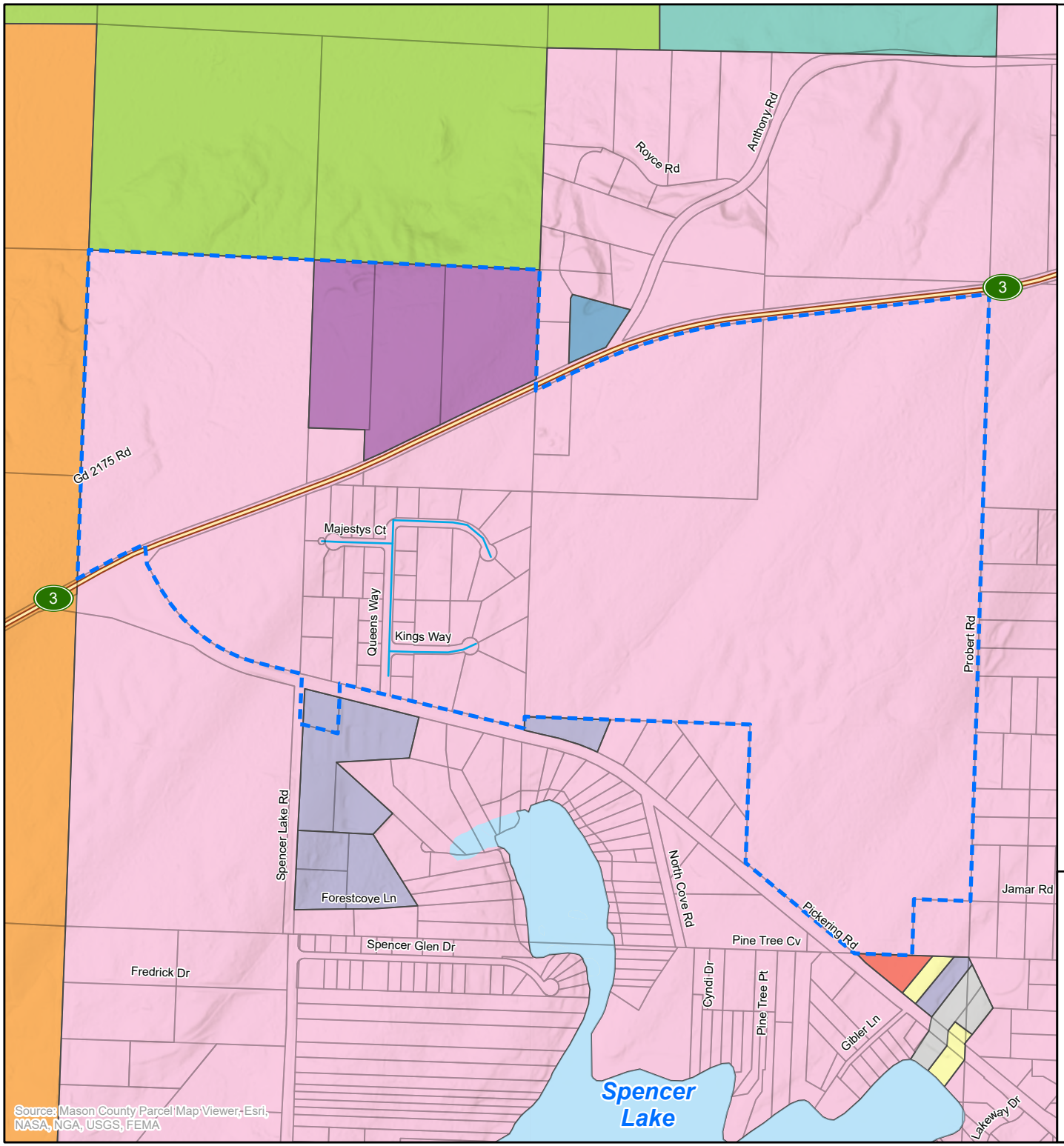
The topography of the system is shown on Figure 1-5.

CRITICAL AREAS

Figure 1-6 shows the critical areas for the Wonderland Water System Service Area based on Mason County GIS data. There do not appear to be any critical areas mapped in the Wonderland service area.

WATER SYSTEM POLICIES

The PUD Water System Policies are addressed in the Mason County PUD No. 1 Water System Plan Part A.



Zone

- AGR - Agricultural Resource Lands
- RC1 - Rural Commercial 1
- RC2 - Rural Commercial 2
- RC3 - Rural Commercial 3
- RI - Rural Industrial
- RR10 - Rural Residential 10 Acres
- RR20 - Rural Residential 20 Acres
- RR5 - Rural Residential 5 Acres
- RT - Rural Tourist
- RTC - Rural Tourist-Campground

Reference

- Waterline
- Highway
- Water Service Area & Retail Service Area
- Parcel
- Surface Water

N

0 500 1,000 Feet

MASON COUNTY PUD 1

WONDERLAND WATER SYSTEM PLAN

FIGURE 1-4

ZONING

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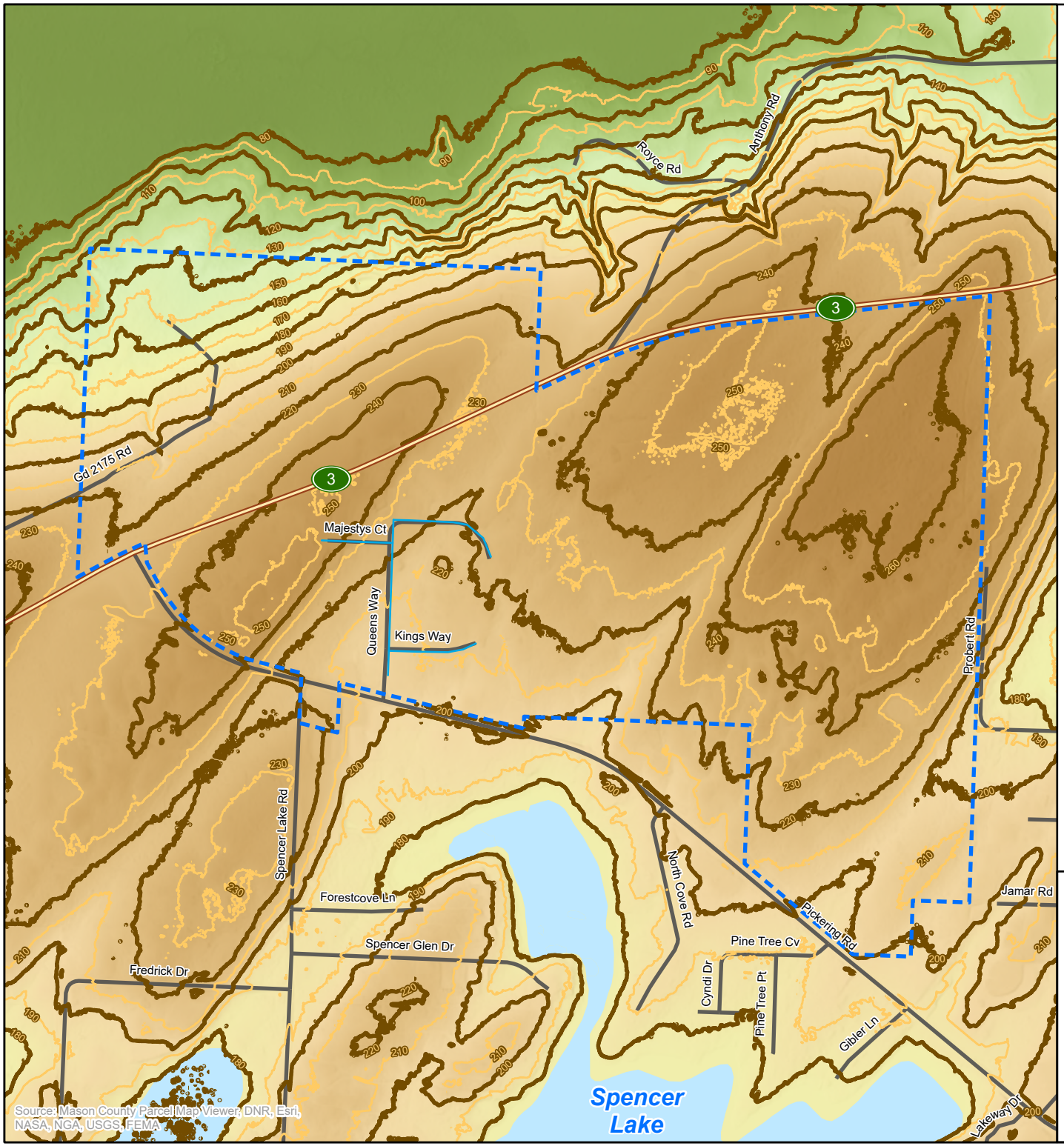

Elevation

270 ft

72 ft

Contour (Ft.)

10'

20'

Reference

Waterline

Highway

Road

Water Service Area & Retail Service Area

Surface Water

N

0 500 1,000 Feet

MASON COUNTY PUD 1

WONDERLAND WATER SYSTEM PLAN

FIGURE 1-5

TOPOGRAPHY

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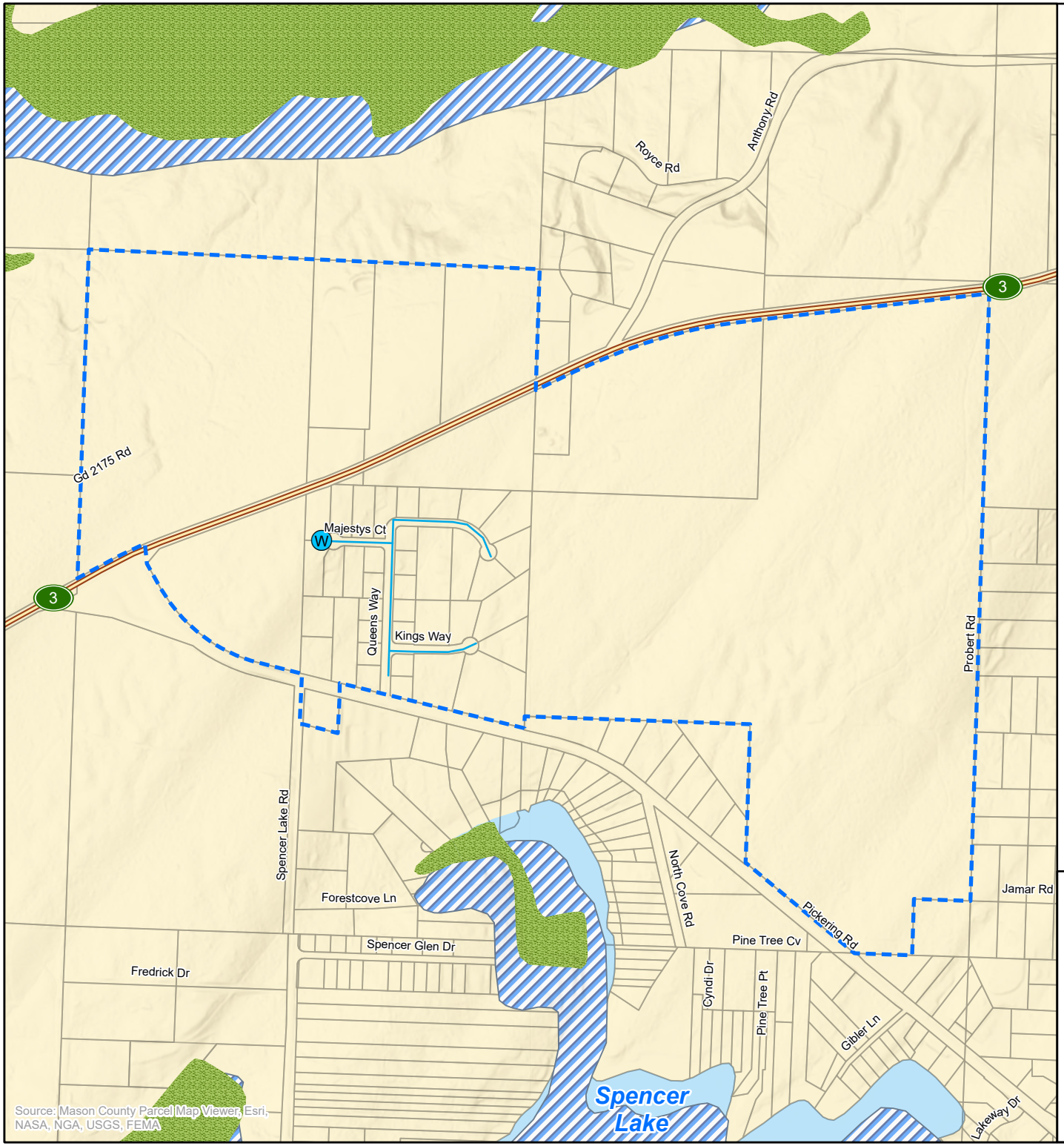

Wetland

Marsh, Swamp, Bog, Prairie

FEMA Flood Zone

100-Year Floodplain

Reference

Well

Waterline

Highway

Water Service Area & Retail Service Area

Parcel

Surface Water

N

0 500 1,000 Feet

MASON COUNTY PUD 1

WONDERLAND WATER SYSTEM PLAN

FIGURE 1-6

CRITICAL AREAS

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CHAPTER 2

BASIC PLANNING DATA

OBJECTIVE

This chapter provides essential planning data and water demand forecasts to evaluate the system's current and future capacity. It examines existing and projected populations, service connections, and water use data, while also developing water demand estimates based on the equivalent residential unit (ERU) metric. Additionally, the chapter includes water demand forecasts for the 10- and 20-year planning periods.

The water demand forecast at the conclusion of this chapter will be used to inform the capacity analysis in Chapter 3, the water use efficiency goals in Chapter 4, and capital improvement projects in Chapter 8.

POPULATION AND CONNECTIONS

At present, Wonderland only serves residential customers and does not service any commercial, industrial, agricultural or multi-family service connections. Should consolidation with the Wicked Delights Bakery water system be approved as part of this planning effort, the system would service a single commercial connection.

The Wonderland Water system was originally designed to serve a 65-lot subdivision; however, at present, it is approved only for 42 services.

SYSTEM CONNECTIONS

Mason County PUD 1 (PUD) records indicate that as of 2025 the Wonderland Water System includes 34 service connections. All existing connections are considered full-time, single-family connections.

POPULATION

Office of Financial Management (OFM) data between 2019 and 2023 estimates 2.58 persons per household for Mason County. Using the characteristic persons per household value for Mason County and number of service connections in the water system, the Wonderland Water System is estimated to serve a population of 88 full-time residents.

HISTORIC SYSTEM DEMANDS

This section analyzes historical system demands based on total production, consumption, and consumption per connection for the Wonderland Water System. These data will inform projected water system demands later in this chapter.

WATER PRODUCTION

Annual metered water production for Wonderland from 2018 to 2024 is summarized in Table 2-1.

Two data discrepancies were identified when analyzing production data.

First, well production data for 2020 through 2024 was less than the consumption of the same years, suggested that customers were consuming more water than the well had produced. Further investigation revealed that this abnormality coincided with the PUD installing a new source meter in 2020 which has consistently under read source production. To remedy the discrepancy between production and consumption volumes, an adjustment factor was chosen based on historic average distribution system leakage (DSL). The average DSL from 2018 to 2020 was approximately 25 percent. The consumption for a given year was be multiplied by a factor of 1.33 to approximate a production volume that factors in the 25 percent historic DSL. This method was used to determine production from 2020 through 2024 which are shown in Table 2-1.

The second data abnormality was that no production was recorded for July 2018. This was approximated by taking the average monthly July production volumes from 2019 to 2024. This approximated production value for July 2018 is included in the yearly total for 2018 in Table 2-1.

Average Daily Demand (ADD), which can also be referred to as average day production, is also computed in Table 2-1 by dividing the total quantity of water produced over a calendar year by the number of days in a given year.

TABLE 2-1

Total Water Production by Calendar Year

Year	Metered Water Production (gal/yr)[2]	Estimated Water Production[3] (gal/yr)	ADD (gpd)
2018[1]	2,420,476	-	6,631
2019	2,537,665	-	6,953
2020	-	2,853,646	7,797
2021	-	3,200,012	8,767
2022	-	2,895,641	7,933
2023	-	3,058,795	8,380
2024	-	4,061,106	11,096

(1) Production data for July 2018 was not recorded and was approximated as the average production for July from 2019 through 2024.

(2) Metered production values for 2020 through 2024 were omitted as they were smaller than metered production

(3) Production data between October 2020 and December 2024 were estimated by multiplying consumption data by a factor of 1.33 due to concerns with production meter accuracy during this period.

WATER DEMANDS

Consumption

Table 2-2 presents total annual consumption and average daily consumption for the Wonderland Water System from 2018 to 2024. It is worth noting that consumption data for July 2018 was missing. As a result, the value for that month was estimated using the average July consumption volumes from 2019 through 2024.

TABLE 2-2

Total Water Consumption by Calendar Year

Year	Total Consumption (gal/yr)	Average Daily Consumption (gpd)
2018[1]	1,830,491	5,015
2019	1,905,754	5,221
2020	2,218,388	6,061
2021	2,406,024	6,592
2022	2,177,174	5,965
2023	2,299,846	6,301
2024	3,053,463	8,343

(1) Consumption data for July 2018 was not recorded and was approximated as the average consumption for July from 2019 through 2024.

Over the last 7 years, the total annual water consumption for the system has increased from approximately 1.8 million gallons to 3.1 million gallons with a notable uptick occurring during the Covid-19 pandemic as well as in 2024.

Equivalent Residential Units

The concept of Equivalent Residential Units (ERUs) is used as a means to express water that is used by non-residential customers, lost to the environment via leakage, and taken for unauthorized uses as an equivalent number of residential customers. An ERU is defined as being equivalent to an average single-family residential (SFR) connection, so each SFR is considered one ERU. Average Day Demand per ERU (ERU_{ADD}) is calculated by dividing the total water volume used by the single-family residential (SFR) or full-time residential customer class by the total number of active residential connections. The water volume used by other customer classes can then be divided by this average to determine the number of ERUs utilized by non-residential customers. All connections within the Wonderland System are residential. Table 2-3 presents the estimated average daily water use per ERU_{ADD}.

TABLE 2-3

Average Day Water Use per ERU

Year	Average Daily Residential Consumption (gpd)	Residential Connections	ERU_{ADD} (gpd)
2018	5,015	34	148
2019	5,221	34	154
2020	6,061	34	178
2021	6,592	34	194
2022	5,965	34	175
2023	6,301	34	185
2024	8,343	34	245
Average	**6,216**	**-**	**183**
Average (2022-2024)	**6,870**	**-**	**202**

Between 2018 and 2024 the average ERU_{ADD} is 183 gpd/ERU; however, ERU_{ADD} has notably increased in recent years. 202 gpd/ERU for the last three years. As a result, water demand projections at the end of this chapter as well as the capacity analysis in Chapter 3 will use the 2022 through 2024 average ERU_{ADD} of 202 gpd/ERU.

PEAKING FACTORS

To forecast maximum day and peak hour demands for the Wonderland Water System, peaking factors have been derived based on historical and characteristic water demand data.

Maximum Day Demand and Maximum Day Demand Peaking Factor

Maximum daily demand (MDD) is the highest actual or estimated quantity of water that is expected to be used over a 24-hour period, excluding unusual events or emergencies (WAC 246-290-010). MDD can also be referred to as maximum day production. The DOH *2020 Water System Design Manual* (WSDM) recommends using daily water use data to calculate the maximum daily demand (MDD); however, daily data is unavailable for the Wonderland Water System. A *WSDM* method for determining MDD and the maximum day peaking factor is outlined below.

Given that the PUD does not record daily production at the Wonderland system, MDD for this plan was computed using the method outlined in Section 3.4.1 of the WSDM. This method computes the max month average day demand (MMADD) for a given year from the month of highest water production. The MMADD is then multiplied by a 1.65 factor in order to determine a conservative estimate for MDD. From there the peak hour peaking factor can be determined using the standard method of taking the ratio of MDD and ADD. Table 2-4 summarizes MMADD, estimated MDD, and MDD peaking factor for 2018 through 2024.

TABLE 2-4

Maximum Month Average Day Demand (MMADD) Peaking Factor

Year	ADD (gpd)	Maximum Month Demand (gallons)	Maximum Month Average Daily Demand (MMADD) (gpd)	MMADD Peaking Factor[(1)]	Estimated MDD (gpd)[(2)]	MDD/ADD Peaking Factor[(3)]
2018	6,631	407,983	13,161	1.65	21,715	3.27
2019	6,953	301,444	9,724		16,045	2.31
2020	7,797	439,300	14,171		23,382	3.00
2021	8,767	490,595	15,826		26,112	2.98
2022	7,933	359,237	11,588		19,121	2.41
2023	8,380	382,098	12,326		20,337	2.43
2024	11,096	524,181	16,909		27,900	2.51

(1) MDD:MMADD ratio of 1.65 is recommended per Chapter 3.4.1 of the DOH *Water System Design Manual.*

(2) Estimated MDD is calculated by multiplying MMADD*1.65.

(3) MDD Peaking Factor is calculated by dividing the Estimated MDD by ADD for a given year.

Similar to ERU_{ADD}, ERU_{MDD} is the amount of water a typical full-time single-family residence consumes during the highest demand day of the year, and is the ERU value used for assessing the water system's physical capacity. ERU_{MDD} can be computed by multiplying ERU_{ADD} of a given year by the corresponding year's max day peaking factor. These calculations are summarized in Table 2-5.

TABLE 2-5

Maximum Day Demand Water Use per ERU

Year	ERU_{ADD} (gpd)	MDD/ADD Peaking Factor	ERU_{MDD}[(1)] (gpd)
2018	148	3.29	485
2019	154	2.31	354
2020	178	3.00	535
2021	194	2.98	577
2022	175	2.41	423
2023	185	2.43	450
2024	245	2.51	617
Average			**491**
Average (2022-2024)			**497**

(1) ERU_{MDD} is calculate by multiplying ERU_{ADD} by the MDD Peaking Factor.

The same uptick in water demand can be noted for ERU_{MDD}. With an average value of 491 gpd/ERU over the last seven years, 497 gpd/ERU between 2022 and 2024, and a peak value of 617 gpd/ERU occurring in 2024. For the purposes of water demand projections and capacity analysis a conservative ERU_{MDD} value of 617 gpd/ERU and the corresponding MDD Peaking Factor of 3.05 (calculated by dividing ERU_{MDD} by ERU_{ADD}) will be used.

Peak Hour Demand

Peak Hour Demand (PHD) is the highest consumption that the system is likely to experience. Peak hour demand is typically 1.5 to 2.5 times higher than MDD. Direct records of PHD are not available, and PHD is estimated using Equation 3-1 from the WSDM:

$$PHD = (ERU_{MDD}/1440)\ [(C)(N) + F] + 18$$

Where:

PHD = Peak Hour Demand total system, gallons per minute
C = Coefficient Associated with Ranges of ERUs Table 3-1
N = Number of ERUs based MDD
F = Factor Associated with Ranges of ERUs Table 3-1

ERU_{MDD} = Maximum Day Demand per ERU, gpd

For a system serving 51 to 100 ERUs, the factors C and F are 2.5 and 25. Assuming an ERU_{MDD} value of 617 gpd/ERU. Table 2-6 summarized the estimated historical PHD and the resulting Peak Hour Peaking Factors.

TABLE 2-6

Historic Peak Hour Peaking Factor

Year	Number of System ERUs	ERU_{MDD} (gpd)	Peak Hour Demand(1) (gpm)	Estimated MDD (gpm)	Peak Hour Peaking Factor(1)
2018	34	483	52	15.1	3.46
2019	34	354	43	11.1	3.87
2020	34	535	56	16.2	3.44
2021	34	577	59	18.1	3.25
2022	34	423	48	13.3	3.61
2023	34	450	50	14.1	3.53
2024	34	617	62	19.4	3.18
Average					**3.48**

(1) Estimated using the equation PHD = (ERU_{MDD}/1440) [(C)(N) +F] +18 defined above.
(2) The Peak Hour Peaking Factor is calculated by dividing PHD by Estimated MDD.

A peak hour peaking factor of 3.48 was used for the water demand forecast at the conclusion of this chapter.

DISTRIBUTION SYSTEM LEAKAGE

Distribution System Leakage (DSL) is defined in the Water Use Efficiency (WUE) Rule as the difference between metered production and authorized water usage, including the sum of water sales, metered non-sale water usage, and estimated unmetered water usage. The Water Use Efficiency Rule also states that a utility's 3-year running average for DSL should not exceed 10 percent of water production. Annual total water production and consumption as well as DSL volume, percentage, and 3-year rolling average are summarized in Table 2-7.

TABLE 2-7

Estimated Distribution System Leakage

Year	Total Production (gal/yr)	Total Consumption (gal/yr)	DSL (gal)	DSL%	3-year Rolling Average DSL[2]
2018	2,420,476	1,830,491	589,986	24%	
2019	2,537,665	1,905,754	631,910	25%	
2020	2,853,646	2,218,388	635,257	-	-
2021	3,200,012	2,406,024	793,988	-	-
2022	2,895,641	2,177,174	718,467	-	-
2023	3,058,795	2,299,846	758,949	-	-
2024	4,061,106	3,053,463	1,007,643	-	-
Average[(1)]	**2,479,071**	**1,868,122**	**610,948**	**25%**	**-**

(1) The average reported is for years 2018 to 2019.

As shown in Table 2-7, the Wonderland Water System can only report DSL for 2018 and 2019 as these were the only years where accurate production meter data are available. As a result, the DSL average data is that of 2018 and 2019.

As previously mentioned, the WUE rule requires that systems maintain a 3-year running average DSL rate of 10 percent or less. As there is not enough data to calculate the 3-year running average DSL it is assumed to be the average of the years reported. Thus, the estimated DSL at Wonderland is 25 percent and above the 10 percent or less requirement. Water use efficiency, including measures, goals, and a water loss control action plan, are discussed further in Chapter 4.

WATER DEMAND FORECAST

LAND USE AND BUILDOUT ANALYSIS

It is anticipated that future land use within the Wonderland retail service area (RSA) will remain residential (RR5), as the unincorporated area is currently zoned by Mason County. A buildout analysis was conducted to estimate the maximum number of ERUs that could be exist within the Wonderland RSA. This maximum number was determined by taking the area of each parcel that is currently undeveloped and dividing it by the 5-acre minimum lot size allowed under RR5 zoning and rounding down to only count entire potential new lots. It was assumed that each buildable lot could be equated with a single ERU. The number of ERUs that could be added to the service area was estimated to be 48). This would result in a total buildout of 82 residential ERUs which is equivalent to a population of 212 people. Two additional commercial ERUs will be added as part of the consolidation with the Wicked Delights Bakery bringing the total potential buildout to 84 ERUs.

PROJECTED ERUS

Water system projections will use the Mason County middle-range growth rate of 1.01 percent per year outlined in the 2022 Office of Financial Management (OFM) Projections of The Total Resident Population for Growth Management data. Beginning in 2026, an additional two ERUs will be added to account for the potential consolidation of the Wicked Delights Bakery Water System. The two ERU demand for the Wicked Delights Bakery was determined by assigning the generic demand of a "store" (400 gpd) based on Table 3-2 of the WSDM.

WATER DEMAND PROJECTIONS

To project water demands for the Wonderland Water System, it is assumed that water use will be proportional to the total number of ERUs. Characteristic water demand parameters described in this chapter, such as ERU_{ADD}, max day peaking factor, and peak hour peaking factor are applied to the projected ERU count to estimate future water demands. DSL is assumed to remain at a constant 25 percent. Water use projections through the 10- and 20-year planning periods are presented in Table 2-8.

TABLE 2-8

Projected Water System Demands

Year	Residential ERUs	Commercial ERUs	Residential + Commercial ERUs	Average Day Consumption (gal)	DSL			Total ERUs	Average Day Demand (gpd)[2]	Maximum Day Demand (gpd)[3]	Peak Hour Demand (gpm)[4]
					%	Volume (gpd)[1]	ERU				
2025	34	0	34	6,870	25%	2,290	11	45	9,159	27,936	67
2026	34	2	36	7,343	25%	2,448	12	48	9,790	29,861	72
2027	35	2	37	7,416	25%	2,472	12	49	9,887	30,157	73
2028	35	2	37	7,488	25%	2,496	12	49	9,984	30,451	74
2029	35	2	37	7,560	25%	2,520	12	50	10,080	30,743	74
2030	36	2	38	7,630	25%	2,543	13	50	10,173	31,027	75
2031	36	2	38	7,699	25%	2,566	13	51	10,266	31,311	76
2032	36	2	38	7,768	25%	2,589	13	51	10,358	31,591	76
2033	37	2	39	7,836	25%	2,612	13	52	10,448	31,867	77
2034	37	2	39	7,903	25%	2,634	13	52	10,538	32,141	78
2035	37	2	39	7,969	25%	2,656	13	53	10,625	32,407	78
2036	38	2	40	8,035	25%	2,678	13	53	10,713	32,674	79
2037	38	2	40	8,099	25%	2,700	13	53	10,799	32,938	80
2038	38	2	40	8,164	25%	2,721	13	54	10,885	33,200	80
2039	39	2	41	8,228	25%	2,743	14	54	10,971	33,460	81
2040	39	2	41	8,290	25%	2,763	14	55	11,054	33,714	81
2041	39	2	41	8,353	25%	2,784	14	55	11,137	33,967	82
2042	40	2	42	8,414	25%	2,805	14	56	11,219	34,218	83
2043	40	2	42	8,475	25%	2,825	14	56	11,300	34,466	83
2044	40	2	42	8,536	25%	2,845	14	56	11,381	34,713	84
2045	41	2	43	8,596	25%	2,865	14	57	11,461	34,956	84
Buildout	82	2	84	16,972	25%	5,657	28	112	22,629	69,019	167

(1) The historical DSL percentage used is 25 percent.
(2) Average Day Demand (ADD) is the projected number of ERUs times the ERU_{ADD} factor of 202 gpd per ERU from Table 2-3.
(3) Maximum Day Demand is calculated using the MDD Peaking Factor of 3.05 multiplied by the Average Day Demand.
(4) Peak Hour Demand is calculated using the Peak Hour Peaking Factor of 3.48 multiplied by the Maximum Day Demand.

CHAPTER 3

SYSTEM ANALYSIS

OBJECTIVE

Water system planning is based on a methodological analysis of a water utility's ability to meet level of service standards for existing and future customers. The water system's ability to meet current and future demands is an important consideration in water system planning. In addition to demand considerations, water quality plays a major role in determining the adequacy and compliance of a water system. The five components analyzed in this chapter's system analysis include:

1. System Design Standards
2. Water Quality Analysis and compliance
3. Asset Management
4. Capacity Analysis of Water System Components
5. Summary of System Deficiencies

SYSTEM DESIGN STANDARDS

BASIS OF DESIGN STANDARDS

State Standards

The standards for planning and design for the Mason County PUD No. 1 water systems are based on commonly accepted standards including the following:

- **WAC 246-290, *Group A Public Water Systems*, Washington State Board of Health (Most current revision)**

  This is the primary drinking water regulation used by the Washington State Department of Health (DOH) that sets basic standards to assess capacity, water quality, and system reliability.

- ***Water System Design Manual*, Washington State Department of Health (June 2020)**

  These standards serve as guidance for the preparation of plans and specifications for Group A public water systems in compliance with WAC 246-290.

- ***Water System Planning Guidebook, Washington State Department of Health (August 2020)***

  The Water System Planning Guidebook outlines planning requirements as well as a framework for water systems to create a WSP that best fits their size and needs. Significant revisions to the former Water System Guidebook were adopted in August 2020.

- **Standard Specifications for Road, Bridge and Municipal Construction, Washington State Department of Transportation, American Public Works Association (2025)**

  These standards include detailed specifications for materials and workmanship of a wide variety of public works projects, including installation of public water supply facilities and restoration or facilities impacted by water main construction and repair.

PUD Standards

- **Mason County PUD No. 1 Design Standards**

  These standards include detailed specifications for materials and workmanship for the installation of water main extensions, including piping installation details, thrust blocking, inline valves, fire hydrants, air release valves, service connections of various types, sample stations, blowoffs, and pavement restoration applicable to developer extensions. A copy of these standards is contained in the Mason County PUD No. 1 Part A Water System Plan.

GENERAL FACILITY STANDARDS

General Design Standards

Table 3-1 lists the recommended standards from the DOH Water System Design Manual and Mason County PUD No. 1 policies regarding each standard for general facility design.

TABLE 3-1

General Facility Requirements

Standard	DOH Water System Design Manual	Wonderland Water System Standards
Average Daily and Maximum Day Demand	Average Daily Demand (ADD) must be determined from metered water use production data. Maximum Month Average Day Demand (MMADD) is estimated at approximately 1.65 for systems serving fewer than 1,000 people. MDD is calculated by multiplying MMADD*1.65	Based on analysis in Chapter 2, standards are as follows: ERU_{ADD} = 202 gpd/ERU ERU_{MDD} = 617 gpd/ERU
Peak Hourly Demand	Peak hourly demand (PHD) is determined using the following equation: PHD = $(ERU_{MDD}/1440)$ ((C)(N) + F) + 18 C = Coefficient from DOH Water System Design Manual Table 3-1 N = Number of connections, ERUs F = Factor from DOH Water System Design Manual Table 3-1 ERU_{MDD}= Maximum Day Demand per ERU (gallons per day)	Same as DOH Standard. Peak Hour Peaking Factor = 3.48
Minimum System Pressure	The system must be designed to maintain a minimum of 30 psi in the distribution system under peak hour demand and 20 psi under fire flow conditions during MDD.	Same as DOH Standard. System does not provide fire flow.
Maximum System Pressure	Regulations do not address maximum system pressure. The Water System Design Manual, Chapter 6, part 6.2.7, recommends that pressures should not exceed 80 psi.	The PUD's goal is to maintain distribution system pressures below 80 psi.
Minimum Pipe Size	WAC 246-290-230(2) states, "The minimum diameter of all distribution mains shall be six inches unless smaller mains can be justified by hydraulic analysis." WAC 246-290-230(3) states, "Systems designed to provide fire flows shall have a minimum distribution main size of 6 inches.	The PUD requires a minimum 8-inch diameter pipe for nonlooped lines, and 6-inch diameter pipes for looped lines, for new or replacement distribution mains.
Valve Spacing	Valving should be sufficient to minimize service disruptions during maintenance, repairs, replacements, or system expansions.	Valves every 1,000 feet, two gate valves at every tee and three at every cross unless otherwise directed by the PUD. Valves on each end of a water main in an easement.
Source Reliability	Combined source capacity for the water system is enough to provide the MDD in a period of 20 hours or less of pumping. Two or more supply sources are available with a capability to replenish depleted fire suppression storage within 72-hours while concurrently supplying the MDD for the water system. Redundancy in all critical pumping systems. Backup power supply for all critical pumping systems.	Same as DOH Standard.

FIRE SUPPRESSIONS STANDARDS

Per Mason County Code Section 14.18, existing, non-expanding water systems in Mason County are not required to provide fire flow. Therefore, no fire flow standards apply to the Wonderland Water System.

WATER QUALITY STANDARDS

Water quality monitoring is an important part of both regulatory compliance and water system oversight. Table 3-2 lists the existing drinking water regulations and actions taken by the PUD for the Wonderland water system. Some regulations are not included, as they do not apply to Wonderland. For example, the Filter Backwash Water Recycling Rule is not listed or discussed as it is not applicable.

Existing state law regulates bacteriological contaminants, inorganic chemicals and inorganic physical parameters (IOCs); volatile organic chemicals (VOCs); synthetic organic chemicals (SOCs); radionuclides; disinfection byproducts (DBPs) including total trihalomethanes (TTHMs), haloacetic acids (HAA5s), bromate, and chlorite; and disinfectant residuals. Recent water quality regulations include the revised lead and copper rule as well as per- and polyfluoralkyl substances (PFAS) monitoring. Together all these regulations define treated water quality standards and establish treated and/or source water quality monitoring schedules.

Minimum standards for water quality are specified in terms of Maximum Contaminant Levels (MCLs). Primary MCLs are based on chronic and/or acute human health effects. Secondary MCLs are based on factors other than health effects, including aesthetics. MCLs are specified in WAC 246-290 and described in the following pages and tables in this Chapter

TABLE 3-2

Existing Drinking Water Regulations[(1)]

Rule[(1)]	Regulated Contaminants[(2)]	Sample Location	Action
Arsenic Rule	Arsenic	Source	Monitoring
Inorganic Chemicals (IOC), and Physical Parameters	IOCs	Source	Monitoring
Volatile and Synthetic Organic Compounds	VOCs, SOCs	Source	Monitoring
Per- and Polyfluoroalkyl Substances	PFAS	Source	Monitoring
Radionuclides Rule	Radionuclides	Source	Monitoring
Revised Total Coliform Rule	Coliform – Distribution System	Distribution System	Monitoring

TABLE 3-2 – (continued)

Existing Drinking Water Regulations[(1)]

Rule[(1)]	Regulated Contaminants[(2)]	Sample Location	Action
Lead and Copper Rule	Lead, Copper	Distribution System	Monitoring
Revised Lead and Coper Rule	Lead, Copper	Distribution System	Monitoring and Inventory submitted by October, 2024
Consumer Confidence Report	Reporting Only	NA	In compliance

(1) Drinking water regulations as of April 2025.
(2) TTHM = Total Trihalomethanes; HAA5 = Five Haloacetic Acids; IOCs = Inorganic Chemical and Physical Characteristics; VOCs = Volatile Organic Chemicals; SOCs = Synthetic Organic Compounds.

WATER QUALITY ANALYSIS

The following sections evaluate the record of water quality for the Wonderland Water System. The water quality analysis is divided into four categories:

- Source Water Quality;
- Distribution System Water Quality;
- Water Quality Complaints; and
- Water Quality Reporting.

Minimum standards for water quality are specified in terms of Maximum Contaminant Levels (MCLs). Primary MCLs are based on chronic and/or acute human health effects. Secondary MCLs are based on factors other than health effects, including aesthetics. MCLs are specified in WAC 246-290 and described in the following pages and tables. Water quality data and a monitoring schedule are presented later in this Chapter.

SOURCE WATER QUALITY

Arsenic Rule

Description

Long-term exposure to low concentrations of arsenic in drinking water can lead to skin, bladder, lung, or prostate cancer. Non-cancer effects of ingesting arsenic at low levels include cardiovascular disease, diabetes, and anemia, as well as reproductive, developmental, immunological, and neurological effects. The EPA's Arsenic MCL is mg/L.

Monitoring Requirements and Analysis

The Arsenic Rule makes monitoring requirements consistent with monitoring for other IOCs. Groundwater sampling for arsenic is required once every 3 years. Any system that has a sampling point monitoring result exceed the MCL must increase the frequency of monitoring at that sampling point to quarterly sampling. Compliance with the MCL is based on the running annual average of the samples. Systems required to increase monitoring are not considered in violation of the MCL until they have completed 1 year of quarterly sampling. However, if any sample result causes the running annual average to exceed the MCL at any sampling point, the system is out of compliance with the MCL immediately.

IOC sample analyses were taken most recently in 2015 and 2024. Arsenic levels from Well S01 for both sampling years were less than the MCL.

Inorganic Chemical and Physical Water Quality

Description

WAC 246-290-310 specifies primary and secondary MCLs for inorganic physical and chemical characteristics. Primary MCLs are based on health effects, while secondary MCLs are based on factors other than health effects, such as aesthetics. Three chemicals, lead, copper, and sodium do not have primary or secondary MCLs, but are required to be monitored along with other IOCs. Lead and copper are regulated under the Lead and Copper Rule, described in detail later in this chapter. Sampling and compliance for these constituents is performed by the Mason County PUD 1 at the Wonderland Well.

Monitoring Requirements and Analysis

Groundwater sources must be sampled for inorganics once every 3 years, unless a monitoring waiver is granted by DOH. The System does have a nine-year waiver and was last sampled in October 2024. Nitrate samples are required annually and nitrite samples are required once every three years. Because nitrates and nitrites are included in Inorganic Chemical (IOC) sampling, additional individual samples are not required in years when an IOC is taken from the source. A list of these compounds and their MCLs are provided in Tables 3-3 and 3-4.

TABLE 3-3

Primary Water Quality Standards Inorganic Chemical Characteristics

Chemical	Primary MCL
Antimony (Sb)	0.006 mg/L
Arsenic (As)	0.01 mg/L
Asbestos	7 million fibers/liter (length > 10 microns)
Barium (Ba)	2.0 mg/L
Beryllium (Be)	0.004 mg/L
Cadmium (Cd)	0.005 mg/L
Chromium (Cr)	0.1 mg/L
Copper (Cu)	1.3 mg/L (Action Level, EPA)
Cyanide (HCN)	0.2 mg/L
Fluoride (F)	4.0 mg/L
Lead (Pb)	0.015 mg/L (Action Level, EPA)
Mercury (Hg)	0.002 mg/L
Nickel (Ni)	0.1 mg/L
Nitrate (as N)	10.0 mg/L
Nitrite (as N)	1.0 mg/L
Selenium (Se)	0.05 mg/L
Sodium (Na)	20 mg/L (EPA recommendation)
Thallium (Tl)	0.002 mg/L

Source: WAC 246-290-310.

There were no primary IOCs exceeding the MCL in the Wonderland Water System, which complies with IOC standards.

TABLE 3-4

Secondary Water Quality Standards Inorganic Chemical and Physical Characteristics

Chemical/Characteristic	Secondary MCL
Chloride (Cl)	250.0 mg/L
Fluoride (F)	2.0 mg/L
Iron (Fe)	0.3 mg/L
Manganese (Mn)	0.05 mg/L
Silver (Ag)	0.1 mg/L
Sulfate (SO4)	250.0 mg/L
Zinc (Zn)	5.0 mg/L
Color	15 Color Units
Specific Conductivity	700 umhos/cm
Total Dissolved Solids (TDS)	500 mg/L

Source: WAC 246-290-310.

TABLE 3-5

Manganese Sampling Results

Location	S01 Well Raw Water		
Analyte	Date	Well 1 (mg/L)	MCL (mg/L)
Manganese	10/16/2019	0.053	0.05
	10/26/2022	0.09	
	10/17/2024	0.04	

One secondary IOC did exceed the MCL in the Wonderland Water System. Manganese is an IOC whose concentration has historically been elevated in the Wonderland source water. Elevated manganese concentrations are often associated with elevated levels of iron. Results from the three most recent iron and manganese samples are shown in Table 3-5.

As shown in Table 3-5 manganese levels since 2019 have either exceeded or been near the MCL of 0.05 mg/L. Manganese is a secondary contaminant and Secondary Maximum Contaminant Levels (SMCL) are developed to protect the aesthetic qualities of drinking water and are not health based. A discussion on manganese treatment is described in Chapter 8, Capital Improvement Projects.

As previously discussed, nitrate sampling occurs annually and are summarized in Table 3-6.

TABLE 3-6

Annual Nitrate Sampling Results

Location	S01 Well Raw Water		
Analyte	Date	Well 1 (mg/L)	MCL (mg/L)
Nitrate	10/9/2019	<0.5000	10
	10/14/2021	<0.5000	
	10/15/2021	<0.5000	
	10/12/2022	<0.5000	
	10/11/2023	<0.5000	

Results of sampling show that nitrate levels were all non-detect.

Per- and Polyfluoroalkyl Substances

Description

Per- and polyfluoroalkyl substances (PFAS) have become an increased concern for groundwater contamination in recent years. The substances are used to manufacture heat-, grease-, oil-, stain-, and water-resistant materials and are commonly found in consumer goods such as clothing, nonstick cookware and food packaging, as well as fire retardants and surfactants. PFAS are resistant to heat and chemical degradation and can build up in people, animals and the environment over time. The chemicals in the group known as PFAS may lead to negative health effects, including cancer, liver damage, and negative effects on developing babies. PFAS are typically found in groundwater near military bases, airports, and local fire departments.

Monitoring Requirements and Analysis

In Washington State, DOH's PFAS rule took effect on January 2022 and established state action levels (SAL) for five PFAS commonly found in drinking water (WAC 246-290-315(4)). The rule will require water systems to monitor all active, permanent, and seasonal sources beginning in 2023 and no later than 2025.

In March, 2023 the EPA established federal regulatory levels for six PFAS, including the five PFAS regulated by Washington State. The EPA Maximum Contaminant Levels (MCLs) are more stringent than those established by Washington State, thus adhering to federal MCLs will achieve compliance with both regulations. State Action Levels and EPA MCLs. Sample results are displayed in Table 3-7.

TABLE 3-7

PFAS Monitoring

Compound	Mt Si Springs 7/24/23	Centennial Well 5/15/23	SAL	MCL
PFOA	ND	ND	10 ng/L	4.0 ng/L
PFOS	ND	ND	15 ng/L	4.0 ng/L
PFHxS	ND	ND	65 ng/L	10.0 ng/L
PFNA	ND	ND	9 ng/L	10.0 ng/L
HFPO-DA (commonly known as GenX Chemicals)	ND	ND	345 ng/L	10.0 ng/L
Mixtures containing two or more of PFHxS, PFNA, HFPO-DA, and PFBS	ND	ND	N/A	Hazard Index = 1.0

(1) One nanogram per liter (ng/L) is equal to part per trillion (ppt).

(2) The PFA Hazard Index (HI) is made up of a sum of fractions. Each fraction compares the amount of four PFAs measured to the level determined not to cause health effects. HE can be found using the following equation: $PFHxS_{measured}/9 + PFNA_{measured}/10 + PFBS_{measured}/2000 + GenX_{measured}/10$.

Sampling of raw water from Well S01 detected no measurable levels of PFAS, confirming the system's compliance with PFAS standards.

Radionuclides Rule

Description

Radionuclides include radioactive substances occurring naturally in subsurface waters. Regulated substances include radium-226, radium-228, uranium, and gross alpha and beta particles. Table 3-8 summarizes radionuclide MCLs as defined by EPA's Radionuclide Rule, WAC 246-290-310(7), and 40 CFR 141.66.

Monitoring Requirements and Analysis

WAC 246-290-300(10) and 40 CFR 141.26 require radionuclide samples at a frequency determined by initial sampling. North Bend's initial sampling showed no radionuclides at levels above the detection limits as a result samples are required to be taken every 6 years. A gross alpha particle activity measurement may be substituted for the required radium-226 and radium-228 analysis provided that the measured gross alpha particle activity does not exceed 5 pCi/L at a confidence level of 95 percent.

As shown on the Water Quality Monitoring Schedule in Appendix F, one sample is required for radionuclides every 6 years. The PUD has completed all radionuclide testing required.

October 2021 sampling results from for the radionuclide tests are below the state reporting limits of 1.0 pCi/L for Radium 228 and 3.0 pCi/L for Gross Alpha.

TABLE 3-8

Radionuclide MCLs

Radionuclide	MCL
Combined Radium -226 and -228	5 pCi/L
Uranium	30 μg/L
Gross Alpha (excluding uranium and radon)	15 pCi/L
Gross Beta	4 millirem/year

All previous tests before October 2021 were also below the state reporting limit. The Wonderland Water System is compliant with the standards for radionuclides.

Volatile Organic Compounds and Synthetic Organic Compounds

Description

Volatile organic chemicals (VOCs) are manufactured, carbon-based chemicals that vaporize quickly at normal temperatures and pressures. VOCs include many hydrocarbons associated with fuels, paint thinners, and solvents. This group does not include organic pesticides, which are regulated separately as synthetic organic chemicals (SOCs). VOCs are divided into the two following groups:

1. Regulated VOCs that have been determined to post a significant risk to human health.

2. Unregulated VOCs for which the level of risk to human health has not been established.

There are currently 21 regulated volatile organic Chemicals (VOCs) and 33 regulated Synthetic Organic Chemicals (SOCs). A list of these compounds and their MCLs is included in Tables 3-9 and 3-10.

Monitoring Requirements and Analysis

Per the DOH requirements, SOCs and VOCs must be sampled once every 3 years, unless a waiver is in place. The System does have a six-year waiver and last sampled in Fall 2023.

TABLE 3-9

Regulated Synthetic Organic Chemicals (SOC)

Synthetic Organic Chemical	Federal Regulation	Primary MCL (mg/L)[1]
Arochlor	Phase II	0.002
Aldicarb	Phase II[2]	0.003
Aldicarb sulfone	Phase II[2]	0.003
Aldicarb sulfoxide	Phase II[2]	0.004
Atrazine	Phase II	0.003
Carbofuran	Phase II	0.04
Chlordane	Phase II	0.002
Dibromochloro-propane	Phase II	0.0002
2,4-D	Phase II	0.07
Ethylene dibromide	Phase II	0.00005
Heptachlor	Phase II	0.0004
Heptachlor epoxide	Phase II	0.0002
Lindane	Phase II	0.0002

TABLE 3-9 – (continued)

Regulated Synthetic Organic Chemicals (SOC)

Synthetic Organic Chemical	Federal Regulation	Primary MCL (mg/L)[(1)]
Methoxychlor	Phase II	0.04
Polychlorinated biphenyls (PCBs)	Phase II	0.0005
Pentachlorophenol	Phase II	0.001
Toxaphene	Phase II	0.003
2,4,5-TP	Phase II	0.05
Benzo(a)pyrene	Phase V	0.0002
Dalapon	Phase V	0.2
Di(2-ethylhexyl) adipate	Phase V	0.4
Di(2-ethylhexyl) phthalate	Phase V	0.006
Dinoseb	Phase V	0.007
Diquat	Phase V	0.02
Endothall	Phase V	0.1
Endrin	Phase V	0.002
Glyphosate	Phase V	0.7
Hexachlorobenzene	Phase V	0.001
Hexachloro Cyclopentadiene	Phase V	0.05
Oxamyl (vydate)	Phase V	0.2
Picloram	Phase V	0.5
Simazine	Phase V	0.004
2,3,7,8-TCDD (dioxin)	Phase V	3x10-8

(1) 40 CFR 141.61(a) & (c); adopted by State Board of Health.
(2) Delayed; reproposal of MCLs for aldicarb compounds expected in the future.

TABLE 3-10

Regulated Volatile Organic Chemicals (VOC)

Volatile Organic Chemical	Federal Regulation	Primary MCL (mg/L)[(1)]
Vinyl Chloride	Phase I	0.002
Benzene	Phase I	0.005
Carbon Tetrachloride	Phase I	0.005
1,2-Dichloroethane	Phase I	0.005
Trichloroethylene	Phase I	0.005
para-Dichlorobenzene	Phase I	0.075
1,1-dichloroethylene	Phase I	0.007
1,1,1-Trichloroethane	Phase I	0.2
cis-1,2-Dichloroethylene	Phase II	0.07

TABLE 3-10 – (continued)

Regulated Volatile Organic Chemicals (VOC)

Volatile Organic Chemical	Federal Regulation	Primary MCL (mg/L)[(1)]
1,2-Dichloropropane	Phase II	0.005
Ethylbenzene	Phase II	0.7
Monochlorobenzene	Phase II	0.1
Ortho-Dichlorobenzene	Phase II	0.6
Styrene	Phase II	0.1
Tetrachloroethylene	Phase II	0.005
Toluene	Phase II	1
Trans-1,2-Dichloroethylene	Phase II	0.1
Xylenes (total)	Phase II	10
Dichloromethane	Phase V	0.005
1,2,4-Trichloro-benzene	Phase V	0.07
1,1,2-Thrichloro-ethane	Phase V	0.005

(1) 40 CFR 141.61(a) & (c); adopted by State Board of Health.

VOCs and SOCS have not been detected in any sample.

DISTRIBUTION SYSTEM WATER QUALITY

Distribution system water quality applies to a number of water quality monitoring requirements within the distribution system. Some water quality parameters change within the distribution system or in the plumbing of buildings. The following sections summarize the delivered water quality monitoring for the Wonderland Water System.

Revised Total Coliform Rule

Description

Coliform bacteria include a broad category of organisms routinely monitored in potable water supplies. Though not all coliform bacteria are pathogenic in nature, they are relatively easy to identify in laboratory analysis and are considered an indicator organism. If coliform bacteria are detected, then pathogenic organisms may also be present. Bacterial contamination in a water supply can cause a number of waterborne diseases, so coliform testing is strictly monitored and regulated by the DOH.

Monitoring Requirements and Analysis

WAC 246-290 establishes bacteriological testing requirements for public water systems. Compliance with this rule is based on the presence/absence of total coliforms. The number of routine samples required depends on the system size.

The Revised Total Coliform Monitoring Rule specifies each total coliform positive routine sample must be tested for the presence of E. coli; if any total coliform positive sample is also E. coli. positive, then the sample must be reported to the state by the end of the day. If a routine sample is positive for total coliform, repeat samples are required.

Within 24 hours of learning of the total coliform positive sample result, at least three repeat samples must be collected and analyzed for total coliform. One repeat sample must be collected from the same tap as the original sample, one repeat sample must be collected within five service connections upstream, and one repeat sample must be collected within five service connections downstream. If one or more repeat sample is positive for total coliform, the sample must be analyzed for E. coli. If the total coliform positive sample is positive for E. coli, the sample must be reported to the state. Another set of repeat samples must then be collected unless an assessment has been triggered and the state has been notified.

Wonderland monitors for bacteriological contaminants in accordance with its Coliform Monitoring Plan, which is included in Appendix D. The Wonderland Water System is required to perform a single monthly sample. Three samples are collected to cover the distribution area. Regulations for the bacteriological testing schedule are given in WAC 246-290-300(3). Total coliform samples taken in the last ten year have shown no positive test results.

Lead and Copper Monitoring

Description

In 1991, the EPA promulgated the Federal Lead and Copper Rule. The State of Washington adopted this rule in 1995, with minimal changes. The Lead and Copper Rule is intended to reduce the tap water concentrations of lead and copper that can occur when corrosive source water causes lead and copper to leach from water meters and other plumbing fixtures. Lead and copper monitoring is required to determine if lead or copper are leaching out of customer service lines at a rate that produces concentrations that are a health concern.

Monitoring Requirements and Analysis

The rule requires that 90 percent of the representative samples do not exceed the action levels for lead or copper. If a system takes fewer than ten lead and copper samples, the 90^{th} percentile value is determined by the average of the two highest sample results. If more than the allowable number of samples exceed the action level for either lead or copper, then the water system must act to reduce the corrosivity of the water, or take other actions, such as replacing water service lines, to reduce the level of lead and copper at the tap. The action level for lead is 0.015 mg/L and the action level for copper is 1.3 mg/L.

The highest measured copper sample was 0.2400 mg/L, and the highest measured lead sample was 0.0010 mg/L. Both samples are below the action level of 1.3 mg/L and 0.015 mg/L, respectively. Lead and copper monitoring results are summarized in Table 3-11.

TABLE 3-11

Lead and Copper Testing

Parameter	7/18/2024
Lead	
Action Level (mg/L)	**0.015**
Maximum Concentration (mg/L)	0.001
90th Percentile Concentration (mg/L)	0.001
Number of Samples Taken	5
Number of Samples Exceeding Action Level	0
Copper	
Action Level (mg/L)	**1.3**
Maximum Concentration (mg/L)	0.24
90th Percentile Concentration (mg/L)	0.208
Number of Samples Taken	5
Number of Samples Exceeding Action Level	0

Revised Lead and Copper Rule

The Revised Lead and Copper Rule (RLCR) set by the EPA took effect in October 2024. It focuses on the creation and maintenance of a lead service line inventory where the water purveyor is required to test the service line on both the purveyor and customer sides of the meter with the ultimate goal of replacing all lead service lines. The inventory was required to be submitted by October 2024. Water systems are required to identify and make public the locations of lead service pipes. The rule will also focus and establishing a "trigger level" for each containment. The EPA has also signaled its intent to emphasize testing for lead and copper in schools and child care facilities.

The Wonderland Water System still has yet to complete a lead line service inventory. However, the distribution system is made up of only 4-inch PVC pipe.

Consumer Confidence Report

Consumer Confidence Report Rule requires community water system purveyors to prepare and distribute an annual report of water quality analyses to their customers. The City is required to submit the Consumer Confidence Report (CCR) to its customers before the 1st of July each year. A copy of the City's 2023 CCR is included in Appendix E.

WATER QUALITY COMPLAINTS

Mason County PUD No. 1 handles water quality complaints pursuant to their policy noted in Chapter 1 of the Part A WSP. In response to water complaints, the water operator will generally investigate the validity of the complaint through an on-site investigation and will take corrective action if appropriate. The PUD's routine water main flushing program generally keeps water quality complaints to a minimum.

WATER QUALITY MONITORING SCHEDULE

Group A public community water systems must comply with the drinking water standards of the Federal Safe Drinking Water Act and its amendments. Table 3-12 indicates whether or not the regulation requires Wonderland to conduct monitoring or take other action. State law contains regulations concerning bacteriological contaminants, inorganic chemicals and inorganic physical parameters (IOCs), volatile organic chemicals (VOCs), synthetic organic chemicals (SOCs), and radionuclides. The Water Quality Monitoring Schedule is included as Appendix F.

TABLE 3-12

Source Monitoring Schedule and Waivers(1)

Test Panel/Analyte	Samples Required	Frequency	Last Sample Date	Next Sample Due
Nitrates	1	Standard – 1 Year	10/11/2023	October 2025
Complete Inorganics	1	Waiver – 9 Year	10/17/2024	May 2026
Manganese	1	Standard – 3 Year	10/17/2024	
VOCs	1	Waiver – 6 Year	4/22/2022	
Herbicides	1	Waiver – 9 Year	5/18/2022	May 2031
Pesticides	0	Waiver – 3 Year	5/24/2004	
Soil Fumigants	0	Waiver – 3 Year		
Gross Alpha	1	Standard – 6 Year	10/21/2021	
Radium 228	1	Standard – 6 Year	10/21/2021	
Lead and Copper	5	Standard – 3 year	7/18/2024	July 2027
Asbestos	0	Waiver – 9 year		

(1) As of March 2025.

SYSTEM COMPONENT ANALYSIS

The following sections evaluate the existing water system facilities in terms of their capacities, physical conditions, and performance capabilities. Facilities are evaluated relative to existing and projected requirements based on growth and demand projections from Chapter 2. An overview and general description of the system is presented in Chapter 1.

WATER RIGHTS ANALYSIS

Since the Wonderland Water System operates as a single closed zone and is pressurized by a single well, the instantaneous water rights must be able to provide peak hour demand. In the event that storage and a booster pump station is added, the well would no longer need to pressurize the zone and the instantaneous rights would only need to be required to provide maximum day demand.

Projected withdrawal rate requirements are compared to the Wonderland Water Rights in Table 3-13. Projected Annual Water Demands were developed in Table 2-8 and are provided in Table 3-13 in acre-feet per year. Projected Peak Hour Demand comes from Table 2-8 and provided below in Table 3-13.

TABLE 3-13

Projected Withdrawals

Year	Annual Withdrawal Qa			Instantaneous Withdrawal Qi		
	Authorized by Water Right (ac-ft/yr)	Projected Annual Average Demand (ac-ft/yr)	Surplus/ (Deficit) (ac-ft/yr)	Authorized by Water Right (gpm)	Projected PHD (gpm)	Surplus/ (Deficit) (gpm)
2025	120	10.3	109.7	100	67.5	33
2026		11.0	109.0		72.1	28
2027		11.1	108.9		72.8	27
2028		11.2	108.8		73.5	26
2029		11.3	108.7		74.3	26
2030		11.4	108.6		74.9	25
2031		11.5	108.5		75.6	24
2032		11.6	108.4		76.3	24
2033		11.7	108.3		77.0	23
2034		11.8	108.2		77.6	22
2035		11.9	108.1		78.3	22
2036		12.0	108.0		78.9	21
2037		12.1	107.9		79.6	20
2038		12.2	107.8		80.2	20
2039		12.3	107.7		80.8	19
2040		12.4	107.6		81.4	19
2041		12.5	107.5		82.0	18
2042		12.6	107.4		82.6	17
2043		12.7	107.3		83.2	17
2044		12.7	107.3		83.8	16
2045		12.8	107.2		84.4	16
Buildout		25.3	94.7		166.7	-67

As shown in Table 3-13, the Wonderland Water System has adequate instantaneous and annual water rights to meet projected growth through 2045. However, there is a deficit in a full buildout scenario.

SOURCE CAPACITY ANALYSIS

As mentioned in the water rights analysis section, the Wonderland Water System operates as a single closed zone and is pressurized by the system's only well, as a result the pumping capacity of the well must be able to meet peak hour demand. The ability of the existing well's pumping capacity to meet PHD through the 2045 planning period is summarized in Table 3-14.

In the event that storage and a booster pump station is added, the well would no longer need to pressurize the zone and the well would only need to be required to provide maximum day demand. The projected 2045 Maximum Day Demand (MDD) for the Wonderland System is 26,540 gallons per day (gpd), or 18.4 gallons per minute (gpm), while the MDD under a full buildout scenario is estimated at 32.6 gpm. The capacity of Well 1, assuming 20 hours of pumping in a 24-hour period is 96 gpm * 1,200 minutes = 115,200 gallons per day which exceeds the projected MDD. As shown in Table 3-11, Wonderland Well 1 is able to meet projected maximum day demand requirements for 20 hours of pumping through 2045.

TABLE 3-14

Projected Source Production Capacity

Year	Maximum Day Demand			Peak Hour Demand		
	20-Hour Source Pumping Capacity (gpd)	Projected (gpd)	Production Surplus/ (Deficit) (gpd)	Pumping Capacity (gpm)	Projected (gpm)	Production Surplus/ (Deficit) (gpm)
2025	115,200	27,936	87,264	96	67	29
2026	115,200	29,861	85,339	96	72	24
2027	115,200	30,157	85,043	96	73	23
2028	115,200	30,451	84,749	96	74	22
2029	115,200	30,743	84,457	96	74	22
2030	115,200	31,027	84,173	96	75	21
2031	115,200	31,311	83,889	96	76	20
2032	115,200	31,591	83,609	96	76	20
2033	115,200	31,867	83,333	96	77	19
2034	115,200	32,141	83,059	96	78	18
2035	115,200	32,407	82,793	96	78	18
2036	115,200	32,674	82,526	96	79	17
2037	115,200	32,938	82,262	96	80	16

TABLE 3-14 – (continued)

Projected Source Production Capacity

Year	Maximum Day Demand			Peak Hour Demand		
	20-Hour Source Pumping Capacity (gpd)	Projected (gpd)	Production Surplus/ (Deficit) (gpd)	Pumping Capacity (gpm)	Projected (gpm)	Production Surplus/ (Deficit) (gpm)
2038	115,200	33,200	82,000	96	80	16
2039	115,200	33,460	81,740	96	81	15
2040	115,200	33,714	81,486	96	81	15
2041	115,200	33,967	81,233	96	82	14
2042	115,200	34,218	80,982	96	83	13
2043	115,200	34,466	80,734	96	83	13
2044	115,200	34,713	80,487	96	84	12
2045	115,200	34,956	80,244	96	84	12
Buildout	115,200	69,019	46,181	96	167	-71

Table 3-14 shows that the Wonderland Water System has adequate source capacity to meet projected growth through 2045. However, at full buildout there is an inadequate source capacity for peak hour demand with a deficit of 71 gpm. A future reservoir and booster pump station would need to be constructed to allow for the Wonderland system to service the buildout demand. Storage requirements for such a reservoir will be considered in the following storage analysis to address this issue.

Finally, DOH also recommends that a system should be able to supply ADD with its largest source offline. The ADD at buildout is 22,629 gpd and Well 1 can produce an estimated 69,000 gallons with one pump out of service. As a result, Wonderland can meet the ADD source capacity requirement.

SOURCE CONDITION ANALYSIS

The well house was recently rebuilt in 2020 and the two captive air tanks were removed and replaced with eight 119-gallon bladder tanks and a new source meter was installed. However, it has become apparent that the source meter is faulty and needs to be replaced. In 2021, a backup generator with an automatic transfer switch (ATS) and four 120-gallon propane tanks were installed.

TREATMENT SYSTEM ANALYSIS

The Wonderland Water System does not currently treat its water and is not equipped to do so. However, as noted in the water quality section, source water has elevated manganese concentrations. Treatment options are detailed in the Capital Improvement Program in Chapter 8.

STORAGE ANALYSIS

The Wonderland Water System does not currently have water storage capabilities. However, the following analysis is provided to guide the planning and design of future storage facilities should the PUD elect to do so. This assessment considers projected demand and regulatory requirements to ensure adequate capacity and reliability for a potential future project.

Any future storage facility will likely be a ground level tank from which a booster station will draw water to pressurize the distribution system as a closed zone. The following analysis assumes that the reservoir will be designed without dead storage. Storage standards are based on recommendations of the DOH *2020 WSDM*.

Operational Storage (OS)

Operational storage is the volume at the top of the reservoir devoted to supplying the water system under normal operating conditions while the sources of supply are in the "off" status. This volume is typically established to prevent excessive cycling of wells and booster pumps.

When the new reservoir is constructed, the Wonderland Well will be called on when the reservoir reaches the level corresponding to the bottom of the operational storage and off when the reservoir is full.

Assuming a reservoir of 20 by 40 feet, the operational storage for the Wonderland reservoir is determined as follows:

Depth of Operating Storage (d) = 3.0 ft

OS = (3.0 ft) x $(\frac{\pi\ 20^2}{4})$ x 7.48 gallons/cf = 7,050 gallons

An OS volume of 7,050 gallons is included in the storage analysis summary in Table 3-12.

Equalizing Storage

Equalizing storage is used to meet peak hour demands that exceed the system's non-emergency source capacity. The volume of equalizing storage depends on peak hour system demands, the length of time the peak hour demands persist, and the source production rate. Sufficient equalizing storage must be provided such that peak system demands can be satisfied.

The *WSDM* recommends that equalizing storage be calculated using the following equation, but in no case should it be less than zero:

$$V_{ES} = (Q_{PH} - Q_S) \times 150\ minutes$$ Equation 7-1, DOH Manual

Where,

V_{ES} = Equalizing storage component, gallons
Q_{PH} = Peak hourly demand, gpm
Q_S = Total source of supply capacity, excluding emergency sources, gpm

As show in Table 3-12 the Wonderland Water System's equalizing storage requirements are zero through the 20-year planning period because total source capacity is larger than projected peak hour demand. However, in a buildout scenario the equalizing storage would be 10,605 gallons.

Standby Storage

Standby Storage is provided in order to meet demands in the event of a system failure such as power outage, an interruption of supply, or break in a major transmission line. Municipalities determine the amount of emergency storage based on the reliability of supply and pumping equipment, standby power sources, and the anticipated length of time the system could be out of service.

DOH provides an equation and recommendation for the volume of water that should be provided for the SB. Additionally, DOH recommends that the SB volume provide the ERU_{MDD} for one day and be no less than 200 gallons per ERU.

$$SB = (N)(SBi)(Td)$$ Equation 7-2, DOH Manual

Where,

SB = total standby storage component for a single source system, gallons
SBi = Locally adopted unit SB volume in gallons per day per ERU
N = Number of ERU for the design year
Td = Number of days selected to meet water system-determined standard of Reliability =1 day

For this analysis of the Wonderland Water System, ERU_{MDD} is 617 gpd per ERU, N is the number of ERUs over the 20-year projection horizon. Table 3-15 summarizes the results of the analysis.

Fire Suppression Storage

Currently, no fire flow is provided or required. Future coordination with Mason County Fire Department should be pursued before expansion of service into the future service area.

TABLE 3-15

Storage Requirements for Future Reservoir

Year	Operational Storage (gallons)	Equalizing Storage (gallons)	Standby Storage (gallons)	Fire Suppression Storage (gallons)	Total Storage Recommended (gallons)
2025	7,050	0	27,971	0	35,021
2026	7,050	0	29,898	0	36,948
2027	7,050	0	30,194	0	37,244
2028	7,050	0	30,489	0	37,539
2029	7,050	0	30,781	0	37,831
2030	7,050	0	31,066	0	38,116
2031	7,050	0	31,349	0	38,399
2032	7,050	0	31,630	0	38,680
2033	7,050	0	31,907	0	38,957
2034	7,050	0	32,181	0	39,231
2035	7,050	0	32,447	0	39,497
2036	7,050	0	32,714	0	39,764
2037	7,050	0	32,979	0	40,029
2038	7,050	0	33,242	0	40,292
2039	7,050	0	33,502	0	40,552
2040	7,050	0	33,755	0	40,805
2041	7,050	0	34,009	0	41,059
2042	7,050	0	34,260	0	41,310
2043	7,050	0	34,509	0	41,559
2044	7,050	0	34,756	0	41,806
2045	7,050	0	34,999	0	42,049
Buildout	7,050	10,611	69,104	0	86,765

The PUD has elected to use the full buildout scenario's storage requirements of 86,765 gallons when sizing a future reservoir project.

DISTRIBUTION SYSTEM ANALYSIS

The following sections evaluate the general condition and the hydraulic capacity of the water distribution system.

General Description and Condition

The Wonderland water distribution system is described in general terms in Chapter 1 under the heading Distribution System. The water distribution system was constructed in 1973, and is approximately 52 years old. All pipes are 4-inch diameter PVC. PVC pipe is expected to have a life span of 75 to 100 years, depending on the grade of PVC pipe used and the methods for joining and bedding the pipe.

Glue joints are a common location for failure of PVC pipe systems. Gasketed joints are preferable, although sometimes not available in very small pipe sizes. Improper bedding with large angular rock bearing on the pipe can reduce the life expectancy of PVC pipe. Currently the DSL is on average 25 percent and could be due to the condition of the pipes within the distribution system. Since no information is available on the joining methods or bedding standards used when the pipe was installed, the life expectancy of the Wonderland Water System pipes is uncertain.

Hydraulic Modeling and Analysis

The development of a computer hydraulic model, which can accurately and realistically simulate the performance of a water system in response to a variety of conditions and scenarios, has become an increasingly important element in the planning, design, and analysis of municipal water systems. The Washington State Department of Health's WAC 246-290 requires hydraulic modeling as a component of water system plans.

The Wonderland Water System Model was created using a software called InfoWater Pro by Innovyze, which operates in an ArcGIS Pro environment. Steady-state modeling was used for this analysis. To develop the hydraulic model, the basic layout of the water system was created within the InfoWater model. The lengths, diameters, and connection points of system piping were assigned using an updated base map of the water system. The location of the well is approximated based on water system base maps. Elevations of system components were determined using LiDAR topography data. A map of the water system model, including pipe and junction identifications, is shown in Figure 3-1.

The hydraulic analysis scenarios and results are further discussed below and tabulated results can be found in Appendix G. The assumptions regarding the modeling of all sources of supply and system demands are included in the following sections.

Source

The Wonderland Well 1 is modeled as a fixed head reservoir, with a water level equal to the low pressure setting of the pump (35 psi), to simulate a worst-case scenario. This reservoir is regulated by a flow control valve that is set to the pump capacity of 96 gpm.

System Demands

A key component of the hydraulic modeling process is the allocation of water demand throughout the distribution system. Total system demand was derived from the projected values presented in Table 2-10. Both existing and future projected demands were distributed across the service junctions under the assumption that spatial variation in demand is minimal. This assumption is considered reasonable given that the service area is composed exclusively of single-family residences, which are relatively uniform in spacing and water usage across the currently served area. Table 3-16 shows the distribution of system demands for each scenario.

The following scenarios and their respective demands were modeled:

- 2025 Peak Hour Demands: These demands were used to determine if the existing system is able to meet the DOH Standards to supply the current domestic PHD while maintaining a minimum system-wide pressure of 30 psi.

- 2035 Peak Hour Demands: These demands were used to determine if the existing system is able to meet the DOH Standards to supply the 10-year projected domestic PHD while maintaining a minimum system-wide pressure of 30 psi.

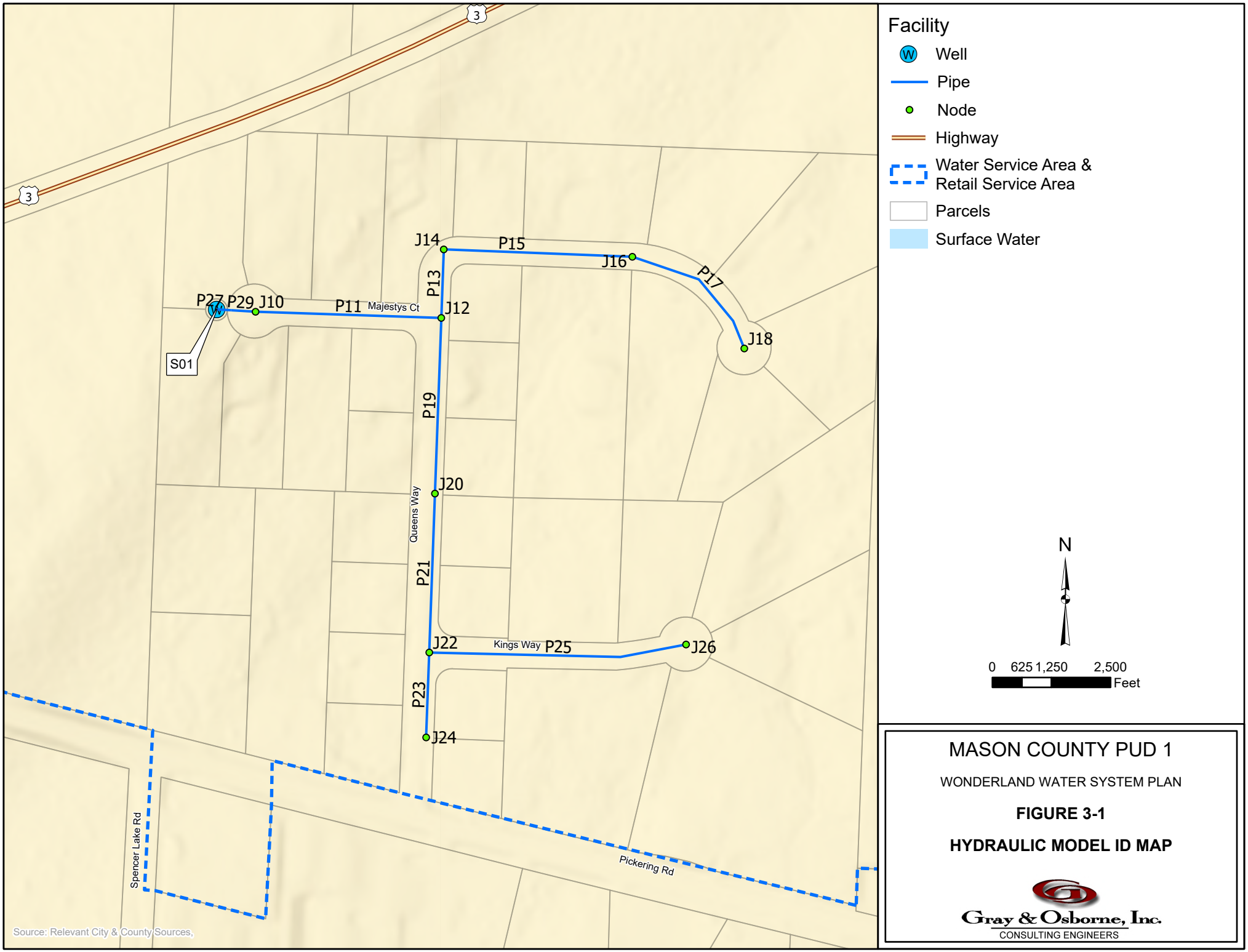
- 2045 Peak Hour Demands: These demands were used to determine if the existing system is able to meet the DOH Standards to supply the 20-year projected domestic PHD while maintaining a minimum system-wide pressure of 30 psi.

TABLE 3-16

Hydraulic Model Demand Scenarios

Scenario	PHD (gpm)	Demand/Node[(1)] (gpm)
Present (2025)	54	5.96
10 year (2035)	60	6.71
20 year (2045)	64	7.12

(1) There are 9 nodes in the modeled system.



MASON COUNTY PUD 1

WONDERLAND WATER SYSTEM PLAN

FIGURE 3-1

HYDRAULIC MODEL ID MAP

Gray & Osborne, Inc.
CONSULTING ENGINEERS

Model Calibration

Due to the small size and simplicity of the system, model calibration was not deemed critical. Without fire hydrants there is no way to flow test the system for calibration.

Peak Hour Demand Modeling Results

Pursuant to WAC 246-290-230 (5), a water system must maintain a minimum pressure of 30 psi in the distribution system under peak hour demand conditions. The PUD's existing distribution system was modeled under existing, 2035, and 2045 peak hour demand conditions. The full modeling results are included in Appendix G. A map of the of the 2045 PHD modeling results, are shown in Figures 3-2, respectively.

The model indicates that all nodes will have adequate pressure under each scenario. The lowest pressure projected by the model is 36.1 psi at Node J10 for the 20-year scenario. Table 3-17 shows the modeled results.

TABLE 3-17

Model Results

Junction ID	2025 PHD Modeled Pressure (psi)	2035 PHD Modeled Pressure (psi)	2045 PHD Modeled Pressure (psi)
J10	36.1	36.1	36.1
J12	45.3	45.3	45.2
J14	44.1	44.0	44.0
J16	47.4	47.3	47.2
J18	44.9	44.8	44.8
J20	51.3	51.2	51.1
J22	52.5	52.4	52.3
J24	53.6	53.5	53.4
J26	49.8	49.7	49.6

Distribution Improvements

No distribution system improvements are recommended based on the hydraulic modeling results. Though a general pipe replacement capital improvement project targeting leaking pipes is included in the Capital Improvement Program in Chapter 8.

Conclusions and Recommendations

The existing water mains and pumping systems are capable of meeting minimum system pressure standards at all locations under peak hour conditions for the 10- and 20-year projection scenarios.

ASSET MANAGEMENT PLAN

BACKGROUND

Asset management is defined by DOH as "… the practice of managing all utility assets to address the total cost of owning, operating, upgrading, and replacing them, while delivering the appropriate level of service." As part of this Water System Plan, the City has completed an Asset Management Plan. This Asset Management Plan includes an Asset Inventory, which summarizes the age, condition rating, replacement cost, and criticality of the City's major water system assets and relates these items to planned Capital Improvement Projects described in depth in Chapter 8. This inventory is used to assess the adequacy of the City's Capital Improvement Program to maintain current levels of service over the long term.

ASSUMPTIONS

The Condition Rating methodology used in preparing the City's Asset Management Plan is adapted from the document "Asset Management: The 5 Core Components" prepared by the Southwest Environmental Finance Center. The Condition Rating system used is summarized in Table 3-18.

TABLE 3-18

Asset Condition Rating System

Rank	Condition	Description
A	Excellent	Asset is new or nearly new; asset has no known or suspected condition issues
B	Very Good	Asset has no known or suspected condition issues, but is no longer a new asset
C	Good	Asset has few known or suspected issues
D	Average	Asset has known or suspected issues
E	Fair	Asset has known or suspected issues that may impact the asset's ability to continue to perform in the next several years
F	Poor	Asset has known or suspected condition issues and they are likely to impact the asset's ability to function in the near future (1 to 2 years)

PRESSURE

- 36 - 50 psi
- > 50 psi

Facility

- Well
- Pipe
- Highway
- Water Service Area & Retail Service Area
- Parcels
- Surface Water

N

0 625 1,250 2,500 Feet

MASON COUNTY PUD 1

WONDERLAND WATER SYSTEM PLAN

FIGURE 3-2

2045 PHD MODEL RESULTS

Gray & Osborne, Inc.
CONSULTING ENGINEERS

Each asset is assigned a Consequence of Failure (CoF) and a Likelihood of Failure (LoF) on a scale of 1 to 5 in accordance with the rating system shown in Table 3-19. The Criticality of each asset is defined as the product of the CoF rating and the LoF rating, with the lowest possible Criticality being 1 (1 x 1 = 1) and the highest possible Criticality being 25 (5 x 5 = 25).

TABLE 3-19

Asset Condition Rating System

Rank	Description
1	Very Low
2	Low
3	Moderate
4	High
5	Very High

ASSET INVENTORY

The Asset Inventory is shown in Table 3-20. The inventory includes all major components of the water system.

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TABLE 3-20

Wonderland Asset Inventory

No.	Asset	Asset Description	Asset Type	Asset Location	Year Installed	Age (years)	Expected Useful Life (years)	Remaining Useful Life (years)	Condition Rating	CoF	LoF	Criticality	Related Capital Improvement Projects	Replacement Cost ($2025)[(1)]	Annualized Replacement Cost ($2025)
1	Well 1	217-feet deep 8-inch-diameter well	Well	Wonderland Water Service Area	1973	52	100	48	C	5	1	5	BP-1, TF-1, TF-2	$300,000	$3,000
2	Well 1 Pumps	Two, 48-gpm well pump, 5-horsepower 3-phase submersible pumps	Well Pumping Facilities	Wonderland Water Service Area	2000	25	25	0	C	4	2	8	BP-1,	$125,000	$5,000
3	Well 1 Bladder Tanks	Eight, 119-gallon bladder tanks	Pressure Tank	Wonderland Water Service Area	2020	5	8	3	A	3	3	9	R-1	$40,000	$5,000
5	Well 1 Wellhouse	8 ft x 16 ft wood frame, T1-11 siding, metal roof building	Building	Wonderland Water Service Area	2020	5	40	35	A	2	3	6	BP-1, TF-1, TF-2	$77,000	$1,925
6	Water Main and Appurtenances, Polyvinyl Chloride (PVC)	Approximately 2,430 linear feet of 4-inch PVC water main and appurtenances	Water Main	Wonderland Water Service Area	1973 to Present	Varies	75	Varies	C	3	2	6	D-1	$300,000	$4,000
7	Water Service Connections	34 service connections	Water Services	Wonderland Water Service Area	1973 to Present	Varies	75	Varies	C	1	2	2	D-1	$51,000	$680
8	Water Service Meters	34 service meters	Water Meters	Wonderland Water Service Area		Varies	20	Varies	C	2	2	4	-	$51,000	$2,550
9	Valves	Seven 4-in gate valves	Gate Valves	Wonderland Water Service Area	1973 to Present	Varies	20	Varies	C	3	2	6	D-1	$11,000	$550
10	Blowoff Valves	2	Blowoff Assembly	Wonderland Water Service Area	2006	19	20	1	C	1	2	2	D-1	$6,000	$300
11	Source Meter	One source meter (2”) located at Well 1 Wellhouse	Source Meter	Wonderland Water Service Area	2020	5	20	15	F	1	5	5	SO-1	$5,000	$250
12	Backup Generator w/ATS	Generator (24kW) with four 120-gallon propane Tanks located at Well 1 Well House	Generator	Wonderland Water Service Area	2021	4	30	26	A	5	2	10	BP-1, TF-1, TF-2	$110,000	$3,667
Total														**$1,076,000**	**$26,922**

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WATER SYSTEM CAPACITY LIMITS

Water System Component Capacities were determined using characteristic ERU_{ADD}, ERU_{MDD}, or ERU_{PHD}. ERU_{PHD} refers to the PHD of single ERU and was determined to be 1.5 gpm. Table 3-21 summarizes the system capacity analysis.

TABLE 3-21

ERU Capacity Analysis Summary

Characteristic Demand Parameters			
ERU_{ADD}			202 gpd/ERU
ERU_{MDD}			617 gpd/ERU
ERU_{PHD}			1.5 gpm/ERU
2024 Demand Summary			
Service Classification	**Consumption, gpd**	**Total # Connections**	**ERUs**
Residential			
Single-Family(1)	8,343	34	34
DSL(2)	2,753	N/A	15
Total	**11,096**	**34**	**49**
Service Capacity as ERUs and Gallons Per Day			
Water System Component/Facility	**Capacity**		**ERU Capacity**
20-Hour Source Capacity	115,200 gpd		187(4)
Peak Hour Demand Capacity	96 gpm		64(6)
Water Rights (Qa)	107,129 gpd		530(5)
Water Rights (Qi)	144,000 gpd		233(4)
Water Rights (Qi)	100 gpm		67(6)
Water System's Service Capacity (ERUs)			**64**
Estimated ERUs for 2035(3)(5)			**53**
Estimated ERUs for 2045(3)(5)			**57**
Buildout(5)			**112**

(1) From Table 2-3.
(2) From Table 2-7.
(3) From Table 2-8.
(4) Derived using ERU_{MDD}.
(5) Derived using ERU_{ADD}.
(6) Derived using ERU_{PHD}.

The peak hour demand source capacity is 64 ERUs and is the limiting factor for the system. However, if storage and a booster pump station were to be added, the system will no longer be limited by the source and water right ability to meet peak hour demand, but instead would be limited by the same components' ability to meet max day demand, raising the system's ERU capacity well above the projected buildout.

There is enough capacity in the current infrastructure to provide service through the estimated 10-year, 20-year.

SUMMARY OF SYSTEM DEFICIENCIES

Based on the system analysis, the following deficiencies were identified:

1. Manganese in the source water is above the secondary MCL. The PUD intends to install a treatment system to address these issues.

2. The PUD has not yet completed a lead service line inventory and will complete and submit to be in compliance with the Revised Lead and Copper Rule.

3. The system currently is not required to provide storage; however, the PUD has indicated that it may construct storage in the future. Sizing requirements are discussed within the storage section of this chapter. Projects costs are summarized in Capital Improvement Program (Chapter 8).

4. In the event a reservoir is constructed a booster pump station will be required to pressurize the system. Projects costs are summarized in Capital Improvement Program (Chapter 8).

CHAPTER 4

WATER USE EFFICIENCY PROGRAM

OBJECTIVE

The objectives of this chapter are to identify the conservation and water use efficiency requirements pertaining to the Wonderland Water System, evaluate past conservation efforts, and describe the Wonderland Water System's water use efficiency plan for the next 10 years.

WATER USE EFFICIENCY PLANNING REQUIREMENTS

The Washington Legislature passed the Water Use Efficiency Act of 1989 (43.20.230 RCW), which directs the Department of Health (DOH) to develop procedures and guidelines relating to water use efficiency.

In 2003, the Municipal Water Supply - Efficiency Requirements Act (Municipal Water Law) was passed and amended RCW 90.46 to require additional conservation measures. The Municipal Water Law directed DOH to develop the Water Use Efficiency (WUE) Rule, which was adopted in October 2006. The WUE Rule is outlined in the *Water Use Efficiency Guidebook* (Third Edition), which was most recently revised in May 2025.

These documents provide guidelines and requirements regarding the development and implementation of conservation and efficiency programs for public water systems. Conservation and efficiency programs developed in compliance with these documents are required by DOH as part of water system planning documents, and by the Washington State Department of Ecology (Ecology) as part of an application for water rights. Conservation must be evaluated and implemented as an alternate source of supply before state agencies approve applications for new or expanded water rights.

Conservation can be used effectively to help meet increased demand for water, to protect the environment, to delay the development of costly infrastructure, and to ensure that water is available to meet economic and population growth consistent with the Growth Management Act by using existing supplies more efficiently. Public awareness and participation are necessary for the PUD to develop an active and beneficial conservation plan.

The fourth and most recent edition of the WUE Guidebook was released in May 2025. The WUE Rule sets stringent requirements for public water purveyors. The WUE Rule is comprised of the following six sections:

1. WUE Requirements
2. Water Metering
3. Data Collection
4. Distribution System Leakage (DSL)
5. Water Demand Forecasting
6. WUE Goals
7. WUE Measures

WATER USE EFFICIENCY REQUIREMENTS

The WUE Guidebook establishes various implementation and evaluation requirements for municipal water suppliers (MWS). The requirements focus on the importance of measuring water usage and evaluating the effectiveness of the WUE program. The Rule outlines three fundamental elements which include planning, DSL standards, and goal setting and performance reporting.

Table 4-1 provides a summary of the WUE Rule requirements applicable to the Wonderland Water System.

TABLE 4-1

Summary of WUE Requirements

Requirement	Compliance
Include WUE Program in Planning Documents	✓
Set WUE Goals	✓
Submit Service Meter Installation Schedule	✓
Submit First Annual Performance Report	✓
Meet DSL Standard (based on 3-year rolling average)	
Complete Installation of All Service Meters	✓

The system meets five out of six requirements in Table 4-1.

WATER METERING

The WUE Rule requires all sources and customer service connections be metered by January 22, 2017. The Wonderland Water System currently meters all sources, and all customers, and implements a water meter replacement program to assure meter accuracy. No further action is required to comply with this requirement. To note, the source meter currently does not provide accurate readings and is planned to be replaced.

WATER USE DATA COLLECTION AND REPORTING

The WUE Rule requires regular collection of production and consumption data. Data must be reported in the PUD's planning documents and annual performance report to DOH. Water use data will be used for the following:

- Calculating leakage;
- Forecasting demand for future water needs;
- Identifying areas for more efficient water use;
- Evaluating the success of your WUE program;
- Describing water supply characteristics;
- Aiding in decision-making about water management.

Table 4-2 summarizes the water use data collection requirements.

TABLE 4-2

Summary of Water Use Data Collection

Data Type	Unit of Measure	Collection Frequency	Comments
Water Production	Gallons	Monthly	Total by month and by year.
Water Sold	Gallons	Billing Period	Total sold by customer class for each billing period.
Distribution System Leakage	Gallons	Billing Period	The difference between monthly Water Production and monthly Accounted-for Water.
Percent Distribution System Leakage	Percent	Billing Period	Calculated for each billing period and for each year. If the 3-year running average exceeds 10 percent, further actions are required to reduce distribution system leakage.

DISTRIBUTION SYSTEM LEAKAGE STANDARD

The WUE Rule requires that water distribution systems maintain a DSL rate of less than 10 percent of finished water production based on a 3-year rolling average. DSL is defined as the difference between the total water production and authorized consumption. Authorized consumption includes metered water consumption by customers and known or credibly estimated uses that were unbilled or unmetered. Unmetered uses typically include cleaning reservoirs, flushing mains, and fire flows. DSL is typically attributed to water loss due to leaks or unauthorized uses such as illegal service connections, accounting errors, inaccurate source and customer meters, and water leaving the system for any unmetered use. DSL for 2018 through 2024 is summarized in Table 4-3.

TABLE 4-3

Distribution System Leakage

Year	Total Production (gal/yr)	Total Consumption (gal/yr)	DSL (gal)	DSL%	3-year Rolling Average DSL[2]
2018	2,420,476	1,830,491	589,986	24%	
2019	2,537,665	1,905,754	631,910	25%	
2020	2,853,646	2,218,388	635,257	-	-
2021	3,200,012	2,406,024	793,988	-	-
2022	2,895,641	2,177,174	718,467	-	-
2023	3,058,795	2,299,846	758,949	-	-
2024	4,061,106	3,053,463	1,007,643	-	-
Average(1)	**2,479,071**	**1,868,122**	**610,948**	**25%**	**-**

(1) The average reported is for years 2018 to 2019.

As shown in Table 2-7, the Wonderland Water System can only report DSL for 2018 and 2019 as these were the only years where accurate production meter data are available. As a result, the DSL average data is that of 2018 and 2019.

As previously mentioned, the WUE rule requires that systems maintain a 3-year running average DSL rate of 10 percent or less. As there is not enough data to calculate the 3-year running average DSL it will be assumed to be the average of the years reported. Thus, the estimated DSL at Wonderland is 25 percent and above the 10 percent or less requirement. Additional leak detection measures are necessary at this time. The PUD will continue working on leak detection to maintain DSL below 10 percent.

WATER DEMAND FORECASTING

The water demand forecast is presented in Table 2-8 and is based on historic water use data and anticipated population growth. A detailed discussion of demand forecast assumptions and parameters can be found in Chapter 2. These forecasted values will be compared to a similar forecast in which the Wonderland Water System meets new conservation goals in Table 4-5.

WATER USE EFFICIENCY GOALS

The WUE Rule requires that water conservation goals must include a measurable outcome, address water supply and/or demand characteristics, and include an implementation schedule. The goal setting process must be held through a public forum and be re-evaluated every 6 years. The WUE Rule requires that the "governing body of the public water system shall establish water use efficiency goals within 1 year of the

effective date of this rule." The WUE Rule further requires that WUE Goals must "be set in a public forum that provides opportunity for consumers and the public to participate and comment on the water use efficiency goals." Documentation of the public meeting and adoption of the updated WUE goals, which is detailed later in this section and can be found in Appendix H.

PREVIOUS WUE GOALS

Past WUE goals were established in 2018 prior to Mason County PUD 1's acquisition of the Wonderland Water System. The goals targeted a reduction in peak summer demand as daily production readings are not recorded and the source meter does not read accurately, thus it is not possible to evaluate these goals.

UPDATED WUE GOALS

Under the WUE Rule, the PUD must outline new water use efficiency goals as part of the WSP update, adopt these goals through a public process, and measure progress towards these goals each year. These goals must include a measurable outcome, and address water demand and supply characteristics. The PUD will continue to strive for the same goals as in the previous WSP in an effort to continue to reduce demand and maintain an acceptable DSL rate. Water use efficiency goals are addressed in the *Mason County PUD 1 Part A Water System Plan* and presented below.

Water use efficiency goals were established for all Group A community water systems and even the Group A non-community systems. The water systems were categorized by distribution system leakage and sets of goals were established for each category. The goals were approved by the PUD's Board of Commissioners in September 2024. A copy of the meeting minutes and details of the WUE goals are included in Appendix H.

- Group 1 – Systems with 10 percent or less distribution system leakage (DSL)
- Group 2 – Systems with >10 – 20 percent DSL
- **Group 3 – Systems with >20 – 30 percent DSL**
- Group 4 – Systems with >30 – 40 percent DSL
- Group 5 – Systems with >40 – 50 percent DSL
- Group 6 - Systems with >50 percent DSL

The Wonderland Water System falls under Group 3 with specific goals.

Consumption

- Goal 1: Reduce ADD by a minimum of 1 percent in 6 years.
- Goal 2: Reduce summer peak daily demand by 2 percent in 6 years.

Production

- Goal 1: Reduce DSL to 15 percent in 6 years.
- Goal 2: Reduce DSL to 10 percent in 12 years.
- Goal 3: Reduce total annual water production by 1 percent in 6 years.
- Goal 4: Reduce peak month production by 2 percent per ERU in 6 years.

Measures

- Develop "Water Loss Control Action Plan."
- Conduct an AWWA water audit.
- Identify and repair Leaks as soon as they are discovered.
- Educate all consumers about irrigation conservation and peak water demand twice a year.
- Conservation rate structure for all consumers.
- Consumption history shown on all water bills.
- Water conservation and landscape water use part of the water policy.
- Water conservation information on the MCPUD1 Website.

1. Consumption Goals: Consumption Goal 1 can be achieved by reducing the average day consumption per ERU (ERU_{ADD}) by 1.5 percent per year for the next 10 years. However, daily meter read data is unavailable and cannot be quantified and evaluated for Consumption Goal 2. Table 4-4 shows the impact of meeting the reduced consumption goal.

TABLE 4-4

Water Savings with Consumption Goal

Year	Projected ERUs (Excluding DSL)[1]	No Conservation		Conservation		Annual Water Savings (MG/Y)
		ERU_{ADD}[2]	Average Daily Consumption (gal/yr)	ERU_{ADD}	Average Daily Consumption (gal/yr)	
2025	34	183	2,268,105	183	2,268,105	0
2026	37		2,438,301	180	2,401,727	36,575
2027	37		2,462,335	177	2,389,019	73,316
2028	37		2,486,240	175	2,376,029	110,211
2029	38		2,509,917	172	2,362,677	147,240
2030	38		2,533,012	169	2,348,651	184,361
2031	38		2,556,010	167	2,334,425	221,585
2032	39		2,578,748	164	2,319,864	258,884
2033	39		2,601,195	162	2,304,956	296,238
2034	39		2,623,415	160	2,289,776	333,639
2035	40		2,645,020	157	2,274,004	371,016
Total Estimated 10-Year Water Savings						**2,033,065**

(1) From Table 2-8.
(2) From Table 2-5.

Production Goals: Production Goals 1 through 3 can be achieved by reducing the volume of DSL by 11 percent per year. However, daily meter read data is unavailable and cannot be quantified and evaluated for Production Goal 4. Table 4-5 shows the impact of meeting the combined production and consumption goals in terms of water savings.

TABLE 4-5

Total Water Savings – Consumption and Production Goals

Year	Average Daily Consumption w/o Conservation (gal/yr)	Average Daily Consumption w/Conservation (gal/yr)	DSL w/o WUE Goals (gal/yr)	DSL w/WUE Goals (gal/yr)		Average Daily Consumption and DSL w/o WUE Goals (gal/yr)	Average Daily Consumption and DSL w/WUE Goals (gal/yr)	Annual Water Savings (gal/yr)
				(gal/yr)	(%)			
2025	2,268,105	2,268,105		733,743	25%	3,001,848	3,001,848	0
2026	2,438,301	2,401,727		653,031	22%	3,172,044	3,054,758	117,286
2027	2,462,335	2,389,019		581,198	20%	3,196,078	2,970,217	225,861
2028	2,486,240	2,376,029		517,266	18%	3,219,983	2,893,295	326,688
2029	2,509,917	2,362,677		460,367	17%	3,243,660	2,823,044	420,617
2030	2,533,012	2,348,651	733,743	409,726	15%	3,266,755	2,758,377	508,378
2031	2,556,010	2,334,425		364,657	14%	3,289,753	2,699,081	590,671
2032	2,578,748	2,319,864		324,544	13%	3,312,491	2,644,408	668,083
2033	2,601,195	2,304,956		288,844	11%	3,334,938	2,593,801	741,137
2034	2,623,415	2,289,776		257,072	10%	3,357,158	2,546,848	810,310
2035	2,645,020	2,274,004		228,794	9%	3,378,763	2,502,798	875,965
Total								**5,284,996**

Both goals were implemented as of the date noted in the PUD's adoption ordinance as detailed in Appendix H.

WATER USE EFFICIENCY MEASURES

Given that Wonderland has less than 500 connections, only one WUE measure is required to be implemented. The District has chosen to implement the following the WUE Measures for the Wonderland Water System:

MANDATORY MEASURES

All water systems must implement and evaluate the following WUE actions, which cannot count towards the required number of measures.

- Install production (source) meters;
- Install consumption (service) meters;
- Perform meter calibration;
- Implement a water loss control action plan to control leakage;
- Educate customers about how they can use water efficiently at least once per year;
- Evaluate rates that encourage water demand efficiency.

The Wonderland Water System has enacted all the mandatory measures listed above.

SUPPLEMENTAL MEASURES

Implement a Conservation Rate Structure

The Wonderland Water System is fully metered and the PUD has implemented a conservation rate structure for the system. The rate structure is discussed in detail in Chapter 9.

PERFORMANCE REPORTING

The PUD must submit a performance report to DOH by July 1 each year. The WUE reporting is completed by Water and Wastewater Services. This annual report must include:

- Total source production and customer consumption;

- Distribution system leakage in percentage and volume; and

- Description of current WUE goals, schedule and progress towards meeting goals.

DOH has developed an online reporting form that must be used by water systems to file their annual report. Previous year's WUE annual performance reports are also available on the DOH website.

WATER LOSS CONTROL ACTION PLAN

The current average DSL is 25 percent, well above the distribution system leakage standard of 10 percent. As a result, the PUD must implement a Water Loss Control Action Plan (WLCAP). The following elements are included in the WLCAP:

- The PUD will work to aggressively minimize DSL and reach the goals outlined in Table 4-5.

- The PUD will replace the source meter.

- The Town's Capital Improvement Program (CIP), which is detailed in Chapter 8, shows that the PUD will conduct leak detection every two years. This work will be explicitly called out as a line item in the financial forecast in Chapter 9.

- There are no anticipated technical or financial concerns that could prevent the Town from complying with the standard.

FIELD ACTIVITIES TO REDUCE LEAKAGE

The PUD will complete leak detection every two years, when there is a large increase in DSL, or in the event production meter readings expectedly increase. The PUD will prioritize the replacement of aging water mains with frequent leaks or breaks.

CHAPTER 5

SOURCE WATER PROTECTION

Water from underground aquifers, commonly referred to as groundwater, forms the primary source of drinking water for approximately 65 percent of Washington State residents. The Wonderland Water System relies on one groundwater source, Well 1 (Water Right Number G2-20470C) to meet its water supply needs. The location of this well is shown on Figure 1-3.

To protect groundwater supplies, the Environmental Protection Agency (EPA) and Washington Department of Health (DOH) require public water utilities to develop a wellhead protection program as a component of its Water System Plan. The purpose of a wellhead protection program is to provide local utilities with a proactive program for preventing groundwater contamination. The minimum requirements for a wellhead protection plan are specified in WAC 246-290-135(3).

WELLHEAD PROTECTION PROGRAM

A successful wellhead protection program consists of a number of elements that must be developed before the plan can be fully implemented. These elements are described below and form the basis of this chapter.

- *A Description of the Geology* of the area, describing the ground water source and any natural protection provided by geologic structures.
- A *Susceptibility Assessment* that determines the susceptibility of each source of contamination.
- A *Delineated Wellhead Protection Area* (WPA) based on all reasonable available hydrogeologic information, inclusive of the Susceptibility Assessment.
- An *Inventory* of potential sources of contamination within each wellhead protection area.
- A *Spill Response Plan* for each wellhead protection area containing documentation for coordination with local first responders.
- A *Contingency Plan* for providing alternate sources of drinking water in the event that contamination does occur and management recommendations to reduce the likelihood those potential contamination sources will pollute the drinking water supply.

GEOLOGY

According to Washington State Department of Natural Resources Geologic Map DAS_1 Pleistocene continental glacial drift (2021), Wonderland is located south of the Puget Lowland. The Puget Lowland region is a wide low-lying area between the Cascade Range to the east and the Olympic mountains to the west. The region extends from the San Juan Islands in the north to past the southern end of the Puget sound. This region was repeatedly shaped by glacial and nonglacial sedimentation and erosion during the Pleistocene epoch so the most widespread geological units are sediment deposits. The geology of the area is Pleistocene till and outwash clay, silt, sand, gravel, cobbles, and boulders deposited by or originating from continental glaciers; with other local deposits that include peat, nonglacial sediments, modified land, and artificial fill. The principle natural resource is sand and gravel aggregate left behind by the glaciers. Gravel pits provide critical raw construction resources to the area.

The well log for Well 1 shows the drilling method for the well as cable-tool. It also describes the soil as clay, sand with some gravel, and conglomerate.

SUSCEPTIBILITY ASSESSMENT

Susceptibility assessment for the Wonderland Water System well was completed and a copy is included in Appendix I. Drinking water supplies vary in their susceptibility to contaminants discharged at the surface. Wells that have been poorly constructed or have been improperly cased have an increased susceptibility. Additionally, wells located in an aquifer with no confining layer (layer of low permeability) between the aquifer and surface have a higher susceptibility than those drawing water from confined aquifers deep below the ground surface.

Susceptibility assessment has not been reviewed by the Department of Health; therefore, no susceptibility rating has been determined.

WELLHEAD PROTECTION AREA DELINEATIONS

In developing a wellhead protection program a first step is to establish the land areas around each well from which groundwater may flow to the well. These areas are likely to contribute pollutants to the groundwater and are referred to as “zones of contribution” (ZOC). The six month, one-year, five-year, and ten-year ZOCs combined constitute the Wellhead Protection Area (WHPA) for each well. WHPAs require appropriate land use management to minimize the possibility of contaminants affecting ground water sources. The most commonly accepted tools for delineating ZOCs are the calculated fixed radius method, analytical models, and numerical models. These methods are discussed below. The Calculated Fixed Radius Method will be used to determine the WHPA.

METHODS OF DELINEATION

Calculated Fixed Radius Method

The simplest ground water model is the Calculated Fixed Radius (CFR) method. In this method, ZOCs are delineated by concentric areas around each well, usually 100 feet or more. In the Calculated Fixed Radius method, the delineations are calculated based on pumping data and known or assumed aquifer characteristics. This method is the minimum acceptable interim method of delineation for public water systems. The CFR method estimates time of travel distance to a well by the following equation:

$$r = \sqrt{\frac{Qt}{\pi n H}}$$

Where:

Q = Pumping Rate of Well in Cubic Feet per Year
n = Aquifer Porosity, assumed to be 0.26, based on average porosity of clayey sands.
H = Open interval or length of well screen.
t = Travel Time to well in years.

Analytical Models

The analytical model requires the incorporation of basic hydrological information and certain physical characteristics of the aquifer and well. Major assumptions and simplifications to the hydrogeologic regime occur in analytical modeling, but the incorporation of the hydraulic gradient and hydrogeologic boundaries allows for a more realistic representation of the ground water flow regime than in the calculated fixed radius method.

Numeric Method

The Numeric method requires significantly more data. In numeric modeling, a grid is superimposed over the study area. Each square in the grid, called a cell, is characterized by physical parameters, which are estimated from data collected from a variety of sources. The sources may include well logs, geologic and hydrogeologic maps, geophysical data, ground water elevation data, stream flow discharge and meteorological data.

The Numeric method generates more accurate results than the Fixed Radius or Analytical methods. However, Numeric models are very costly to develop. Consequently, Numeric models are more commonly used by large utilities with complex aquifers who have the resources to collect the extensive model input required.

Since the Wonderland system is a small system with only one well, the CFR method is the most appropriate method to determine ZOCs.

ANALYSIS

The CFR Method was used to estimate the 6-month, 1-year, 5-year, and 10-year ZOCs for Wonderland Water System's WHPAs. The ZOCs were calculated using the equation provided in the DOH's Wellhead Protection Program Guidance Document. The annual pumping rates used to calculate the ZOCs are based on the 2024 total annual production from Table 2-1 of 4,061,106 gallons. The well has a screened interval of 5 feet which can be found in the well log in Appendix B. Table 5-1 shows the 6-month to 10-year ZOCs determined using the CFR Method.

TABLE 5-1

Wonderland System Wellhead Protection Zones of Contribution

Parameter	Well 1 ZOC (ft)
6-Month Time of Travel	258
1-Year Time of Travel	365
5-Year Time of Travel	815
10-Year Time of Travel	1,153

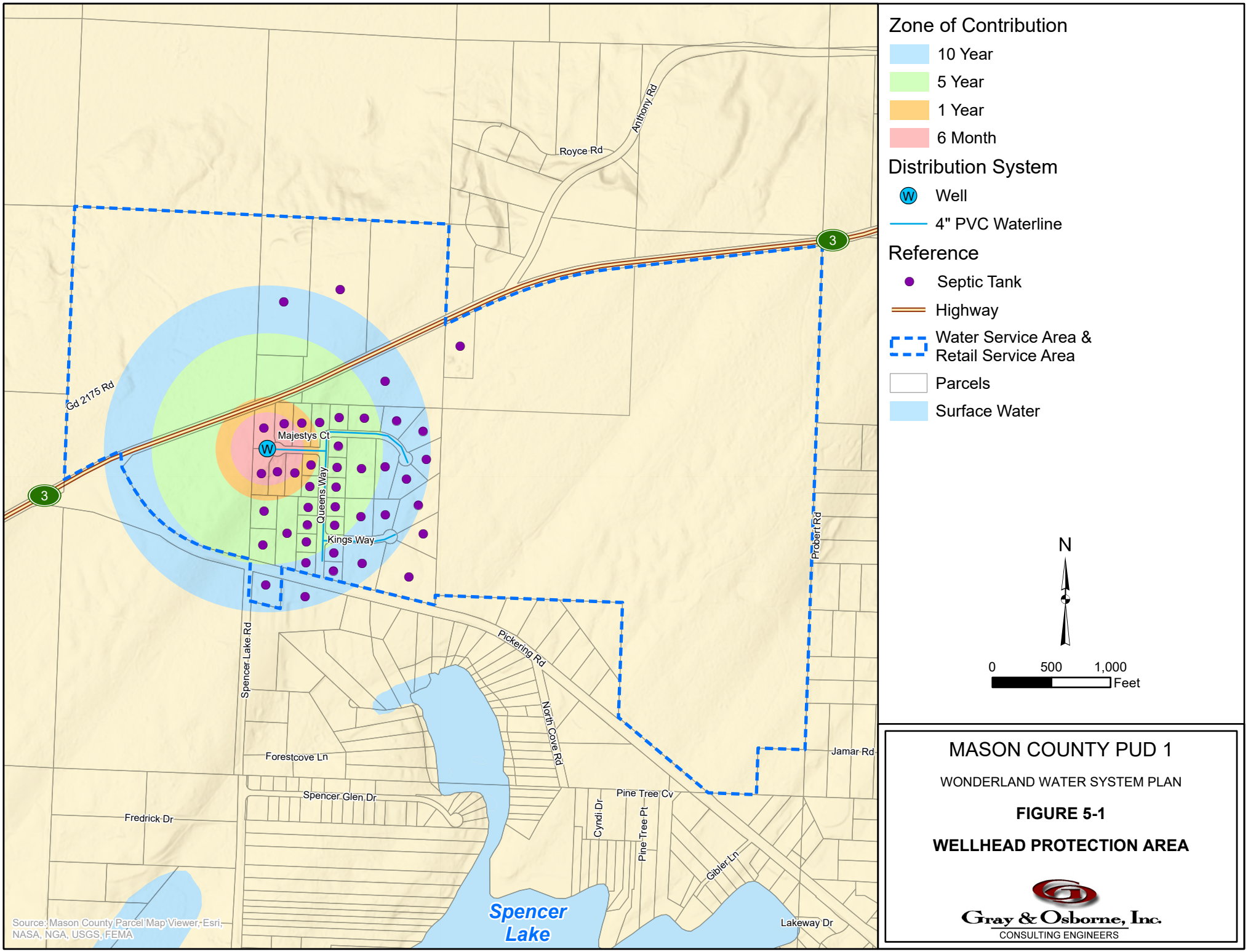
The Wellhead Protection Area for Wonderland Water System is shown in Figure 5-1.

INVENTORY OF POTENTIAL CONTAMINANT SOURCES

An essential element of wellhead protection is an inventory of all potential sources of groundwater contamination in and around the delineated wellhead protection areas. The purpose of the inventory is to identify past, present, and proposed activities that may pose a threat to a water supply source.

Inventory Data Sources

The Washington Department of Ecology Facilities Site Atlas was used to identify any known potential sources of contamination in the wellhead protection areas. The Facility/Site Atlas provides interactive mapping of Department of Ecology's regulated facilities and Washington Department of Health's regulated public water systems. This mapping application was designed to support drinking water source protection by providing public access to information showing the proximity of public drinking water sources to regulated facilities. The map can be accessed at the ecology facility/site search data website.



MASON COUNTY PUD 1

WONDERLAND WATER SYSTEM PLAN

FIGURE 5-1

WELLHEAD PROTECTION AREA

Gray & Osborne, Inc.
CONSULTING ENGINEERS

Department of Ecology's Fortress portal links the following databases:

- *Underground Storage Tank Program*, including records of registered underground storage tanks and underground storage tanks that are known to have leaked.
- *The Dangerous Waste and Materials Generators program*, including locations of registered dangerous waste and materials handlers.
- *Title III Hazardous Materials sites*, including locations of regulated facilities that treat, store or dispose of hazardous materials in sufficient quantity to pose a threat to the community.
- *Regulated Waste Dischargers.*
- *Confirmed and Suspected Contamination Sites.*

The Department of Ecology Facilities Sites website identified no regulated facilities within the wellhead protection area for the Wonderland Water System.

POTENTIAL CONTAMINANT SOURCES

Within a WHPA, there is a potential for many diverse activities that could contaminate an aquifer, thereby impacting the water supply. A discussion of these activities, their potential effects on ground water, and the regulatory requirements that may apply are included in the following sections.

Landfills

A landfill is a disposal facility in which solid waste is permanently placed. Minimum functional standards for solid waste hauling are regulated by the Washington State Department of Ecology under WAC 173-304. These regulations set siting and closure criteria, performance standards, and operating requirements for landfills. Abandoned and improperly maintained landfills and dumpsites are often a major source of ground water contamination. Leachate from landfills poses a threat to ground water quality should it migrate to the water table. The Department of Ecology is responsible for mitigating dumpsite cleanup when potentially hazardous leachates are present.

There are no known active landfills within the Wonderland Water System's WHPA.

Commercial and Industrial Activity

Areas of commercial and industrial land use may be located within WHPAs. Businesses that may contribute contaminants to the groundwater include dry cleaners, gas stations and other businesses with fuel storage tanks, auto repair shops, metal plating facilities,

asphalt and concrete facilities, and machine shops. Wastes generated at these businesses include substances such as petroleum products, solvents, surfactants, heavy metals, and other organic materials. These wastes can potentially enter the groundwater system through inadequate disposal practices or accidental spills. Table 5-2 presents typical commercial and industrial activities and the potentially hazardous chemicals that may be associated with them.

TABLE 5-2

Chemicals Associated with Commercial and Industrial Activities

Commercial/Industrial Activity	Contaminants
Automobile/Truck Service	Waste oils, solvents, acids, paints, soaps
Dry Cleaners	Solvents (perchloroethelyene, petroleum solvents, Freon) spotting chemicals (trichloroethane, methylchloroform, ammonia, peroxides, hydrochloric acid, rust removers, amyl acetate)
Cemeteries	Fertilizers, pesticides
Country Clubs/Golf Courses	Fertilizers, herbicides, pesticides, swimming pool chemicals, automotive wastes
Electric/Electronic Equipment Manufacturers	Nitric, hydrochloric and sulfuric acid, heavy metal sludges, ammonium persulfate, cutting oil and degreasing solvent, corrosive soldering flux, waste plating solution, cyanide, methylene chloride, perchloroetheylene, trichloroethane, acetone methanol
Furniture/Wood Manufacturing	Paints, solvents, degreasing and solvent recovery sludge
Metal Plating Shops	Sodium and hydrogen cyanide, metallic salts, alkaline solutions, acids, solvents, heavy metal contaminated wastewater/sludge
Lawns and Gardens	Fertilizers, herbicides, pesticides
Painters, Publishers	Solvents, inks, dyes, oils, miscellaneous organics, photographic chemicals
Sand and Gravel Mining	Diesel fuel, motor oil, hydraulic fluids
Scrap, Salvage and Junkyards	Used oil, gasoline, antifreeze, PCB contaminated oils, lead acid batteries

The siting and operation of facilities that treat, store, or dispose of hazardous waste are subject to the requirements of the Resource Conservation and Recovery Act (RCRA), Subtitle C. In Washington State, the Department of Ecology regulates facilities that generate more than 220 pounds of hazardous waste per month under WAC 173-303, Dangerous Waste Regulations. The regulations are significant in that they establish a

number of requirements for these facilities including surveillance and monitoring, record keeping, performance and design criteria, and siting and closure procedures. Ecology divides the facilities into three levels of hazardous waste accumulation: Large quantity generator (LQG) generate 2,200 pounds of waste per month or more; medium quantity generator (MQG)generates between 220 and 2,200 pounds per month; and small quantity generator (SQG) generate less than 200 pounds. SQGs are exempt from the regulations. If your site generates dangerous waste, you must determine your generator category each month. Your generator category tells you which dangerous waste rules to follow.

A summary of those activities is published by Ecology, thereby allowing water purveyors the opportunity to determine the types of activities present within their WHPA.

There are no known chemical or industrial sites in Wonderland Water System's WHPA. However, located near but not within the WHPA is Highway 3 Auto Wrecking that could be a potential contaminant source.

Underground Storage Tanks

Underground storage tanks (USTs) and leaking underground storage tanks (LUSTs) can be a major threat to ground water quality. Petroleum products, which typically contain components that are mobile in the ground water system, are the most commonly stored substances in USTs. The EPA has estimated that 35 percent of all USTs could be leaking. The most common causes of leaks are structural failure, corrosion, improper fittings, and improper installation.

Ecology regulates underground storage tanks in Washington State under WAC 173-360. The regulations require that owners and operators of underground storage tanks comply with the following sections of the regulations:

- Notification, reporting, and record keeping
- Performance standards and operating closure requirements
- Registration and licensing
- Financial responsibility

As of July 1, 1991, owners and operators of all existing non-exempt underground storage tanks were required to have a permit from Ecology. A valid permit is a requirement for delivery of regulated substances. The permit must be up to date annually.

Underground storage tank inspections are performed by Ecology primarily through the information developed in the permitting process. Ecology maintains a file on all permitted USTs in Washington State, as required by RCRA, Subtitle 1. The file provides the site name and address, tank identification number, date of installation, size, tank status, and the substance stored at the site.

There are no known underground storage tanks in the Wonderland Water System's WHPA.

SEPTIC SYSTEMS

Mason County is responsible for regulating and permitting residential and small commercial onsite sewage disposal systems within the county, excluding Federal facilities. Contaminants associated with septic tank effluent include pathogenic organisms, toxic substances, and nitrogen compounds. Ammonia and nitrate nitrogen are highly soluble in water.

All houses in the Wonderland Water System's WHPA have on-site septic systems.

ACCIDENTAL SPILLS AND LEAKS

Accidental spills or releases of contaminants can potentially impact ground water supplies. Potential sources of spills and leaks include underground storage tanks, accidents and poor disposal practices. Accidental spills are a concern along major public rights-of-way.

Highway 3 passes through the Wonderland Water System's WHPA, which could be a potential source of accidental spills.

Confirmed or Suspected Contamination Sites

Under the Model Toxics Control Act Cleanup, WAC 173-340, the Department of Ecology is responsible for ensuring all hazardous waste sites are properly remediated. This includes confirmed and suspected sites of contamination as well as LUSTs. A separate inventory for each, which includes the status of cleanup efforts, is maintained by Ecology. Ecology conducts an initial site investigation within 90 days of learning of a potentially contaminated site. If this investigation shows that remediation action is required, the site will appear on the Confirmed and Suspected Contaminated Sites Report. The sites are also given a Washington Ranking Mode BIN number between 1 and 5. A rank of 1 indicates the greatest assessed risk to human health and the environment. The contaminant type and the affected media, such as ground water, is also noted. Once the remedial action has been completed, Ecology's Toxics Cleanup Program determines if the site can be removed from the list.

There are no confirmed and suspected contaminated sites within the Wonderland Water System's WHPA.

SPILL/INCIDENT RESPONSE PROGRAM

Spill response planning is an important aspect of both an emergency management plan and a wellhead protection program. Specific response procedures for WHPAs must be determined prior to the occurrence of a contamination incident. The information obtained as a result of the susceptibility assessment and the WHPA inventory can be used to determine what types of spill response measures are necessary for the protection of drinking water sources. In order to be accepted by local emergency responders, spill response procedures for WHPAs should be realistic and easily implemented.

In order for spill response procedures to be effectively executed, coordination, cooperation, and communication among the responding agencies, organizations, and individuals is imperative. Depending on the magnitude and type of the release, any of the following organizations may be involved in a spill response for a WHPA in Washington State.

- *Department of Ecology (Ecology):* The Spill Response Team is responsible for determining the source and cause of the release, and responsible party. If the responsible party is unknown, Ecology will investigate to determine who is responsible and ensure that containment, clean up, and disposal proceedings begin. Ecology's 24-Hour Spill Response can be contacted at (360) 407-6300.

- *Department of Health (DOH):* The Department of Health is developing a set of standard operating procedures, in conjunction with organizations such as Ecology's Spill Operations Section and the Association of Fire Chiefs that first responders can use in WHPAs, critical aquifer recharge areas, and other sensitive ground water areas. DOH also provides assistance through laboratory support and services, if necessary, to the cleanup effort.

- *Fire Department*: Initial response to a hazardous spill will often be from the local Fire District, which is Central Mason County Fire. The Fire District should be notified of the WHPA boundaries.

- *Mason County Division of Emergency Management:* The Mason County Division of Emergency Management (DEM) is a division of the Mason County Department of Support Services. The DEM's Mission Statement is, "To endeavor to minimize the impacts of emergencies and disasters on the people, property, environment, and economy of Mason County and the region through preparedness, mitigation, response, and recovery." Mason County DEM's goals and objectives are stated as follows:

GOALS:

- *Through regional and local partnerships - strengthen the County's ability to readily, effectively, and efficiently mitigate against, prepare for, respond to, and recover from all types of natural and man-made emergencies/disasters including, but not limited to, earthquakes, windstorms, floods, wildland fires, acts of terrorism, and man-made/technological hazards.*

- *To develop and enhance regional partnerships that will enable the County to meet and/or exceed all statutory and regulatory requirements affecting emergency management operations.*

OBJECTIVES:

- *Provide support to County agencies, stakeholders, regional partners, and residents during disaster/emergency related events (natural, man-made, or technological)*

- *Provide oversight and management of emergency communications and operations.*

- *Provide training to County/City/Tribal government, agencies, businesses, schools, and private citizens.*

- *Develop, maintain and implement emergency plans*

- *Significantly expand public education and outreach program*

- *Develop and implement grants/contract management process to improve accountability*

- *Develop and conduct local and regional exercises*

CONTINGENCY PLANNING

Contingency planning is an important component of a wellhead protection program. In the event that any wells need to be taken offline due to contamination, a contingency plan provides immediate mitigation. Contingency planning also includes provision of alternative sources of drinking water. The following steps are necessary for the development of an effective contingency plan:

- Identify maximum capacities of the existing system as to source, distribution system and water rights restrictions. Assume loss of well and re-evaluate.

- Evaluate the expansion options of the existing system's capacities relative to existing water rights.
- Identify existing or potential interties with other public water systems.
- Evaluate current procedures and make recommendations on contingency plans for emergency events.

Since the Wonderland Water System does not have any adjacent water systems, if the Wonderland Well were to be contaminated, the District would likely need to haul water from other systems to serve customers while treatment facilities were installed or another well could be developed.

EXISITNG CAPACITY

The maximum capacity of the existing Wonderland Water System was discussed in Chapter 1 and evaluated in Chapter 3. As indicated in Table 3-14, the system has adequate source capacity to serve the Wonderland Water System. The Wonderland Water System area is rural and developed at a low density. Therefore, if a well should become contaminated there is most likely space available in the general area to drill a replacement well.

Water Rights

The Wonderland Water System water rights are discussed and evaluated in Chapter 3. As indicated in Table 3-13, the Well 1 annual and instantaneous water rights are adequate to serve the system. If a well becomes contaminated it may be possible to drill a replacement well under existing water right.

WELLHEAD PROTECTION ACTIONS

POTENTIAL CONTAMINANT SOURCES

Because the Wonderland Water System has no emergency interties, proactive implementation of this wellhead protection program is strongly recommended. The PUD should ensure that all property owners within the Wonderland Water System's WHPA are aware of the WHPA and the importance of protecting this resource. The PUD last sent letters in September 2025 to all customers notifying them that there are within the WHPA. Sample notification letters and addresses of parcels within the WHPA are included in Appendix L.

CONTINGENCY PLANNING

The following items are recommended contingency planning efforts the PUD will consider implementing.

- Develop emergency procedures for implementing water conservation measures should the Wonderland Water System well become contaminated.

- Identify the closest water purveyor that may be available to truck water from and research the availability of trucks that could be used for this purpose.

CHAPTER 6

OPERATION & MAINTENANCE PROGRAM

Water Distribution system operation and maintenance standards are addressed in the PUD Part A Water System Plan.

CHAPTER 7

CONSTRUCTION STANDARDS

Water Distribution system construction standards are addressed in the PUD Part A Water System Plan.

CHAPTER 8

CAPITAL IMPROVEMENT PROGRAM

OBJECTIVE

The objective of this chapter is to present the Mason County PUD No. 1 Capital Improvement Program for the Wonderland Water System. Improvements are assessed and prioritized for implementation over 10- and 20-year planning periods. The Capital Improvement Program has been developed in conjunction with the financial capabilities and recommendations presented in Chapter 9, Financial Program.

This chapter includes capital improvement projects that address distribution and transmission deficiencies, and other identified capital needs. The chapter identifies improvements, recommends a schedule for the improvements, and identifies available funding sources. Detailed cost estimates are included in Appendix J. All costs estimates include a 30 percent contingency, sales, and a 25 percent markup for engineering, permitting, and construction administration.

CAPITAL IMPROVEMENTS

This section addresses capital improvements, or improvements to physical facilities. These improvements address deficiencies noted in Chapter 3.

SO-1 – SOURCE METER REPLACEMENT
Project Cost: $10,000
Construction Year: 2026

The existing source meter is not functioning properly and will be replaced.

R-1 – RESERVOIR
Project Cost: $1,944,600 (R-1 and BP-1 Combined)
Construction Year: Beyond 2035

A new reservoir with a minimum capacity of 94,000 gallons is proposed to provide storage for the growth anticipated in a build-out scenario.

Concrete Baker Silo style reservoirs are available with diameters of 14, 20, 26, or 30 feet. In a full buildout scenario, a storage volume of 84,409 gallons would be required. Assuming a reservoir with a diameter of 20 feet and 40 feet tall would improve the Wonderland Water System reliability and capacity. The reservoir base is assumed to be located at an elevation of 240 feet. This project must be completed with project BP-1. The project cost estimated for both R-1 and BP-1 is $1,944,600.

BP-1 – BOOSTER PUMP STATION
Project Cost: $1,944,600 (R-1 and BP-1 Combined)
Construction Year: Beyond 2035

A new booster station would be designed to operate along with the proposed new reservoir. The booster station capacity would be sized to provide the projected 20-year peak hour demand. It is anticipated that the booster station will be included in the same building as a new treatment facility to remove iron and manganese from the well.

TF-1 – PILOT STUDY
Project Cost: $10,000
Construction Year: Beyond 2035

The PUD will contract with an iron and manganese filtration system manufacturer to complete a pilot study where water from the Wonderland well will be treated and analyzed on a small scale and a recommendation given for a large-scale treatment design.

TF-2 – TREATMENT FACILITY
Project Cost: $1,366,400
Construction Year: Beyond 2035

As noted in Chapter 3, iron and manganese is present in the source water. Table 3-5 shows that manganese levels since 2019 have either exceeded or been near the MCL of 0.05 mg/L. To improve water quality, the PUD intends to install a treatment system between the well and the new reservoir.

Using the pilot study results (completed as TF-1), the PUD will likely construct an oxidation/filtration system using sodium hypochlorite and pyrolusite filter media can effectively provide treatment of water from the Wonderland Well. The proposed treatment system will be housed in a new building with dimensions of approximately 24 feet by 16 feet which may be capable of housing the future pump station (BP-1).

D-1 – WICKED DELIGHTS WATER CONNECTION LINE
Project Cost: $281,100
Construction Year: 2026

Connect Wicked Delights Bakery Water System to Wonderland Water System by installing 530 lf of 4-inch PVC pipe. This project will be developer funded.

D-2 – LEAK DETECTION AND REPAIR
Project Cost: $5,000
Construction Year: Biannual through 2035

The PUD will conduct leak detection every two years and conduct repairs in-house as needed.

CAPITAL IMPROVEMENT SCHEDULE

10-Year Capital Improvements

An overall capital improvement schedule for the 10-year planning horizon is summarized in Table 8-1. The total estimated cost of all recommended capital improvements for the 10-year planning horizon is $35,000. Locations of capital improvements are shown in Figure 8-1.

TABLE 8-1

10-Year Capital Improvement Schedule

No.	Project Title	Description	Cost Estimate	Year
SO-1	Source	Source Meter Replacement	$10,000	2025
R-1	Reservoir	Build new concrete Mt Baker Silo style reservoir	$1,944,600	Beyond 2035
BP-1	Booster Pump Station	Install a new booster pump station		Beyond 2035
TF-1	Pilot Study	Treatment System Pilot Study	$10,000	Beyond 2035
TF-2	Treatment Facility	New treatment facility for iron and manganese	$1,366,400	Beyond 2035
D-1	Wicked Delights Water Connection Line	Connection of Wicked Delights Bakery to Wonderland Water System	$281,100(1)	2026
D-2	Leak Detection and Repair	Leak Detection and Repair	$5,000	Biannual through 2035
Total 10-Year Capital Improvements			**$35,000**	
Total Capital Improvements			**$3,356,000**	

(1) Paid for by Wicked Delights Bakery.

Capital Improvement Project
- Well
- Reservoir
- Booster Pump
- Water Main

Distribution System
- Meter
- Valve
- Well
- 4" PVC Waterline

Reference
- Highway
- Water Service Area & Retail Service Area
- Parcel
- Surface Water

N

0 500 1,000 Feet

MASON COUNTY PUD 1

WONDERLAND WATER SYSTEM PLAN

FIGURE 8-1

CAPITAL IMPROVEMENT PROJECTS

Gray & Osborne, Inc.
CONSULTING ENGINEERS

CHAPTER 9

FINANCIAL PROGRAM

OBJECTIVE

The Mason County PUD No. 1 owns and operates 74 separate water systems, including Wonderland Water System (Wonderland), as well as an electric utility. As such, any comprehensive financial planning for the PUD as a whole is beyond the scope of this Part B Water System Plan. The overall finances of the PUD water utilities are addressed in the PUD's Part A Water System Plan. This Part B Water System Plan will review Wonderland's historical revenue and expenses before projecting the future budget which will finance the proposed improvement schedule from Chapter 8.

RATE STRUCTURE

The rate schedule for all PUD water systems, effective January 2025, is included in Appendix K. System development fees for new water system connections are also listed in the rate schedule.

WATER SALES RATES AND REVENUE

All connections in the Wonderland Water System are metered. The current rate structure is an inclining block rate structure. Table 9-1 shows previous and current rates, indicating that they have raised in the past few years. The metered rates promote conservation as customers are charged more when they use more water. The charges per 100 CF for usage over the base amount are charged in blocks of 100 CF or a portion thereof. Therefore, for example, the charge in 2025 for any amount from 401 CF to 500 CF is the base amount of $65.63 per month plus a single over charge of $2.64, for a total monthly fee of $68.27.

TABLE 9-1

Metered Rate Schedule

Tier	Rates			
	2022	2023	2024	2025
Base Rate, 0-400 CF	$56.95	$59.75	$62.63	$65.63
Unit Rate per 100 CF (401 – 1,000 CF)	$2.29	$2.40	$2.52	$2.64
Unit Rate per 100 CF (1,001 cf and above)	$2.85	$2.99	$3.13	$3.29

At the average day demand of 202 gpd per ERU the average monthly usage rate is 821 CF per month. The average monthly bill for 2025 would then be the base amount of $65.63 plus the charge for the remaining 421 CF, for a total of $76.19.

CURRENT PUD WATER SYSTEMS BUDGET

Table 9-2 shows historical water utility revenues and expenditures for 2024. Expenditure and revenue totals include money from the water fund and water capital improvement fund. In all years, water utility revenues are balanced with expenditures.

TABLE 9-2

Wonderland Historical Water Utility Revenues and Expenses

	2020	2021	2022	2023	2024
Starting Balance	$0	$7,993	$14,951	$21,350	$30,768
Revenues					
Water Rates	$23,609	$25,773	$26,755	$28,608	$32,216
Total Revenues	**$23,609**	**$25,773**	**$26,755**	**$28,608**	**$32,216**
Expenses					
Salaries and Other Benefits	$4,400	$5,986	$7,153	$6,789	$6,264
Power and Other Utilities	$1,355	$1,390	$1,633	$1,520	$1,577
Material Supply and Parts	$2,100	$2,200	$2,300	$2,400	$2,500
Transportation Expenses	$420	$440	$460	$480	$500
Misc. Expenses	$860	$900	$940	$980	$1,000
Total O&M Expenses	$9,135	$10,916	$12,486	$12,169	$11,841
General and Admin. Expenses	$0	$0	$0	$0	$0
Salaries and Benefits	$3,530	$3,313	$3,274	$3,566	$3,703
Office Supplies and Postage	$63	$66	$69	$72	$75
Insurance – All	$420	$440	$460	$480	$500
Legal and Accounting	$420	$440	$460	$480	$500
Engineering and Professional	$840	$880	$920	$960	$1,000
Misc. Expenses	$21	$22	$23	$24	$25
Total Expenses	**$14,429**	**$16,077**	**$17,692**	**$17,751**	**$17,644**
Taxes and Interest	$1,187	$1,296	$1,346	$1,439	$1,620
Capital Improvement Program	$0	$1,442	$1,318	$0	$0
Loan and Bond Funds	$0	$0	$0	$0	$0
Net CIP	$0	$1,442	$1,318	$0	$0
Total Revenue Required	**$15,616**	**$18,815**	**$20,356**	**$19,190**	**$19,264**
Budget Surplus	**$7,993**	**$6,958**	**$6,399**	**$9,418**	**$12,951**

WATER UTILITY FINANCIAL ANALYSIS

FUTURE REVENUES AND EXPENDITURES

Future water utility's projected revenues and expenditures for 2025 through 2035 are summarized in Table 9-3 and were provided by the District.

TABLE 9-3

Projected Revenues and Expenses Summary

	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
Starting Balance	$12,951	$13,377	$3,802	$9,564	$15,360	$11,190	$16,653	$12,108	$17,552	$12,982	$18,392
Revenues											
Water Rates	$33,826	$35,518	$37,649	$39,908	$42,302	$44,417	$46,638	$48,970	$51,418	$53,989	$56,689
Total Revenues	**$33,826**	**$35,518**	**$37,649**	**$39,908**	**$42,302**	**$44,417**	**$46,638**	**$48,970**	**$51,418**	**$53,989**	**$56,689**
Expenses											
Salaries and Other Benefits	$6,765	$7,306	$7,891	$8,522	$9,204	$9,940	$10,735	$11,594	$12,522	$13,524	$14,605
Power and Other Utilities	$1,640	$1,706	$1,774	$1,845	$1,919	$1,995	$2,075	$2,158	$2,245	$2,334	$2,428
Material Supply and Parts	$2,600	$2,704	$2,812	$2,925	$3,042	$3,163	$3,290	$3,421	$3,558	$3,701	$3,849
Transportation Expenses	$520	$541	$562	$585	$608	$633	$658	$684	$712	$740	$770
Misc. Expenses	$1,040	$1,082	$1,125	$1,170	$1,217	$1,265	$1,316	$1,369	$1,423	$1,480	$1,539
Total O&M Expenses	**$12,565**	**$13,338**	**$14,164**	**$15,046**	**$15,989**	**$16,997**	**$18,074**	**$19,227**	**$20,460**	**$21,779**	**$23,191**
General and Admin. Expenses	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Salaries & Benefits	$3,530	$3,313	$3,274	$3,566	$3,703	$3,999	$4,319	$4,665	$5,038	$5,441	$5,876
Office Supplies & Postage	$63	$66	$69	$72	$75	$78	$81	$84	$88	$91	$95
Insurance - All	$420	$440	$460	$480	$500	$520	$541	$562	$585	$608	$633
Legal & Accounting	$420	$440	$460	$480	$500	$520	$541	$562	$585	$608	$633
Engineering & Professional	$840	$880	$920	$960	$1,000	$1,040	$1,082	$1,125	$1,170	$1,217	$1,265
Misc Expenses	$21	$22	$23	$24	$25	$26	$27	$28	$29	$30	$32
Total Expenses	**$18,748**	**$19,929**	**$21,191**	**$22,541**	**$23,985**	**$25,530**	**$27,184**	**$28,955**	**$30,851**	**$32,882**	**$35,058**
Taxes and Interest	$1,701	$1,786	$1,893	$2,007	$2,127	$2,234	$2,345	$2,463	$2,586	$2,715	$2,851
Capital Improvement Program	$0	$10,000	$5,000	$0	$5,000	$0	$5,000	$0	$5,000	$0	$5,000
Loan and Bond Funds	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Net CIP	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Total Revenue Required	**$20,450**	**$31,715**	**$28,084**	**$24,548**	**$31,112**	**$27,764**	**$34,530**	**$31,417**	**$38,437**	**$35,597**	**$42,909**
Budget Surplus	**$13,377**	**$3,802**	**$9,564**	**$15,360**	**$11,190**	**$16,653**	**$12,108**	**$17,552**	**$12,982**	**$18,392**	**$13,780**

The District's water utility fund is projected to have adequate funding to meet all of its O&M, capital projects, and water use efficiency needs. The ending balance for each year is in surplus.

APPENDIX A

WATER FACILITIES INVENTORY

WATER FACILITIES INVENTORY (WFI) FORM

Washington State Department of Health
Division of Environmental Health
Office of Drinking Water

ONE FORM PER SYSTEM

Quarter: 1
Updated: 01/08/2025
Printed: 1/16/2025
WFI Printed For: On-Demand
Submission Reason: No Change

RETURN TO: Central Services - WFI, PO Box 47822, Olympia, WA, 98504-7822 or email wfi@doh.wa.gov

1. SYSTEM ID NO.	2. SYSTEM NAME	3. COUNTY	4. GROUP	5. TYPE
98128 K	WONDERLAND WATER COMPANY	MASON	A	Comm

6. PRIMARY CONTACT NAME & MAILING ADDRESS

BRANDY A. MILROY [WATER RESOURCE MANAG]
21971 N HWY 101
SHELTON, WA 98584

STREET ADDRESS IF DIFFERENT FROM ABOVE

ATTN
ADDRESS
CITY STATE ZIP

7. OWNER NAME & MAILING ADDRESS

MASON COUNTY PUD 1
BRANDY A. MILROY
21971 N HWY 101
SHELTON, WA 98584

WATER RESOURCE

STREET ADDRESS IF DIFFERENT FROM ABOVE

ATTN
ADDRESS
CITY STATE ZIP

9. 24 HOUR PRIMARY CONTACT INFORMATION		10. OWNER CONTACT INFORMATION	
Primary Contact Daytime Phone: (360) 877-5249		Owner Daytime Phone: (360) 877-5249 x268	
Primary Contact Mobile/Cell Phone: (360) 490-2459		Owner Mobile/Cell Phone: (360) 490-2459	
Primary Contact Evening Phone: (xxx)-xxx-xxxx		Owner Evening Phone: (xxx)-xxx-xxxx	
Fax:	E-mail: bxxxxxm@mason-pud1.org	Fax: (360) 877-5339	E-mail: bxxxxxm@mason-pud1.org

11. SATELLITE MANAGEMENT AGENCY - SMA (check only one)

- ☐ Not applicable (Skip to #12)
- ☒ Owned and Managed
- ☐ Managed Only
- ☐ Owned Only

SMA NAME: MASON COUNTY PUD 1 SMA Number: 111

12. WATER SYSTEM CHARACTERISTICS (mark all that apply)

- ☐ Agricultural
- ☐ Commercial / Business
- ☐ Day Care
- ☐ Food Service/Food Permit
- ☐ 1,000 or more person event for 2 or more days per year
- ☐ Hospital/Clinic
- ☐ Industrial
- ☐ Licensed Residential Facility
- ☐ Lodging
- ☐ Recreational / RV Park
- ☒ Residential
- ☐ School
- ☐ Temporary Farm Worker
- ☐ Other (church, fire station, etc.):

13. WATER SYSTEM OWNERSHIP (mark only one)

- ☐ Association
- ☐ City / Town
- ☐ County
- ☐ Federal
- ☐ Investor
- ☐ Private
- ☒ Special District
- ☐ State

14. STORAGE CAPACITY (gallons)

600

15	16	17	18									19			20	21						22	23	24			
	SOURCE NAME	INTERTIE	SOURCE CATEGORY									USE				TREATMENT						DEPTH		SOURCE LOCATION			
Source Number	LIST UTILITY'S NAME FOR SOURCE AND WELL TAG ID NUMBER. Example: WELL #1 XYZ456 IF SOURCE IS PURCHASED OR INTERTIED, LIST SELLER'S NAME Example: SEATTLE	INTERTIE SYSTEM ID NUMBER	WELL	WELL FIELD	WELL IN A WELL FIELD	SPRING	SPRING FIELD	SPRING IN SPRINGFIELD	SEA WATER	SURFACE WATER	RANNEY / INF. GALLERY	OTHER	PERMANENT	SEASONAL	EMERGENCY	SOURCE METERED	NONE	CHLORINATION	FILTRATION	FLUORIDATION	IRRADIATION (UV)	OTHER	DEPTH TO FIRST OPEN TERVAL IN FEET	CAPACITY (GALLONS PER MINUTE)	1/4, 1/4 SECTION	SECTION NUMBER	TOWNSHIP	RANGE
S01	Well #1 AHB625		X									X			Y	X						230	100	NE SW	29	21N	02W

WATER FACILITIES INVENTORY (WFI) FORM - Continued

1. SYSTEM ID NO.	2. SYSTEM NAME	3. COUNTY	4. GROUP	5. TYPE
98128 K	WONDERLAND WATER COMPANY	MASON	A	Comm

	ACTIVE SERVICE CONNECTIONS	DOH USE ONLY! CALCULATED ACTIVE CONNECTIONS	DOH USE ONLY! APPROVED CONNECTIONS
25. SINGLE FAMILY RESIDENCES (How many of the following do you have?)		34	42
A. Full Time Single Family Residences (Occupied 180 days or more per year)	34		
B. Part Time Single Family Residences (Occupied less than 180 days per year)	0		
26. MULTI-FAMILY RESIDENTIAL BUILDINGS (How many of the following do you have?)			
A. Apartment Buildings, condos, duplexes, barracks, dorms	0		
B. Full Time Residential Units in the Apartments, Condos, Duplexes, Dorms that are occupied more than 180 days/year	0		
C. Part Time Residential Units in the Apartments, Condos, Duplexes, Dorms that are occupied less than 180 days/year	0		
27. NON-RESIDENTIAL CONNECTIONS (How many of the following do you have?)			
A. Recreational Services and/or Transient Accommodations (Campsites, RV sites, hotel/motel/overnight units)	0	0	0
B. Institutional, Commercial/Business, School, Day Care, Industrial Services, etc.	0	0	0
28. TOTAL SERVICE CONNECTIONS		34	42

29. FULL-TIME RESIDENTIAL POPULATION

A. How many residents are served by this system 180 or more days per year? 82

30. PART-TIME RESIDENTIAL POPULATION	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
A. How many part-time residents are present each month?												
B. How many days per month are they present?												

31. TEMPORARY & TRANSIENT USERS	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
A. How many total visitors, attendees, travelers, campers, patients or customers have access to the water system each month?												
B. How many days per month is water accessible to the public?												

32. REGULAR NON-RESIDENTIAL USERS	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
A. If you have schools, daycares, or businesses connected to your water system, how many students, daycare children and/or employees are present each month that are NOT already included in the residential population?												
B. How many days per month are they present?												

33. ROUTINE COLIFORM SCHEDULE	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
	1	1	1	1	1	1	1	1	1	1	1	1

34. NITRATE SCHEDULE	QUARTERLY	ANNUALLY	ONCE EVERY 3 YEARS
(One Sample per source by time period)			

35. Reason for Submitting WFI:

☐ Update - Change ☐ Update - No Change ☐ Inactivate ☐ Re-Activate ☐ Name Change ☐ New System ☐ Other _____

36. I certify that the information stated on this WFI form is correct to the best of my knowledge.

SIGNATURE: _____ **DATE:** _____

PRINT NAME: _____ **TITLE:** _____

WS ID	WS Name
98128	WONDERLAND WATER COMPANY

Total WFI Printed: 1

Washington State Department of Health
Division of Environmental Health
Office of Drinking Water

Water Facilities Inventory (WFI)

Report Create Date:	1/16/2025		
Water System Id(s):	98128K		
Print Data on Distribution Page:	ALL		
Print Copies For:	DOH Copy		
Water System Name:	ALL		
County:	-- Any --		
Region:	ALL		
Group:	ALL		
Type:	ALL		
Permit Renewal Quarter:	ALL		
Water System Is New:	ALL		
Water System Status:	ALL		
Water Status Date From:	ALL	**To**	ALL
Water System Update Date	ALL	**To**	ALL
Owner Number:	ALL		
SMA Number:	ALL		
SMA Name:	ALL		
Active Connection Count From:	ALL	**To:**	ALL
Approved Connection Count	ALL	**To:**	ALL
Full-Time Population From:	ALL	**To:**	ALL
Water System Expanding	ALL		
Source Type:	ALL		
Source Use:	ALL		
WFI Printed For:	On-Demand		

WATER FACILITIES INVENTORY (WFI) FORM

Washington State Department of Health
Division of Environmental Health
Office of Drinking Water

ONE FORM PER SYSTEM

Quarter: 1
Updated: 01/08/2025
Printed: 8/6/2025
WFI Printed For: On-Demand
Submission Reason: No Change

RETURN TO: Central Services - WFI, PO Box 47822, Olympia, WA, 98504-7822 or email wfi@doh.wa.gov

1. SYSTEM ID NO.	2. SYSTEM NAME	3. COUNTY	4. GROUP	5. TYPE
98128 K	WONDERLAND WATER COMPANY	MASON	A	Comm

6. PRIMARY CONTACT NAME & MAILING ADDRESS

BRANDY A. MILROY [WATER RESOURCE MANAG]
21971 N HWY 101
SHELTON, WA 98584

STREET ADDRESS IF DIFFERENT FROM ABOVE

ATTN
ADDRESS
CITY STATE ZIP

7. OWNER NAME & MAILING ADDRESS

MASON COUNTY PUD 1
BRANDY A. MILROY
21971 N HWY 101
SHELTON, WA 98584

WATER RESOURCE

STREET ADDRESS IF DIFFERENT FROM ABOVE

ATTN
ADDRESS
CITY STATE ZIP

9. 24 HOUR PRIMARY CONTACT INFORMATION		10. OWNER CONTACT INFORMATION	
Primary Contact Daytime Phone: (360) 877-5249		Owner Daytime Phone: (360) 877-5249 x268	
Primary Contact Mobile/Cell Phone: (360) 490-2459		Owner Mobile/Cell Phone: (360) 490-2459	
Primary Contact Evening Phone: (xxx)-xxx-xxxx		Owner Evening Phone: (xxx)-xxx-xxxx	
Fax:	E-mail: bxxxxxm@mason-pud1.org	Fax: (360) 877-5339	E-mail: bxxxxxm@mason-pud1.org

11. SATELLITE MANAGEMENT AGENCY - SMA (check only one)

- ☐ Not applicable (Skip to #12)
- ☒ Owned and Managed
- ☐ Managed Only
- ☐ Owned Only

SMA NAME: MASON COUNTY PUD 1 SMA Number: 111

12. WATER SYSTEM CHARACTERISTICS (mark all that apply)

- ☐ Agricultural
- ☐ Commercial / Business
- ☐ Day Care
- ☐ Food Service/Food Permit
- ☐ 1,000 or more person event for 2 or more days per year
- ☐ Hospital/Clinic
- ☐ Industrial
- ☐ Licensed Residential Facility
- ☐ Lodging
- ☐ Recreational / RV Park
- ☒ Residential
- ☐ School
- ☐ Temporary Farm Worker
- ☐ Other (church, fire station, etc.): _____

13. WATER SYSTEM OWNERSHIP (mark only one)

- ☐ Association
- ☐ City / Town
- ☐ County
- ☐ Federal
- ☐ Investor
- ☐ Private
- ☒ Special District
- ☐ State

14. STORAGE CAPACITY (gallons)

600

15	16	17	18									19			20	21						22	23	24			
	SOURCE NAME	INTERTIE	SOURCE CATEGORY									USE				TREATMENT						DEPTH		SOURCE LOCATION			
Source Number	LIST UTILITY'S NAME FOR SOURCE AND WELL TAG ID NUMBER. Example: WELL #1 XYZ456 IF SOURCE IS PURCHASED OR INTERTIED, LIST SELLER'S NAME Example: SEATTLE	INTERTIE SYSTEM ID NUMBER	WELL	WELL FIELD	WELL IN A WELL FIELD	SPRING	SPRING FIELD	SPRING IN SPRINGFIELD	SEA WATER	SURFACE WATER	RANNEY / INF. GALLERY	OTHER	PERMANENT	SEASONAL	EMERGENCY	SOURCE METERED	NONE	CHLORINATION	FILTRATION	FLUORIDATION	IRRADIATION (UV)	OTHER	DEPTH TO FIRST OPEN TERVAL IN FEET	CAPACITY (GALLONS PER MINUTE)	1/4, 1/4 SECTION	SECTION NUMBER	TOWNSHIP	RANGE
S01	Well #1 AHB625		X									X			Y	X						230	100	NE SW	29	21N	02W

WATER FACILITIES INVENTORY (WFI) FORM - Continued

1. SYSTEM ID NO.	2. SYSTEM NAME	3. COUNTY	4. GROUP	5. TYPE
98128 K	WONDERLAND WATER COMPANY	MASON	A	Comm

	ACTIVE SERVICE CONNECTIONS	DOH USE ONLY! CALCULATED ACTIVE CONNECTIONS	DOH USE ONLY! APPROVED CONNECTIONS
25. SINGLE FAMILY RESIDENCES (How many of the following do you have?)		34	42
A. Full Time Single Family Residences (Occupied 180 days or more per year)	34		
B. Part Time Single Family Residences (Occupied less than 180 days per year)	0		
26. MULTI-FAMILY RESIDENTIAL BUILDINGS (How many of the following do you have?)			
A. Apartment Buildings, condos, duplexes, barracks, dorms	0		
B. Full Time Residential Units in the Apartments, Condos, Duplexes, Dorms that are occupied more than 180 days/year	0		
C. Part Time Residential Units in the Apartments, Condos, Duplexes, Dorms that are occupied less than 180 days/year	0		
27. NON-RESIDENTIAL CONNECTIONS (How many of the following do you have?)			
A. Recreational Services and/or Transient Accommodations (Campsites, RV sites, hotel/motel/overnight units)	0	0	0
B. Institutional, Commercial/Business, School, Day Care, Industrial Services, etc.	0	0	0
28. TOTAL SERVICE CONNECTIONS		34	42

29. FULL-TIME RESIDENTIAL POPULATION

A. How many residents are served by this system 180 or more days per year? 82

30. PART-TIME RESIDENTIAL POPULATION	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
A. How many part-time residents are present each month?												
B. How many days per month are they present?												

31. TEMPORARY & TRANSIENT USERS	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
A. How many total visitors, attendees, travelers, campers, patients or customers have access to the water system each month?												
B. How many days per month is water accessible to the public?												

32. REGULAR NON-RESIDENTIAL USERS	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
A. If you have schools, daycares, or businesses connected to your water system, how many students, daycare children and/or employees are present each month that are NOT already included in the residential population?												
B. How many days per month are they present?												

33. ROUTINE COLIFORM SCHEDULE	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
	1	1	1	1	1	1	1	1	1	1	1	1

34. NITRATE SCHEDULE	QUARTERLY	ANNUALLY	ONCE EVERY 3 YEARS
(One Sample per source by time period)			

35. Reason for Submitting WFI:

☐ Update - Change ☐ Update - No Change ☐ Inactivate ☐ Re-Activate ☐ Name Change ☐ New System ☐ Other _____

36. I certify that the information stated on this WFI form is correct to the best of my knowledge.

SIGNATURE: _____ **DATE:** _____

PRINT NAME: _____ **TITLE:** _____

WS ID	WS Name
98128	WONDERLAND WATER COMPANY

Total WFI Printed: 1

Washington State Department of Health
Division of Environmental Health
Office of Drinking Water

Water Facilities Inventory (WFI)

Report Create Date:	8/6/2025		
Water System Id(s):	98128K		
Print Data on Distribution Page:	ALL		
Print Copies For:	DOH Copy		
Water System Name:	ALL		
County:	-- Any --		
Region:	ALL		
Group:	ALL		
Type:	ALL		
Permit Renewal Quarter:	ALL		
Water System Is New:	ALL		
Water System Status:	ALL		
Water Status Date From:	ALL	**To**	ALL
Water System Update Date	ALL	**To**	ALL
Owner Number:	ALL		
SMA Number:	ALL		
SMA Name:	ALL		
Active Connection Count From:	ALL	**To:**	ALL
Approved Connection Count	ALL	**To:**	ALL
Full-Time Population From:	ALL	**To:**	ALL
Water System Expanding	ALL		
Source Type:	ALL		
Source Use:	ALL		
WFI Printed For:	On-Demand		

APPENDIX B

WELL LOGS

File Original and First Copy with Department of Ecology
Second Copy — Owner's Copy
Third Copy — Driller's Copy

WATER WELL REPORT
STATE OF WASHINGTON

Application No. 62-20740
Permit No 62-20740 P

(1) OWNER: Name Wonderland - John Budd Address Route 4 Box 298, Shelton, Wn.

(2) LOCATION OF WELL: County Mason NW¼ NE¼ SW¼ Sec. 29 T. 21 N., R. 2W W.M.

Bearing and distance from section or subdivision corner WONDERLAND SUBDIVISION WELL LOT #22

(3) PROPOSED USE: Domestic [X] Industrial [ ] Municipal [ ] Irrigation [ ] Test Well [ ] Other [ ]

(4) TYPE OF WORK: Owner's number of well (if more than one) ....
New well [X] Method: Dug [ ] Bored [ ]
Deepened [ ] Cable [X] Driven [ ]
Reconditioned [ ] Rotary [ ] Jetted [ ]

(5) DIMENSIONS: Diameter of well 8 inches.
Drilled 217 ft. Depth of completed well 217 ft.

(6) CONSTRUCTION DETAILS:

Casing installed: 8 " Diam. from 0 ft. to 217 ft.
Threaded [ ] " Diam. from ft. to ft.
Welded [X] " Diam. from ft. to ft.

Perforations: Yes [ ] No [X]
Type of perforator used
SIZE of perforations in. by in.
perforations from ft. to ft.
perforations from ft. to ft.
perforations from ft. to ft.

Screens: Yes [X] No [ ]
Manufacturer's Name Johnson
Type SSteel Model No.
Diam. 8" Slot size 80 from 212 ft. to 217 ft.
Diam. Slot size from ft. to ft.

Gravel packed: Yes [ ] No [X] Size of gravel:
Gravel placed from ft. to ft.

Surface seal: Yes [X] No [ ] To what depth? 22 ft.
Material used in seal Cement
Did any strata contain unusable water? Yes [ ] No [X]
Type of water? Depth of strata
Method of sealing strata off

(7) PUMP: Manufacturer's Name S Sta Rite
Type: Submersible H.P. 10

(8) WATER LEVELS: Land-surface elevation above mean sea level.... ft.
Static level 109 ft. below top of well Date 3/7/73
Artesian pressure lbs. per square inch Date
Artesian water is controlled by (Cap, valve, etc.)

(9) WELL TESTS: Drawdown is amount water level is lowered below static level
Was a pump test made? Yes [X] No [ ] If yes, by whom Bedell Drill Co.
Yield: 100 gal./min. with 70 ft. drawdown after 6 hrs.
" " " "
" " " "

Recovery data (time taken as zero when pump turned off) (water level measured from well top to water level)

Time	Water Level	Time	Water Level	Time	Water Level
4:15	179	4:23	109		

Date of test
Bailer test gal./min. with ft. drawdown after hrs.
Artesian flow g.p.m. Date
Temperature of water Was a chemical analysis made? Yes [X] No [ ]

(10) WELL LOG: 1270' S & 74°23½' W from Center of Sec. 29

Formation: *Describe by color, character, size of material and structure, and show thickness of aquifers and the kind and nature of the material in each stratum penetrated, with at least one entry for each change of formation.*

MATERIAL	FROM	TO
Shot Clay	0	22
Sand, Gravel & Clay	22	33
Gravel & Clay	33	106
Sand, Clay & Water	106	204
Sand, Gravel & Water	204	217

RECEIVED
OCT 18 1973
DEPARTMENT OF ECOLOGY
SOUTHWEST REGIONAL OFFICE

Work started 2/13, 19 73. Completed 3/7, 19 73

WELL DRILLER'S STATEMENT:

This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.

NAME Bedell Drilling Co.
(Person, firm, or corporation) (Type or print)

Address 1583 E. Dickinson, Shelton, Wash.

[Signed] Lawrence Bedell
(Well Driller)

License No 223-02-4876 Date 10/2, 19 73

OK/cwhm 10-24-73

(USE ADDITIONAL SHEETS IF NECESSARY)

S. F. No. 7356—OS—(Rev. 4-71).

3

The Department of Ecology does NOT Warranty the Data and/or the Information on this Well Report.

File Original and First Copy with Department of Ecology
Second Copy — Owner's Copy
Third Copy — Driller's Copy

WATER WELL REPORT
STATE OF WASHINGTON

Application No. .....
Permit No. .....

(1) **OWNER:** Name Barb's Country Kitchen Address E2810 Spencerlake Rd

(2) **LOCATION OF WELL:** County Mason — NE ¼ SW ¼ Sec 29 T 21 N., R 2 W W.M.

Bearing and distance from section or subdivision corner

(3) **PROPOSED USE:** Domestic [X] Industrial [ ] Municipal [ ]
Irrigation [ ] [redacted] Other [ ]

(4) **TYPE OF WORK:** Owner's number of well (if more than one) ....
New well [X] Method: Dug [ ] Bored [ ]
Deepened [ ] Cable [ ] Driven [ ]
Reconditioned [ ] Rotary [X] Jetted [ ]

(5) **DIMENSIONS:** Diameter of well 6 inches.
Drilled 195 ft. Depth of completed well 195 ft.

(6) **CONSTRUCTION DETAILS:**

Casing installed: ..." Diam. from ... ft. to ... ft.
Threaded [ ] ..." Diam. from ... ft. to ... ft.
Welded [X] 6 " Diam. from 0 ft. to 195 ft.

Perforations: Yes [ ] No [X]
Type of perforator used ...
SIZE of perforations ... in. by ... in.
... perforations from ... ft. to ... ft.
... perforations from ... ft. to ... ft.
... perforations from ... ft. to ... ft.

Screens: Yes [ ] No [X]
Manufacturer's Name ...
Type ... Model No. ...
Diam. ... Slot size ... from ... ft. to ... ft.
Diam. ... Slot size ... from ... ft. to ... ft.

Gravel packed: Yes [ ] No [X] Size of gravel: ...
Gravel placed from ... ft. to ... ft.

Surface seal: Yes [X] No [ ] To what depth? 18 ft.
Material used in seal Bentonite
Did any strata contain unusable water? Yes [ ] No [ ]
Type of water? ... Depth of strata ...
Method of sealing strata off ...

(7) **PUMP:** Manufacturer's Name RJacket
Type: 546 H.P. 3

(8) **WATER LEVELS:** Land-surface elevation above mean sea level .... ft.
Static level 81 ft. below top of well Date 6-26-87
Artesian pressure ... lbs. per square inch Date ...
Artesian water is controlled by ... (Cap, valve, etc.)

(9) **WELL TESTS:** Drawdown is amount water level is lowered below static level
Was a pump test made? Yes [X] No [ ] If yes, by whom? Driller
Yield: 37.5 gal./min. with 11 ft. drawdown after 3 hrs.
" " " "
" " " "

Recovery data (time taken as zero when pump turned off) (water level measured from well top to water level)

Time	Water Level	Time	Water Level	Time	Water Level

Date of test ...
Bailer test ... gal./min. with ... ft. drawdown after ... hrs.
Artesian flow ... g.p.m. Date ...
Temperature of water ... Was a chemical analysis made? Yes [ ] No [ ]

(10) **WELL LOG:**

Formation: Describe by color, character, size of material and structure, and show thickness of aquifers and the kind and nature of the material in each stratum penetrated, with at least one entry for each change of formation.

MATERIAL	FROM	TO
Top Soil	0	2
Cem Gr	2	5
Gr Sand	5	20
Cem Gr	20	40
" "	40	60
blue Clay Gr	60	80
Sand Gr	80	100
" "	100	120
Cem Gr blue	120	140
blue Clay Sand	140	160
" " "	160	180
Gr Sand (Water)	180	195

RECEIVED
JUL 22 1987
STATE OF WASHINGTON
DEPT. OF ECOLOGY

Work started 6-26 , 19 87 Completed 6-28- , 19 87

WELL DRILLER'S STATEMENT:

This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.

Patterson Russell Drilling

NAME ... (Person, firm, or corporation) (Type or print)

Address PO Box 433 Shelton WA

[Signed] Bill Russell (Well Driller)

License No. 0444 Date 7-10-87, 19

(USE ADDITIONAL SHEETS IF NECESSARY)

ECY 050-1-20

The Department of Ecology does NOT Warranty the Data and/or the Information on this Well Report.

APPENDIX C

WATER RIGHTS

333311

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY

REEL 170 FR. 248

CERTIFICATE OF WATER RIGHT

☐ Surface Water (Issued in accordance with the provisions of Chapter 117, Laws of Washington for 1917, and amendments thereto, and the rules and regulations of the Department of Ecology.)

☒ Ground Water (Issued in accordance with the provisions of Chapter 263, Laws of Washington for 1945, and amendments thereto, and the rules and regulations of the Department of Ecology.)

PRIORITY DATE	APPLICATION NUMBER	PERMIT NUMBER	CERTIFICATE NUMBER
February 6, 1973	G 2-20740	G 2-20740 P	G 2-20740 C

NAME
JOHN R. BUDD ET AL

ADDRESS (STREET)	(CITY)	(STATE)	(ZIP CODE)
724 Railroad	Shelton	Washington	98584

This is to certify that the herein named applicant has made proof to the satisfaction of the Department of Ecology of a right to the use of the public waters of the State of Washington as herein defined, and under and specifically subject to the provisions contained in the Permit issued by the Department of Ecology, and that said right to the use of said waters has been perfected in accordance with the laws of the State of Washington, and is hereby confirmed by the Department of Ecology and entered of record as shown.

PUBLIC WATER TO BE APPROPRIATED

SOURCE
well

TRIBUTARY OF (IF SURFACE WATERS)

MAXIMUM CUBIC FEET PER SECOND	MAXIMUM GALLONS PER MINUTE	MAXIMUM ACRE-FEET PER YEAR
	100	120

QUANTITY, TYPE OF USE, PERIOD OF USE
120 acre-feet per year communtiy domestic supply continuously

LOCATION OF DIVERSION/WITHDRAWAL

APPROXIMATE LOCATION OF DIVERSION—WITHDRAWAL
1270 feet south 74°23½' west from center of Sec. 29.

LOCATED WITHIN (SMALLEST LEGAL SUBDIVISION)	SECTION	TOWNSHIP N.	RANGE, (E. OR W.) W.M.	W.R.I.A.	COUNTY
NW¼NE¼SW¼	29	21	2 W.	14	Mason

RECORDED PLATTED PROPERTY

LOT	BLOCK	OF (GIVE NAME OF PLAT OR ADDITION)

LEGAL DESCRIPTION OF PROPERTY ON WHICH WATER IS TO BE USED

Division One: The NW¼NE¼SW¼ and that part of the E½SW¼NE¼SW¼ north of county road in Sec. 29 T. 21 N., R. 2 W.W.M.

vision Two: The E½NE¼SW¼ of Sec. 29, T. 21 N., R. 2 W.W.M., EXCEPT the east 400 feet of the south 500 feet LESS county road.

300

FILED
REEL 170 FRAME 248-249
AUDITOR MASON COUNTY
RUTH E. BOYSEN

'77 AUG 31 AM 10:09

REQUEST OF
State of Washington
Dept Ecology

ECY 040-1-2 (Rev. 4-77)

(SEE REVERSE SIDE)

CERTIFICATE

PROVISIONS

REEL 170 FR. 249

The access port as required on your permit shall be maintained at all times.

The right to the use of the water aforesaid hereby confirmed is restricted to the lands or place of use herein described, except as provided in RCW 90.03.380, 90.03.390, and 90.44.020.

This certificate of water right is specifically subject to relinquishment for nonuse of water as provided in RCW 90.14.180.

Given under my hand and the seal of this office at Olympia *Washington, this* 26th *day of* August, *19* 77.

WILBUR G. HALLAUER, DIRECTOR
Department of Ecology

ENGINEERING DATA
OK JWM

by E.W. ASSELSTINE, Regional Manager

FOR COUNTY USE ONLY

Water Right Self-Assessment Form for Water System Plan

Mouse-over any link for more information. Click on any link for more detailed instructions.

Water Right Permit, Certificate, or Claim # *If water right is interruptible, identify limitation in yellow section below	WFI Source # If a source has multiple water rights, list each water right on separate line	Existing Water Rights Qi= Instantaneous Flow Rate Allowed (GPM or CFS) Qa= Annual Volume Allowed (Acre-Feet/Year) This includes wholesale water sold				Current Source Production – Most Recent Calendar Year Qi = Max Instantaneous Flow Rate Withdrawn (GPM or CFS) Qa = Annual Volume Withdrawn (Acre-Feet/Year) This includes wholesale water sold				10-Year Forecasted Source Production (determined from WSP) This includes wholesale water sold				20-Year Forecasted Source Production (determined from WSP) This includes wholesale water sold			
		Primary Qi Maximum Rate Allowed	Non-Additive Qi Maximum Rate Allowed	Primary Qa Maximum Volume Allowed	Non-Additive Qa Maximum Volume Allowed	Total Qi Maximum Instantaneous Flow Rate Withdrawn	Current Excess or (Deficiency) Qi	Total Qa Maximum Annual Volume Withdrawn	Current Excess or (Deficiency) Qa	Total Qi Maximum Instantaneous Flow Rate in 10 Years	10-Year Forecasted Excess or (Deficiency) Qi	Total Qa Maximum Annual Volume in 10 Years	10-Year Forecasted Excess or (Deficiency) Qa	Total Qi Maximum Instantaneous Flow Rate in 20 Years	20-Year Forecasted Excess or (Deficiency) Qi	Total Qa Maximum Annual Volume in 20 Years	20-Year Forecasted Excess or (Deficiency) Qa
1 G 2-20740 C	S01	100		120		62	48	12.5	107.5	78.3	21.7	11.9	108.1	84.4	15.6	12.8	107.2
2																	
3																	
4																	
5																	
6																	
	TOTALS =																
Column Identifiers for Calculations:		A		B		C	=A-C	D	=B-D	E	= A-E	F	=B-F	G	=A-G	H	=B-H

PENDING WATER RIGHT APPLICATIONS: Identify any water right applications that have been submitted to Ecology.

Application Number	New or Change Application?	Date Submitted	Quantities Requested			
			Primary Qi	Non-Additive Qi	Primary Qa	Non-Additive Qa

INTERTIES: Systems receiving wholesale water complete this section. Wholesaling systems must include water sold through intertie in the current and forecasted source production columns above.

Name of Wholesaling System Providing Water	Quantities Allowed In Contract		Expiration Date of Contract	Currently Purchased Current quantity purchased through intertie				10-Year Forecasted Purchase Forecasted quantity purchased through intertie				20-Year Forecasted Purchase Forecasted quantity purchased through intertie			
	Maximum Qi Instantaneous Flow Rate	Maximum Qa Annual Volume		Maximum Qi Instantaneous Flow Rate	Current Excess or (Deficiency) Qi	Maximum Qa Annual Volume	Current Excess or (Deficiency) Qa	Maximum Qi 10-Year Forecast	Future Excess or (Deficiency) Qi	Maximum Qa 10-Year Forecast	Future Excess or (Deficiency) Qa	Maximum Qi 20-Year Forecast	Future Excess or (Deficiency) Qi	Maximum Qa 20-Year Forecast	Future Excess or (Deficiency) Qa
1															
2															
3															
TOTALS =															
Column Identifiers for Calculations:	A	B		C	=A-C	D	=B-D	E	=A-E	F	=B-F	G	=A-G	H	=B-H

INTERRUPTIBLE WATER RIGHTS: Identify limitations on any water rights listed above that are interruptible.

Water Right #	Conditions of Interruption	Time Period of Interruption
1		
2		
3		

ADDITIONAL COMMENTS:

APPENDIX D

COLIFORM MONITORING PLAN – WONDERLAND

Coliform Monitoring Plan for: Mason County PUD No. 1

A. System Information

Plan Date: 08/03/2023

Water System Name Wonderland	**County** Mason	**System I.D. Number** 98128 K
Name of Plan Preparer Brandy Milroy	**Position** Water Resource Manger	**Daytime Phone** 360-877-5249
Sources: DOH Source Number, Source Name, Well Depth, Pumping Capacity	S01, Well #1 AHB625, 230, 100 GPM	
Storage: List and Describe	N/A	
Treatment: Source Number & Process	N/A	
Pressure Zones: Number and name	1	
Population by Pressure Zone	82	
Number of Routine Samples Required Monthly by Regulation:		1
Number of Sample Sites Needed to Represent the Distribution System:		3
***Request DOH Approval of Triggered Source Monitoring Plan?**		**Yes** ☐ **No** ☒

*If approval is requested a fee will be charged for the review.

B. Laboratory Information

Laboratory Name SPECTRA Laboratories Company	**Office Phone** 360-779-5141 **After Hours Phone** 360-633-6466
Address 26276 Twelve Trees Ln, #C, Poulsbo, WA 98370	**After Hours Phone** 360-633-6466 **Email** jasonp@spectra-lab.com
Hours of Operation 8 – 5 Monday - Friday	
Contact Name Jason Patrick	
Emergency Laboratory Name SPECTRA Laboratories Company	**Office Phone 360-779-5141** **After Hours Phone 360-633-6466**
Address 26276 Twelve Trees Ln, #C, Poulsbo, WA 98370	**After Hours Phone 360-633-6466** **Email** jasonp@spectra-lab.com
Hours of Operation 24/7	
Contact Name Jason Patrick	

C. Wholesaling of Groundwater

	Yes	No
We are a consecutive system and purchase groundwater from another water system.	☐	☒
If yes, Water System Name: Contact Name: Telephone Numbers Office - - After Hours - -		
We sell groundwater to other public water systems.	☐	☒
If yes, Water System Name: Contact Name: Telephone Numbers Office - - After Hours - -		

D. Routine, Repeat, and Triggered Source Sample Locations*

Location/Address for **Routine Sample Sites**	Location/Address for **Repeat Sample Sites**	Groundwater Sources for **Triggered Sample Sites****
X1.	1-1. 140 E Queens Way	**S01**
140 E Queens Way	1-2. 241 E Queens Way	
	1-3. 81 E Queens Way	
X2.	2-1. 81 E Queens Way	**S01**
81 E Queens Way	2-2. 61 E Queens Way	
	2-3. 140 E Queens Way	
X3.	3-1. 260 E Queens Way	**S01**
260 E Queens Way	3-2. 291 E Queens Way	
	3-3. 241 E Queens Way	

*NOTE: If you need more than three routine samples to cover the distribution system, attach additional sheets as needed.

**** When you collect the repeats, you must sample every groundwater source that was in use when the original routine sample was collected.**

Important Notes for Sample Collector: Do not take routine coliform samples from the well house or booster stations.

E. Reduced Triggered Source Monitoring Justification (add sheets as needed):

F. Routine Sample Rotation Schedule

Month	Routine Site(s)	Month	Routine Site(s)
January	X1	July	X1
February	X2	August	X2
March	X3	September	X3
April	X1	October	X1
May	X2	November	X2
June	X3	December	X3

G. Level 1 and Level 2 Assessment Contact Information

Name Tyrone Goos	**Office Phone** 360-877-5249 **After Hours Phone** 360-877-5249
Address 21971 N Us Hwy 101 Shelton, Wa. 98584	**Email** tgoos@mason-pud1.org
Name Garet Ogg	**Office Phone** 360-877-5249 **After Hours Phone** 360-877-5249
Address 21971 N Us Hwy 101 Shelton, Wa. 98584	**Email** brandym@mason-pud1.org

H. *E. coli*-Present Sample Response

Distribution System *E. coli* Response Checklist				
Background Information	**Yes**	**No**	**N/A**	**To Do List**
We inform staff members about activities within the distribution system that could affect water quality.	☒	☐	☐	☐
We document all water main breaks, construction & repair activities, and low pressure and outage incidents.	☒	☐	☐	☐
We can easily access and review documentation on water main breaks, construction & repair activities, and low pressure and outage incidents.	☒	☐	☐	☐
Our Cross-Connection Control Program is up-to-date.	☒	☐	☐	☐
We test all cross-connection control devices annually as required, with easy access to the proper documentation.	☒	☐	☐	☐
We routinely inspect all treatment facilities for proper operation.	☐	☐	☒	☐
We identified one or more qualified individuals who are able to conduct a Level 2 assessment of our water system.	☒	☐	☐	☐
We have procedures in place for disinfecting and flushing the water system if it becomes necessary.	☒	☐	☐	☐
We can activate an emergency intertie with an adjacent water system in an emergency.	☐	☒	☐	☐
We have a map of our service area boundaries.	☒	☐	☐	☐
We have consumers who may not have access to bottled or boiled water.	☐	☒	☐	☐
There is a sufficient supply of bottled water immediately available to our customers who are unable to boil their water.	☒	☐	☐	☐
We have identified the contact person at each day care, school, medical facility, food service, and other customers who may have difficulty responding to a Health Advisory.	☐	☒	☐	☐
We have messages prepared and translated into different languages to ensure our consumers will understand them.	☐	☒	☐	☐
We have the capacity to print and distribute the required number of notices in a short time period.	☒	☐	☐	☐
Policy Direction	**Yes**	**No**	**N/A**	**To Do List**
We have discussed the issue of *E. coli*-present sample results with our policy makers.	☒	☐	☐	☐
If we find *E. coli* in a routine distribution sample, the policy makers want to wait until repeat test results are available before issuing advice to water system customers.	☒	☐	☐	☐
(Cont.)				

Distribution System *E. coli* Response Checklist				
Potential Public Notice Delivery Methods	**Yes**	**No**	**N/A**	**To Do List**
It is feasible to deliver a notice going door-to-door.	☒	☐	☐	☐
We have a list of all of our customers' addresses.	☒	☐	☐	☐
We have a list of customer telephone numbers or access to a Reverse 9-1-1 system.	☒	☐	☐	☐
We have a list of customer email addresses.	☒	☐	☐	☐
We encourage our customers to remain in contact with us using social media.	☒	☐	☐	☐
We have an active website we can quickly update to include important messages.	☒	☐	☐	☐
Our customers drive by a single location where we could post an advisory and expect everyone to see it.	☐	☒	☐	☐
We need a news release to supplement our public notification process.	☐	☒	☐	☐

Distribution System *E. coli* Response Plan

If we have *E. coli* in our distribution system we will immediately:

1. Call DOH.
2. Collect repeat and triggered source samples per Part D. Collect additional investigative samples as necessary.
3. Chlorinate at reservoir.
4. Flush distribution system.
5. Investigate cause of contamination including interviewing staff about system activities since the previous month's samples were taken.
6. Review cross connections.
7. Discuss with DOH if health advisory should be issued. If so, issue boil water advisory – hand deliver to customers.
8. Post advisory in public locations and on social media.
9. Send advisory to news media.
10. Take investigative samples throughout distribution to verify distribution is clear of E. coli.
11. If distribution system is clear of E. coli, have DOH rescind boil water advisory. PUD hand deliver notices to customers.
12. Update social media and news media.
13. Investigate cause of source contamination.
14. Take repeat samples at source.
15. Take corrective action.
16. Install CT6 chlorination at S01, if needed.

E. coli-Present Triggered Source Sample Response Checklist – All Sources

Background Information	Yes	No	N/A	To Do List
We review our sanitary survey results and respond to any recommendations affecting the microbial quality of our water supply.	☒	☐	☐	☐
We address any significant deficiencies identified during a sanitary survey.	☒	☐	☐	☐
There are contaminant sources within our Wellhead Protection Area that could affect the microbial quality of our source water, and	☐	☒	☐	☐
If yes, we can eliminate them.	☐	☐	☒	☐
We routinely inspect our well site(s).	☒	☐	☐	☐
We have a good raw water sample tap installed at each source.	☒	☐	☐	☐
After we complete work on a source, we disinfect the source, flush, and collect an investigative sample.	☒	☐	☐	☐
Public Notice	**Yes**	**No**	**N/A**	**To Do List**
We discussed the requirement for immediate public notice of an *E. coli*-present source sample result with our water system's governing body (board of directors or commissioners) and received direction from them on our response plan.	☒	☐	☐	☐
We discussed the requirement for immediate public notice of an *E. coli*-present source sample result with our wholesale customers and encouraged them to develop a response plan.	☐	☒	☐	☐
We have prepared templates and a communications plan that will help us quickly distribute our messages.	☒	☐	☐	☐

E. coli-Present Triggered Source Sample Response Checklist – Source S01

Alternate Sources	Yes	No	N/A	To Do List
We can stop using this source and still provide reliable water service to our customers.	☐	☒	☐	☐
We have an emergency intertie with a neighboring water system that we can use until corrective action is complete (perhaps for several months).	☐	☒	☐	☐
We can provide bottled water to all or part of the distribution system for an indefinite period.	☐	☒	☐	☐
We can quickly replace our existing source of supply with a more protected new source.	☐	☒	☐	☐

Temporary Treatment	Yes	No	N/A	To Do List
This source is continuously chlorinated, and our existing facilities can provide 4-log virus treatment (CT = 6) before the first customer. If yes, at what concentration? _____ mg/L	☐	☒	☐	☐
We can quickly introduce chlorine into the water system and take advantage of the existing contact time to provide 4-log virus treatment to a large portion of the distribution system.	☒	☐	☐	☐
We can reduce the production capacity of our pumps or alter the configuration of our storage quantities (operational storage) to increase the amount of time the water stays in the system before the first customer to achieve CT = 6.	☒	☐	☐	☐
We can alter the demand for drinking water (maximum day or peak hour) through conservation messages to increase the time the water is in the system prior to the first customer in order to achieve 4-log virus treatment with chlorine.	☒	☐	☐	☐

*NOTE: If your system has multiple sources, you may want to complete a separate checklist for each source.

E. coli-Present Triggered Source Sample Response Plan – Source S01

If we have *E. coli* in Source Well 1 water we will immediately:

1. Call DOH.
2. Collect repeat and triggered source samples per Part D. Collect additional investigative samples as necessary.
3. Shut off contaminated source.
4. Flush distribution system.
5. Investigate cause of contamination including interviewing staff about system activities since the previous month's samples were taken.
6. Review cross connections at pump house.
7. Discuss with DOH if health advisory should be issued. If so, issue boil water advisory – hand deliver to customers.
8. Post advisory in public locations and on social media.
9. Send advisory to news media.
10. Take investigative samples throughout distribution to verify distribution is clear of E. coli.
11. If distribution system is clear of E. coli, have DOH rescind boil water advisory. PUD hand deliver notices to customers.
12. Update social media and news media.
13. Investigate cause of source contamination.
14. Take repeat samples at source.
15. Take corrective action.
16. Install CT6 chlorination at S01, if needed.


E WA 3
S01
WELL
4" PVC
E MAJESTY CT
4" PVC
4" PVC
#3
3-3
1-2
3-3
3-2
#1
1-1
2-3
#2
2-1
1-3
2-2
E KINGS WAY
4" PVC
AVA LOOP 3
4" PVC
E PICKERINGVIEW RD
- ROUTINE SAMPLE SITE
#-X - REPEAT SAMPLE SITE
N
SCALE Not to Scale
DATE MARCH 2019
APPROVED BY
WONDERLAND WATER SYSTEM
COLIFORM MONITORING PLAN
WATER OPERATIONS
PUBLIC UTILITY DISTRICT NO.1 OF MASON COUNTY
21971 N HWY 101 (Potlatch) SHELTON, WA. 98584
WO#
DR. BY MJB
CH. BY BAM
SHEET 1 OF 1
DRAWING NUMBER
REV NO
X:\New Water Maps\WONDERLAND\WONDERLAND WSP.dwg

APPENDIX E

CONSUMER CONFIDENCE REPORT – 2023 WONDERLAND

Importance of Fixing Leaks

Even small leaks add up to a lot of water over time. The chart at right shows how much water flows through a leak the size of the circle indicated. A pinprick sized hole means 3,600 gallons a month or 43,200 gallons a year. When this water flows through your meter, you are paying for water you are not using and the District is paying to pump this water - extra wear on the pumps and the cost of electricity to run the pump. Help preserve your water system and repair leaks on your service lines. We monitor the distribution system for leaks by visual inspection. Once the system is fully metered, we will be able to check the distribution system leakage on a monthly basis to determine if we have system leaks.

Water Loss in Gallons

Leak this Size	Loss Per Day	Loss Per Month	Leak the Size	Loss Per Day	Loss Per Month
.	120	3,600	●	6,640	199,520
•	300	10,800	●	6,964	209,520
•	693	20,790	●	8,424	252,720
•	1,200	36,000	●	9,585	296,640
•	1,920	57,600	●	11,324	339,720
•	3,095	92,880	●	12,750	361,600
•	4,295	128,880	●	14,952	448,560

How to Check Your Meter For Leaks

1. Locate your water meter. It is usually found in a small concrete or plastic box near the street.
2. If you need help locating your water meter, contact the P.U.D.
3. Turn off all water at the house and in the yard, including water-using appliances in the home.
4. Remember to shut off all indoor and outdoor faucets.
5. Check and record the current meter reading.
6. Wait at least 15 minutes before checking your meter again.
7. Remember, DO NOT use any water while you are waiting!
8. Read the water meter again. If the reading has changed, then you may have a leak that may require immediate attention.

Water Use Efficiency

Water use efficiency is a "proactive approach" to protect public health and water supplies. Droughts, climate change, growth demands and fewer granted water rights may lead to future long-term water disruptions due to declining water supplies. The District water use efficiency (WUE) program effectively plans and implements measures that can result in fewer water emergencies:

- Contributes to long-term water supply reliability and public health protection.
- Promotes good stewardship of the state's water resources.
- Ensures efficient operation and management of our water systems.

New WUE goals were approved in September 2018. To view all 6 Groups of WUE Goals please visit the districts website. https://mason-pud1.org/water-use-efficiency/ Under **Water Use Efficiency** click on Current Water Use Efficiency Goals.

The 2023 DSL for the Wonderland Water System is

Total Water Produced (TP) - 2,288,641 gallons
Authorized Consumption (AC) – 2,301,069 gallons
DSL Volume – -12,429
Note: Gallons for the entire system.
DSL Percentage – -0.5%
3-Year Rolling Average DSL – 1.1%

The approved 2018 goals for Group 1 10% or less DSL are

Production:

- Maintain DSL levels to 10% or less.

Consumption:

- Reduce summer peak daily demand by 1% per ERU in 6 years.
- Maintain ADD and summer peak daily demand.

Progress of Meeting Goals

Production:

- Does not apply to any of the 6 approved Groups. The current information is showing customers are using more than what is being produced. The water department is looking into what is cause this.

Consumption:

- Summer peak daily demand increased by 20% per ERU in the last 5 years.

Steps to Meet Goals

- Continue leak detection and repair.
- Continue to monitor DSL, well production, and consumption.
- Educate customers about impacts of peak demand on infrastructure.
- Consumption history shown on all water bills.
- Monitoring source meter and seeing why production is lower then consumption.

Employees getting ready for Customer Appreciation 2023

Water Use Efficiency Definitions

Authorized Consumption (AC): volume of water used by consumers as shown through meter readings, fire-fighting, system flushing, tank cleaning and street cleaning.

Average Daily Demand (ADD): average volume of water a typical single family home uses each day.

Distribution System Leakage (DSL): water lost from the system through leaking pipes, illegal water use, malfunctioning meters or meter reading errors. The volume difference of total water produced and authorized consumption (TP-AC).

Percent DSL=[(TP-AC)/TP]x100%

Total Water Produced (TP): volume of water pumped from a well, diverted from a surface water or purchased from another system.

Water Use Efficiency (WUE) Goal: a set target for water usage approved by the Board of Commissioners through the public process.

Water Use Efficiency Measure: actions set by the Board of Commissioners to reduce water loss and water demand approved through the public process.

Wonderland Water System

2023 Annual Water Quality & Water Use Efficiency Report

PWSID #98128K

System Summary

Welcome to the 2023 Water Quality and Use Efficiency Report. This report is designed to inform you about the water and services the district delivers to you every day. Our goal is to provide you with a safe and dependable supply of drinking water. To comply with State and Federal water quality laws, 12 water quality tests were performed for your system in 2023.

Our water source is the Wonderland Well which draws water from an aquifer 230' deep and is located at the end of E Majesty's Ct. The well and all services are metered. Mason County PUD No. 1 acquired the Wonderland water system in 2018. The system is approved for 42 connections, there are currently 34 connections on the water system.

A Water System Plan is available from our office that provides more information about the Wonderland Water System. Our well has been rated by the Washington State Department of Health as moderate risk for susceptibility for contamination. More information regarding this rating can be obtained by contacting PUD No. 1.

The State Dept. of Health has Source Water Assessment Program (SWAP)data available online at: https://fortress.wa.gov/doh/swap/ which lists potential contamination for each Group A water source in the state. This is an interactive map.

Well House

If you have any questions regarding this report, the water or PUD No. 1 please contact Brandy Milroy, Water Resource Manager at 360-877-5249 or brandym@mason-pud1.org. Also, don't forget PUD 1 board meetings are the 2nd and 4th Tuesdays of each month at our office in Potlatch (1 mile south of Hoodsport, WA) at 1 pm. The public is welcome to our meetings.

Health Effects of Contaminates

Nitrates: As a precaution we always notify physicians and health care providers in the area if there is ever a higher than normal level of nitrates in the water supply. Infants below the age of six months who drink water containing nitrate in excess of the MCL could become seriously ill and, if untreated, may die. Symptoms include shortness of breath and "blue baby" syndrome. Nitrate levels may rise quickly for short periods of time because of rain fall or agricultural activity. If you are caring for an infant, you should ask for advice from your health care provider.

Total Coliform: Coliforms are bacteria that are naturally present in the environment and are used as an indicator that other, potentially harmful, bacteria may be present.

Arsenic: YYour drinking water currently meets EPA's standard for arsenic. EPA continues to research the health effects of low levels of arsenic, which is a mineral known to cause cancer in humans at high concentrations and is linked to other health effects such as skin damage and circulatory problems.

Copper: Copper is an essential nutrient, but some people who drink water containing copper in excess of the action level over a relatively short amount of time could experience gastrointestinal distress. Some people who drink water containing copper in excess of the action level over many years could suffer liver or kidney damage. People with Wilson's Disease should consult their personal doctor.

Lead: Infants and children who drink water containing lead in excess of the action level could experience delays in their physical or mental development. Children could show slight deficits in attention span and learning abilities. Adults who drink water with excess lead over many years could develop kidney problems or high blood pressure.

Manganese: Manganese is known to occur naturally in well water due to the type of rock a well may be drilled into. Concentrations above the national guidelines may contribute to problems with taste, odor and color of the water coming out of your tap.

Chloride, Sodium and Salt Water Intrusion: Chloride and sodium levels rise when a well begins to pump from an aquifer mixing with sea water.

Turbidity: Turbidity has no health effects. However, turbidity can interfere with disinfection and provide a medium for microbial growth. Turbidity may indicate the presence of disease-causing organisms. These organisms include bacteria, viruses and parasites that can cause symptoms such as nausea, cramps, diarrhea and associated headaches.

Reason for Reporting Contaminants

The contaminant results table provided lists the drinking water contaminants we detected that are applicable for the calendar year of this report. The presence of contaminants in the water does not necessarily indicate that the water poses a health risk. Unless otherwise noted, the data presented in the table is from testing done in the calendar year of the report. The EPA or the state requires us to monitor for certain contaminants less than once per year because the concentrations of these contaminants do not change.

Water Quality Summary - Wonderland Water System PWSID #98128K

Contaminant	Violation Yes/No	Level Detected (range)	Unit Measurement	MCLG	MCL	Typical Source
Microbiological Contaminants						
Total Coliform Bacteria	NO	0	Present or Absent	0	One Positive monthly sample	Naturally present in the environment
Fecal Coliform and E.coli	NO	ND	Present or Absent	0	One Positive monthly sample	Human and animal fecal waste
Inorganic Contaminants						
Nitrate (as Nitrogen) (10/11/2023) Well #1	NO	ND	mg/L	10	10	Runoff from fertilizer use; leaching from septic tanks, erosion of natural deposits
Copper (07/28/2021) Distribution Samples (5)	NO	Max 0.392 (0.068-0.392) 90th %: <0.202	mg/L	1.3	AL=1.3	Corrosion of household plumbing systems; Erosion of natural deposits
Lead (07/28/2021) Distribution Samples (5)	NO	Max 0.0135 (<0.0015-0.0135) 90th %: <0.0135	mg/L	0	AL=0.015	Corrosion of household plumbing systems; Erosion of natural deposits
Arsenic (10/22/2015) Well #21	NO	<1	ppb	0	10	Erosion of natural deposits; runoff from orchards; runoff from glass & electronics production waste
Secondary Contaminants						
Manganese (10/26/2022) Well #1	YES	0.09	mg/L		0.05	Secondary contaminant that causes discoloration and bad taste; naturally present

What You Should Know About Water Quality

Drinking water, including bottled water, may reasonably be expected to contain at least small amounts of some contaminants. The presence of contaminants does not necessarily indicate that the water poses a health risk. More information about contaminants and potential health effects can be obtained by calling the EPA's Safe Drinking Water Hotline (1-800-426-4791).

Some people may be more vulnerable to contaminants in drinking water than the general population. Immuno-compromised persons such as persons with cancer undergoing chemotherapy, persons who have undergone organ transplants, people with HIV/AIDS or other immune system disorders, some elderly, and infants can be particularly at risk from infections. These people should seek advice about drinking water from their health care providers. EPA/CDC guidelines on appropriate means to lessen the risk of infection by Cryptosporidium and other microbial contaminants are available from the Safe Drinking Water Hotline (1-800-426-4791).

Maximum Contaminant Levels (MCLs) are set at very stringent levels. To understand the possible health effects described for many regulated contaminants, a person would have to drink 2 liters of water every day at the MCL for a lifetime to have a one-in-a-million chance of having the described health effect.

The sources of drinking water (both tap and bottled) include rivers, lakes, streams, ponds, reservoirs, springs and wells. As water travels over the surface of the land or through the ground, it dissolves naturally occurring minerals, in some cases, radioactive material, and can pick up substances resulting from the presence of animals or human activity.

Customer Appreciation 2023

TJ, Water Superintendent

Rooster, Water Foreman & Eric, Water Tech

In the water quality table you will find many terms and abbreviations you might not be familiar with. To help you better understand these terms, we have provided the following definitions:

Action Level (AL) - The concentration of a contaminant which, if exceeded, triggers treatment or other requirements which a water system must follow.

Lead and Copper 90th Percentile - out of every 10 homes sampled, 9 were at or below this level.

Maximum Contaminant Level (MCL) - the highest level of a contaminant that is allowed in drinking water. MCLs are set as close to the MCLGs as feasible using the best available treatment technology.

Maximum Contaminant Level Goal (MCLG) - the level of a contaminant in drinking water below which there is no known or expected risk to health. MCLGs allow for a margin of safety.

Maximum Residual Disinfectant Level (MRDL) - the highest level of a disinfectant allowed in drinking water. There is convincing evidence that addition of a disinfectant is necessary for control of microbial contaminants.

Maximum Residual Disinfectant Level Goal (MRDLG) - the level of a drinking water disinfectant below which there is no known or expected risk to health. MRDLGs do not reflect the benefits of the use of disinfectants to control microbial contaminants.

N/A - not applicable.

Nephelometric Turbidity Unit (NTU) - a measure of the clarity of water. Turbidity in excess of 5 NTU is just noticeable to the average person.

Non-Detects (ND) - Laboratory analysis indicates that the contaminant is not present or not detected.

Parts per Billion (ppb) or micrograms per Liter (µg/l) - one part per billion.

Parts per Million (ppm) or Milligrams per Liter (mg/l) - one part per million corresponds to one minute in two years or a single penny in $10,000.

Secondary Maximum Contaminant Level (SMCL) - these standards are developed to protect the aesthetic qualities of drinking water and are not health based.

State Reporting Level (SRL) - the level of contamination in which laboratory must report to the state.

Treatment Technique (TT) - a required process intended to reduce the level of a contaminant in drinking water.

< - Means 'less than.'

State Waivers

Waivers mean no testing or modified testing frequency for a specified contaminant is required for a set period of time. The Washington State Department of Health reduced the monitoring requirements for SOC (pesticides) and Soil Fumigants because the source is not at risk of contamination. The last sample collected for these contaminants was taken on 05/24/2004 and was found to meet all applicable standards.

Inorganic Contaminants: 1 sample every 9 years;

Synthetic Organic Contaminants (herbicides): 1 sample every 9 years;

Volatile Organic Contaminants: 1 sample every 6 years;

Dioxin, Diquat, Endothal, Glyphosphate, Insecticides: complete waivers;

Asbestos: waiver every 9 years.

Unregulated Contaminants Statement

Unregulated contaminants are those for which EPA has not established drinking water standards. The purpose of unregulated contaminant monitoring is to help EPA determine their occurrence in drinking water and potential need for future regulation.

Secondary Contaminants Statement

Secondary contaminant standards are developed to protect the aesthetic (taste, color and odor) qualities of drinking water and are not health based. Secondary contaminants include iron, manganese, silver, chloride, sulfate and zinc. Exceeding the MCL for any of these secondary contaminants does not mean the water system is in violation of the state or federal standard.

Washington State Office of Drinking Water Lead Statement

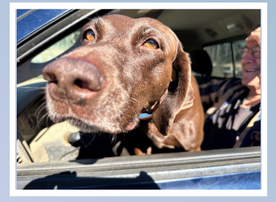
In Washington State, lead in drinking water comes primarily from materials and components used in household plumbing and service lines. Mason PUD No. 1 is responsible for providing high quality water, but cannot control the variety of materials used in plumbing components. Elevated levels of lead can cause serious health problems, especially in pregnant women and young children.

To help reduce potential exposure to lead: for any drinking water tap that has not been used for 6 hours or more, flush water for thirty (30) seconds to two (2) minutes through the tap until the water is noticeably colder before using for drinking or cooking. You can use the flushed water for watering plants, washing dishes or general cleaning. Only use water from the cold-water tap for drinking, cooking, and especially for making baby formula. Hot water is likely to contain higher levels of lead. If you are concerned about lead in your water, you may wish to have your water tested. Information on lead in drinking water is available from EPA's Safe Drinking Water Hotline at 1-800-426-4791 or online at http://www.epa.gov/safewater/lead.

Tap Water and Bottled Water Safety

To ensure that tap water is safe to drink, the Washington State Board of Health and/or EPA prescribe regulations that limit the amount of certain contaminants in water provided by public water systems. The Food and Drug Administration (FDA)

Customer Appreciation 2023



and the Washington Department of Agriculture regulations establish limits for contaminants in bottled water that must provide the same protection for public health.

How to Clear Chlorine from Tap Water

Occasionally we are required to chlorinate the distribution system. When that occurs and you prefer not to drink chlorinated water, fill a pitcher with tap water and leave it either on the counter or in the fridge over night. The chlorine will dissipate and you should not taste it in your drinking water from the pitcher. A filter on your faucet or in a pitcher may, also, be used to remove chlorine.

Contaminants That May Be Present In Source Water

- **Microbial contaminants,** such as viruses, parasites and bacteria, that may come from sewage treatment plants, septic systems, agricultural livestock operations and wildlife.
- **Inorganic contaminants,** such as salts and metals, which can be occur naturally or result from urban storm water runoff, industrial or domestic wastewater discharges, oil and gas production, mining or farming.
- **Pesticides and herbicides,** which may come from a variety · of sources, such as agriculture, urban storm water runoff and residential uses.
- **Radioactive contaminants** which can occur naturally or result from oil and gas production and mining activities.
- **Organic chemical contaminants**, including synthetic and volatile chemicals, which are by-products of industrial processes and petroleum production. They can also come from gas stations, urban storm water runoff and septic systems.

APPENDIX F

WATER QUALITY MONITORING SCHEDULE – WONDERLAND

Water Quality Monitoring Schedule

System: WONDERLAND WATER COMPANY
Contact: Brandy A Milroy
SMA ID: 111

PWS ID: 98128 K
Group: A - Comm
SMA Name: MASON COUNTY PUD 1

Region: SOUTHWEST
County: MASON

NOTE: To receive credit for compliance samples, you must fill out laboratory and sample paperwork completely, send your samples to a laboratory accredited by Washington State to conduct the analyses, AND ensure the results are submitted to DOH Office of Drinking Water. There is often a lag time between when you collect your sample, when we credit your system with meeting the monitoring requirement, and when we generate the new monitoring requirement.

Coliform Monitoring Requirements

	Dec 2024	Jan 2025	Feb 2025	Mar 2025	Apr 2025	May 2025	Jun 2025	Jul 2025	Aug 2025	Sep 2025	Oct 2025	Nov 2025
Coliform Monitoring Population	82	82	82	82	82	82	82	82	82	82	82	82
Number of Routine Samples Required	1	1	1	1	1	1	1	1	1	1	1	1

- Collect samples from representative points throughout the distribution system.
- Collect required repeat samples following an unsatisfactory sample. In addition, collect a sample from each operating groundwater source.
- For systems that chlorinate, record chlorine residual (measured when the coliform sample is collected) on the coliform lab slip.

Chemical Monitoring Requirements

Distribution Monitoring

Test Panel/Analyte	*# Samples Required*	*Compliance Period*	*Frequency*	*Last Sample Date*	*Next Sample Due*	
Lead and Copper	5	Jan 2022 - Dec 2024	standard - 3 year	07/18/2024		
Asbestos	0	Jan 2020 - Dec 2028	waiver - 9 year			

Notes on Distribution System Chemical Monitoring

For *Lead and Copper*:
- Collect samples from the COLD WATER side of a KITCHEN or BATHROOM faucet that is used daily.
- Before sampling, make sure the water has sat unused in the pipes for at least 6 hours, but we recommend no more than 12 hours (e.g. overnight).
- If your sampling frequency is annual or every 3 years, samples must be collected between June 1 and September 30. Samples collected outside this time frame for systems with an annual or triennial schedule are invalid and may lead to a monitoring violation.

For *Asbestos:* Collect the sample from one of your routine coliform sampling sites in an area of your distribution system that has asbestos concrete pipe.

Water Quality Monitoring Schedule

Source Monitoring

- Collect 'source' chemical monitoring samples from a tap after all treatment (if any), but before entering the distribution system.
- Washington State grants monitoring waivers for various test panels /analytes. Please note that we may require some monitoring as a condition of some waivers. We have granted complete waivers for dioxin, endothal, glyphosate, diquat, and insecticides.
- Nitrate, arsenic, iron, and other individual inorganics are included as part of a Complete Inorganic (IOC) analysis when it is collected.

Source S01 *Well #1 AHB625* *Well* *Use - Permanent* *Susceptibility - Moderate*

Test Panel/Analyte	*# Samples Required*	*Compliance Period*	*Frequency*	*Last Sample Date*	*Next Sample Due*
Nitrate	1	Jan 2024 - Dec 2024	standard - 1 year	10/11/2023	***Dec 2024***
Complete Inorganic (IOC)	1	Jan 2020 - Dec 2028	waiver - 9 year	10/22/2015	***Oct 2024***
Manganese	1	Jan 2023 - Dec 2025	standard - 3 year	10/26/2022	Sep 2025
Volatile Organics (VOC)	1	Jan 2020 - Dec 2025	waiver - 6 year	04/22/2022	
Herbicides	1	Jan 2023 - Dec 2031	waiver - 9 year	05/18/2022	May 2031
Pesticides	0	Jan 2023 - Dec 2025	waiver - 3 year	05/24/2004	
PFAS	0	Jan 2023 - Dec 2025	standard - 3 year	03/09/2022	
Soil Fumigants	0	Jan 2023 - Dec 2025	waiver - 3 year		
Gross Alpha	1	Jan 2020 - Dec 2025	standard - 6 year	10/21/2021	
Radium 228	1	Jan 2020 - Dec 2025	standard - 6 year	10/21/2021	

Water Quality Monitoring Schedule

Other Information

Other Reporting Schedules	*Due Date*
Submit Consumer Confidence Report (CCR) to customers and ODW (Community systems only):	07/01/2024
Submit CCR certification form to ODW (Community systems only):	10/01/2024
Submit Water Use Efficiency report online to ODW and to customers (Community and other municipal water systems only):	07/01/2024
Send notices of lead and copper sample results to the customers sampled:	30 days after you receive the laboratory results
Submit Certification of customer notification of lead and copper results to ODW:	90 days after you notify customers
Submit Lead Service Line Inventory	10/16/2024
Homeowner notification of LSLI status for those with LSL, GRR or unknown	11/15/2024 or 30 days after completion

Special Notes

None

Southwest Regional Water Quality Monitoring Contacts

For questions regarding chemical monitoring:	Sophia Petro: (564) 669-0856 or sophia.petro@doh.wa.gov
For questions regarding DBPs:	Regina Grimm, p.e.: (564) 669-0857 or regina.grimm@doh.wa.gov
For questions regarding coliform bacteria and microbial issues:	Southwest Office: (360) 236-3030 or SWRO.Coli@doh.wa.gov

Additional Notes

The information on this monitoring schedule is valid as of the date in the upper left corner on the first page. However, the information may change with subsequent updates in our water quality monitoring database as we receive new data or revise monitoring schedules. There is often a lag time between when you collect your sample and when we credit your system with meeting the monitoring requirement.

We have not designed this monitoring schedule to display all compliance requirements. The purpose of this schedule is to assist water systems with planning for most water quality monitoring, and to allow systems to compare their records with DOH ODW records. Please be aware that this monitoring schedule does not include constituents that require a special monitoring frequency, such as monitoring affiliated with treatment.

Any inaccuracies on this schedule will not relieve the water system owner and operator of the requirement to comply with applicable regulations.

If you have any questions about your monitoring requirements, please contact the regional office staff listed above.

APPENDIX G

HYDRAULIC ANALYSIS

2025 Peak Hour Demand Results

ID	Demand (gpm)	Elevation (ft)	Head (ft)	Pressure (psi)
J10	5.96	245.3	328.71	36.14
J12	5.96	223.4	328.05	45.34
J14	5.96	226.17	328.01	44.13
J16	5.96	218.63	327.96	47.37
J18	5.96	224.24	327.95	44.94
J20	5.96	209.52	327.88	51.29
J22	5.96	206.6	327.79	52.51
J24	5.96	204.09	327.78	53.59
J26	5.96	212.84	327.77	49.8

2035 Peak Hour Demand Results

ID	Demand (gpm)	Elevation (ft)	Head (ft)	Pressure (psi)
J10	6.71	245.3	328.67	36.12
J12	6.71	223.4	327.85	45.26
J14	6.71	226.17	327.8	44.03
J16	6.71	218.63	327.74	47.28
J18	6.71	224.24	327.72	44.84
J20	6.71	209.52	327.64	51.18
J22	6.71	206.6	327.52	52.4
J24	6.71	204.09	327.51	53.48
J26	6.71	212.84	327.5	49.68

2045 Peak Hour Demand Results

ID	Demand (gpm)	Elevation (ft)	Head (ft)	Pressure (psi)
J10	7.12	245.3	328.64	36.11
J12	7.12	223.4	327.73	45.2
J14	7.12	226.17	327.67	43.98
J16	7.12	218.63	327.6	47.22
J18	7.12	224.24	327.59	44.78
J20	7.12	209.52	327.49	51.12
J22	7.12	206.6	327.36	52.33
J24	7.12	204.09	327.36	53.41
J26	7.12	212.84	327.34	49.61

APPENDIX H

WUE

Mason County Public Utility District No. 1
Board of Commissioners Board Workshop
Public Hearing and Regular Board Meeting
September 10, 2024, Potlatch, Washington

10:00 a.m.- Board Strategic Planning Workshop

Present: Jack Janda, Ron Gold, Mike Sheetz, Kristin Masteller Visitors: None

Jack called the workshop to order at 10:00 a.m. Kristin reviewed the proposed 2025 Strategic Plan action items for the work plan with commissioners. Conversation on the work plan ensued.

At 11:40 a.m. Jack adjourned the workshop.

1:00 p.m.- Public Hearing- Water Use Efficiency Goals

Present:
Jack Janda, President
Ron Gold, Vice President
Mike Sheetz, Board Secretary
Kristin Masteller, General Manager
Katie Arnold, District Treasurer
Brandy Milroy, Water Resource Manager
Rob Johnson, Legal Counsel

Visitors: Liz Anderson, Nicolas Garcia, Stefany Zelepuza, Travis Nelson, WPUDA Staff; Debra Lester, Kitsap PUD, Jane Van Dyke, Clark PUD

CALL TO ORDER: Jack called the public hearing for Water Use Efficiency Goals to order at 1:00 p.m. WPUDA staff and board officers were present. No members of the public were present.

Brandy gave a review of the next six-year metrics for the Water Use Efficiency program. She also highlighted several systems that have benefitted from improvements to achieve substantial leak reduction since the last approval cycle. Agate Beach and Hood Canal systems were at Tier 5 with 40-50% water loss and now they both are at <10% and <20% respectively, thanks to leak repairs and mainline replacement. Arcadia Estates and Canal Beach Tracts are now less than 10%. Union is at 4%. The PUD continues to prioritize mainline replacement and is doing leak repairs year-round to help reduce distribution system leakage.

At 1:04, Jack closed the public hearing and called the regular business meeting to order.

Mason County Public Utility District No. 1
Board of Commissioners Board Workshop
Public Hearing and Regular Board Meeting
September 10, 2024, Potlatch, Washington

1:04 p.m.- Regular Business Meeting

PUBLIC COMMENT: None.

APPROVAL OF CONSENT AGENDA

Minutes:	Regular Board Meeting September 10, 2024	
Disbursements:	Accounts Payable Wire	$ 58,909.18
	Check Nos. 125482-125527	$ 619,196.51
	Payroll Wire	$ 74,397.84
	Grand Total	**$ 752,503.53**

Ron made a motion to approve the consent agenda as presented; Mike seconded the motion. It passed unanimously.

Business Agenda:

Approve the 2024 Water Use Efficiency Goals– Ron made a motion to adopt the 2024 Water Use Efficiency Goals as presented; Mike seconded the motion. It passed unanimously.

Visit from the Washington PUD Association– Debra Lester and Jane Van Dyke are officers of the board of directors for WPUDA and they did an introduction regarding the member services WPUDA provides and requested feedback on the way that the Association can better serve Mason PUD 1 and other members. Liz Anderson, WPUDA Executive Director then spoke about Association priorities and staffing and how that ties into the things that are impacting Mason PUD1. Stefany Zelepuza, Travis Nelson and Nicolas Garcia each gave legislative and regulatory reports on the issues that the Association is working on, many of which are in collaboration with PUD 1 staff.

Duckabush Change Order No. 2– Kristin presented a change order for the Duckabush project due to PUD requests and changes in the scope of the project, plus boring work for 3rd party telecom utilities, which amounts to $3,273 of the $5,130 total change order amount.

Ron made a motion to approve Duckabush Change Order No. 2 in the amount of $5,130; Mike seconded the motion. It passed unanimously.

August 2024 Financials– Katie gave the August 2024 financial report.

Financial Highlights:

- Revenue – Gross Revenue was $1,158,450 for the month of August 2024.
- Expenditures –Gross expenditures were $847,177 for the month of August 2024.
- As of August 31, the PUD has $640,181 in grant reimbursements outstanding for ongoing projects, which is an equivalent of about 25 days of our cash on hand.

Financial Metrics as Compared with Prior Year:	**August 2024**	**August 2023**
Total General Cash and Investments	$1,095,210	$1,429,297
Current Ratio (Current Assets/Current Liabilities)	2.06 to 1	2.25 to 1
Debt Service Coverage (O&M/ Debt Service)	3.71	3.04
Long-Term Debt to Net Plant	25%	30%
Total Debt to Equity Ratio (Total Liabilities/Total Equity)	33%	38%
Long Term Debt to Equity Ratio (Long Term Debt / Total Equity)	29%	35%
Times Interest Earned Ratio (Earnings before Interest & Taxes/Total Interest)	6.34	4.13
Cash on Hand (Total Available Cash/Average Daily Costs)	43 Days (General) 180 Days (All Funds)	55 Days (General) 190 Days (All Funds)

Approve Integrated Resource Plan for 2024– Ron made a motion to approve the 2024 Integrated Resource Plan as presented; Mike seconded the motion. It passed unanimously.

Approve 3rd Quarter Write-Offs to Collections– Ron made a motion to approve the 3rd Quarter Write-Offs to Collections in the amount of $8,475.30; Mike seconded the motion. It passed unanimously.

Staff Reports –
General Manager – Kristin gave an update on the Duckabush relocation project and the work at the Manzanita Substation. She also gave an update on the several grant applications that staff is working on.

District Treasurer – Katie gave an update on the Washington Families Clean Energy Credit grant program. She said they applied $200 credits to 980 accounts and spent down about 80% of the grant allocation in the short window.

Water Resource Manager – Brandy reported that the pavers were going to be doing all the asphalt patching next week in the various areas. The crew is working on the lead service line inventory and completed the Lake Arrowhead in-house phase of construction for 2024. She said 11 contractors showed up to the pre-bid walkthrough for the Lake Arrowhead mainline project.

Legal Counsel – No report.

Correspondence – Kristin shared some news articles about the Public Works Board funding for the Manzanita Water Storage project and the customer appreciation event.

Board Reports –
Mike – Is attending the WPUDA Water Workshop this week.

Jack – Gave an update on Energy Northwest's Small Modular Reactor project.

Ron – Attended the Hood Canal Coordinating Council and the discussion of the Duckabush Project.

PUBLIC COMMENT – None.

EXECUTIVE SESSION – None.

Adjourned: 2:48 p.m.

Jack Janda, President **Ron Gold, Vice President** **Mike Sheetz, Secretary**

PUBLIC UTILITY DISTRICT #1 OF MASON COUNTY

WATER USE EFFICIENCY GOALS AND MEASURES – SEPTEMBER 2024

PROCESS OVERVIEW

Water Use Efficiency is a proactive approach to protect public health and water supplies. The Department of Health was directed by the Legislature to adopt an enforceable Water Use Efficiency Program (WUE) effective in January of 2007. The creation of a regulatory WUE program is intended to achieve a consistently high level of stewardship among all municipal water suppliers. The law establishes that all municipal water suppliers must use water more efficiently in exchange for water right certainty and flexibility to help them meet future demand.

One of the most important steps in using water efficiently is setting goals that can be measured. Goals provide a benchmark for achievement and play a significant role in defining the success of our water WUE program. The WUE program requires water systems to pay attention to their usage patterns by reporting annually and managing water loss. For most water systems, conserved water can be the least costly source for new supply.

The District must set WUE goals through a public process every six years and report annually on their performance to their customers and the DOH (WAC 246-290-830).

The average DSL for all Group A systems combined is approximately 18% (not including newly acquired systems). The standard set by the Municipal Water Law is 10% or less for each system. Systems are encouraged to meet this goal 3 years after the system is fully metered.

The number of measures required for a water system is based on the number of connections. All Mason PUD #1 water systems have less than 1000 connections, therefore, all systems must be assigned a minimum of 4 WUE measures.

Over the next 6 years, combined estimated water savings will be 27.8 million gallons.

Group A Systems

DSL Group	Count
GROUP 1	12
GROUP 2	10
GROUP 3	5
GROUP 4	2
GROUP 5	1
GROUP 6	5

PUBLIC UTILITY DISTRICT #1 OF MASON COUNTY

PROPOSED WATER USE EFFICIENCY GOALS AND MEASURES – SEPTEMBER 2024

GOAL GROUP 1: 10% or less Distribution System Leakage (DSL)

Production:

Goal 1: Maintain DSL levels to 10% or less.

Consumption:

Goal 1: Reduce summer peak daily demand by 1% per ERU in 6 years.

Goal 2: Maintain ADD and summer peak daily demand.

Measures:

- Identify and repair Leaks as soon as they are discovered.
- Educate all consumers about irrigation conservation and peak water demand twice a year.
- Conservation rate structure for all consumers.
- Consumption history shown on all water bills.
- Water conservation and landscape water use are part of the water policy.
- Water conservation information on the MCPUD1 Website.

GOAL GROUP 2: >10%-20% DSL

Production:

Goal 1: Reduce DSL to 10% or less in 6 years.

Goal 2: Reduce total annual water production by 1% per ERU in 6 years.

Goal 3: Reduce peak month production by 1% per ERU in 6 years.

Consumption:

Goal 1: Reduce ADD by a minimum of 1% in 6 years.

Goal 2: Reduce summer peak daily demand by 2% in 6 years.

Measures:

- Develop “Water Loss Control Action Plan”.
- Conservation rate structure for residential and commercial use.
- Identify and repair Leaks as soon as they are discovered.
- Educate all consumers about irrigation conservation and peak water demand twice a year.
- Consumption history shown on all water bills.
- Water conservation and landscape water use are part of the water policy.
- Water conservation information on the MCPUD1 Website

GOAL GROUP 3: >20%-30% DSL

Production:

Goal 1: Reduce DSL to 15% in 6 years.

Goal 2 : Reduce DSL to 10% in 12 years.

Goal 3: Reduce total annual water production by 1% in 6 years.

Goal 4: Reduce peak month production by 2% per ERU in 6 years.

Consumption:

Goal 1: Reduce ADD by a minimum of 1% in 6 years.

Goal 2: Reduce summer peak daily demand by 2% in 6 years.

Measures:

- Develop “Water Loss Control Action Plan”.
- Conduct an AWWA water audit.
- Identify and repair Leaks as soon as they are discovered.
- Educate all consumers about irrigation conservation and peak water demand twice a year.
- Conservation rate structure for all consumers.
- Consumption history shown on all water bills.
- Water conservation and landscape water use are part of the water policy.
- Water conservation information on the MCPUD1 Website

GOAL GROUP 4: >30%-40% DSL

Production:

Goal 1: Reduce DSL to 20% in 6 years.

Goal 2: Reduce DSL to 15% in 12 years.

Goal 3: Reduce total annual water production by 1% in 6 years.

Goal 4: Reduce peak month production by 2% per ERU in 6 years.

Consumption:

Goal 1: Reduce summer peak daily demand by 2% in 6 years.

Goal 2: Reduce peak month ADD by 2% in 6 years.

Measures:

- Develop “Water Loss Control Action Plan”.
- Conduct an AWWA water audit.
- Identify and repair Leaks as soon as they are discovered.
- Educate all consumers about irrigation conservation and peak water demand twice a year.
- Conservation rate structure for all consumers.
- Consumption history shown on all water bills.
- Water conservation and landscape water use are part of the water policy.
- Water conservation information on the MCPUD1 Website

GOAL GROUP 5: >40%-50% DSL

Production:

Goal 1: Reduce DSL to 25% in 6 years.

Goal 2: Reduce DSL to 15% in 12 years.

Goal 3: Reduce total annual water production by 1% in 6 years.

Goal 4: Reduce peak month production by 1% per ERU in 6 years.

Consumption:

Goal 1: Reduce peak daily demand by 2% per ERU in 6 years.

Goal 2: Reduce peak month ADD by 2% in 6 years.

Measures:

- Develop “Water Loss Control Action Plan”.
- Conduct an AWWA water audit.
- Identify and repair Leaks as soon as they are discovered.
- Educate all consumers about irrigation conservation and peak water demand twice a year.
- Conservation rate structure for all consumers.
- Consumption history shown on all water bills.
- Water conservation and landscape water use are part of the water policy.
- Water conservation information on the MCPUD1 Website

GOAL GROUP 6: Greater than 50% DSL

Production:

Goal 1: Reduce DSL by 50% of current level in 6 years.

Goal 2: Reduce DSL to 20% in 12 years.

Goal 3: Reduce total annual water production by 1% per ERU in 6 years.

Goal 4: Reduce peak month production by 2% per ERU in 6 years.

Consumption:

Goal 1: Reduce summer peak daily demand by 3% per ERU in 6 years.

Goal 2: Reduce peak month ADD by 2% in 6 years.

Measures:

- Develop “Water Loss Control Action Plan”.
- Conduct an AWWA water audit.
- Identify and repair Leaks as soon as they are discovered.
- Educate all consumers about irrigation conservation and peak water demand twice a year.
- Conservation rate structure for all consumers.
- Consumption history shown on all water bills.
- Water conservation and landscape water use are part of the water policy.
- Water conservation information on the MCPUD1 Website.

APPENDIX I

SUSCEPTIBILITY ASSESSMENT

Washington State Department of Health
Environmental Health Programs
Division of Drinking Water

Ground Water Contamination
Susceptibility Assessment Survey Form

Complete **one** form for **eac**h ground water source (well, wellfield, spring) used in your water system (photocopy as necessary).

PART I: System Information

Well owner/manager: Mason County PUD 1

Water system name: Wonderland Water System

County: Mason

Water system ID number: 98128K Source number: S01
Well depth: 230 feet

Source name: Well #1

WA well identification tag number: AHB625
❑ Well not tagged

Number of connections: 34 Population served: 88

Township: 21 Range: 02W

Section: 29 ¼ ¼ Section: NESW

Latitude/longitude (if available):_____/_____

How was latitude/longitude determined?

_____Global positioning device_____survey_____topographical map
_____other:_____

*Please refer the instructions for details and explanations of all questions in Parts II through V.

PART II: Well Construction and Source Information

1) Date well originally constructed: 3/7/1973 month/day/year

last reconstruction: ___/___/___month/day/year

❑ Information unavailable

2) Well driller: Bedell Drilling Co.

❑ Well driller unknown

3) Type of well: ___ Drilled: ❑ rotary ❑ bored ✓cable (percussion) ❑ Dug

___ other: ❑ spring(s) ❑ lateral collector (Ranney)

❑ driven ❑ jetted ❑ other:_____

4) Well report available ✓ Yes (attach copy to form) ❑ No

5) Average pumping rate: _____(gallons/min)

Source of information_____

If not documented, how was pumping rate determined?_____

_____

❑ Pumping rate unknown

Commented [JL1]: Unsure what the average is? How to find?

6) Is this source treated?

If so, what type of treatment:

❑ disinfection ❑ filtration ❑ carbon filter ❑ air stripper ❑ other

Purpose of treatment (describe materials to be removed or controlled by treatment):

_____

_____

7) If source is chlorinated, is a chlorine residual maintained: ❑ Yes ✓ No

Residual level:_____ (At the point closest to the source.)

PART III: Hydrogeologic Information

1) Depth to top of open interval: [check one]

❑ <20 ft ❑ 20-50ft ❑ 50-100ft ✓ 100-200ft ❑ >200ft

❑ information unavailable

2) Depth to ground water (static water level):

❑ <20ft ❑ 20-50ft ❑ 50-100ft ✓ >100ft

❑ flowing well/spring (artesian)

How was water level determined?

✓ well log ❑ other _____

❑ depth to ground water unknown

3) If source is a flowing well or spring, what is the confining pressure:

0 psi (pounds per square inch) **or**

_____feet above wellhead

4) If source is a flowing well or spring, is there a surface impoundment, reservoir, or catchment associated with this source: ❑ Yes ✓ No

5) Wellhead elevation (height above mean sea level): 240 feet

How was elevation determined? ✓ topographic map ❑ Drilling/Well Log ❑ altimeter

❑ other:_____

❑ information unavailable

6) Confining layers: (This can be completed only for those sources with a drilling log, well log or geologic report describing subsurface conditions. Please refer to assistance package for example.)

_____ evidence of a confining layer in well log

Check no evidence of a confining layer in well log

If there is evidence of a confining layer, is the depth to ground water more than 20 feet above the **bottom** of the **lowest confining layer**? ❑ Yes ❑ No

❑ information unavailable

7) Sanitary setback:

❑ < 100ft* ❑ 100-120ft ❑ 120-200 ft ❑ >200ft

* If less than 100ft, describe the site conditions:

8) Wellhead construction:

- ✓ wellhead enclosed in a wellhouse
- ❑ controlled access (describe): _____
- ❑ other uses for wellhouse (describe): _____
- ❑ no wellhead control

9) Surface seal: 22 ft

- ❑ 18 ft
- ❑ <18 ft (no Department of Ecology approval)
- ❑ <18 ft (Approved by Ecology, include documentation)
- ❑ depth of seal unknown
- ❑ no surface seal

10) Annual rainfall (inches per year):

❑ <10 in/yr ❑ 10-25 in/yr ✓ >25 in/yr

PART IV: Mapping Your Ground Water Resource

1) Annual volume of water pumped:_____ (gallons)

How was this determined?
- ❑ meter
- ❑ estimated: ❑ pumping rate (_____)
  ❑ pump capacity (_____)
- ❑ other:_____

2) "Calculated Fixed Radius" estimate of ground water movement:
(see Instruction Packet)

6-month ground water travel time: 258 feet

1-year ground water travel time: 365 feet

5-year ground water travel time: 815 feet

10-year ground water travel time: 1153 feet

Information available on length of screened/open interval?
✓ Yes ❑ No

Length of screened/open interval: 5 feet

3) Is there a river, lake, pond, stream, or other obvious surface water body within the 6- month time of travel boundary?
❑ Yes ✓No (mark and identify on map)

4) Is there a stormwater and/or wastewater facility, treatment lagoon, or holding pond located within the 6-month time of travel boundary?
❑ Yes ✓No (mark and identify on map)

Comments:_____

PART V: Assessment of Water Quality

1) **Regional sources of risk to ground water**:

Please indicate if any of the following are present within a circular area around your water source having a radius up to and including the five-year ground water travel time. If you do not know if one of the following is present, mark the "unknown" space.

	6-month	1-year	5-year	unknown
• likely pesticide application	_____	_____	_____	_____
• stormwater injection wells	_____	_____	_____	_____
• other injection wells	_____	_____	_____	_____
• abandoned ground water well	_____	_____	_____	_____
• landfills, dumps, disposal areas	_____	_____	_____	_____
• known hazardous materials clean-up site	_____	_____	_____	_____
• water system(s) with known quality problems	_____	_____	_____	_____
• population density >1 house/acre	_____	_____	_____	_____
• residences commonly have septic tanks	_____	_____	_____	_____
• Wastewater treatment lagoons	_____	_____	_____	_____
• sites used for land application of waste	_____	_____	_____	_____

Mark and identify on map any of the risks listed above which are located within the 6-month time of travel boundary. (Please include a map of the wellhead and time of travel areas with this form. Please locate and mark any of the following.)

If other recorded or potential sources of ground water contamination exist within the ten-year time of travel circular zone around your water supply, please describe:

_____

_____

_____

_____

_____

_____

2) **Source-specific water quality records**: For each type of test below, mark the row that applies to the sample results for this source. Consider all the sample results from the past 12 years. (MCLs are noted next to the specific test or listed in assistance package.)

A. **Nitrate:** (Nitrate MCL = 10 mg/l)

Results greater than MCL	_____
<2 mg/liter nitrate	✓_____
2-5 mg/liter nitrate	_____
<5 mg/liter nitrate	_____
Nitrate sampling records unavailable	_____

B. **VOCs:** (VOC detection level is 0.5 ug/l or 0.0005 mg/l)

Results greater than MCL or SAL	_____
VOCs detected at least once	_____
VOCs never detected	✓_____
VOC sampling records unavailable	_____

C. **EDB/DBCP:**
(EDB MCL = 0.05 ug/l or 0.00005 mg/l. DBCP MCL = 0.2 ug/l or 0.0002 mg/l.)

EDB/DBCP detected below MCL at least once	_____
EDB/DBCP detected above MCL at least once	_____
EDB/DBCP never detected	_____
EDB/DBCP tests required but not yet completed	_____
EDB/DBCP tests not required	✓_____

D. **Other SOCs (Pesticides):**

Other SOCs detected (pesticides and other synthetic organic chemicals)	_____
Other SOC tests performed but none detected (list test methods in comments)	✓_____
Other SOC tests not performed	_____

If any SOCs in addition to EDB/DBCP were detected, please identify and date. If other SOC tests were performed, but no SOCs detected, list test methods here:_____

_____

_____

_____

E. **Bacterial contamination:**

Any bacterial detection(s) in the past 3 years in samples taken from the source (not distribution sampling records)? _____

Has source (in past 3 years) had a bacteriological contamination problem found in distribution samples that was attributed to the source? _____

Source sampling records for bacteria unavailable _____

PART VI: Geographic or Hydrologic Factors Contributing to a Non-Circular Zone of Contribution

The following questions will help identify those ground water systems which may not be accurately represented by the calculated fixed radius (CFR) method described in Part IV. For these sources, the CFR areas should be used as a preliminary delineation of the critical time of travel zones for that source. As a system develops its Wellhead Protection Plan for these sources, a more detailed delineation method should be considered.

1) Is there evidence of obvious hydrologic boundaries within the 10-year time of travel zone of the CFR? (Does the largest circle extend over a stream, river, lake, up a steep hillside, and/or over a mountain or ridge?)

❑ Yes ❑ No

Describe with references to map produced in Part IV:

Figure 5-1 shows the 10 year time of travel zone of the CFR

_____

_____

_____

2) Aquifer Material:

A) Does the drilling log, well log or other geologic/engineering reports identify that the well is located in an area where the underground conditions are identified as fractured rock and/or basalt terrain?

❑ Yes ✓ No

B) Does the drilling log, well log or other geologic/engineering reports indicate that the well is located in an area where the underground conditions are primarily identified as coarse sand and gravel?

✓ Yes ❑ No

3) Is the source located in an aquifer with a high horizontal flow rate? (These can include sources located on flood plains of large rivers, artesian wells with high water pressure, and/or shallow flowing wells and springs.)

❑ Yes ❑ No

4) Are there other high capacity wells (agricultural, municipal and/or industrial) located within the CFRs?

a) Presence of ground water extraction wells removing more than approximately 500 gal/min within…

	YES	NO	unknown
<6-month travel time	_____	✓_____	_____
6 month—1 year travel time	_____	✓_____	_____
1—5 year travel time	_____	✓_____	_____
5—10 year travel time	_____	✓_____	_____

b) Presence of ground water recharge wells (dry wells) or heavy irrigation within…

	YES	NO	unknown
<1-year travel time	_____	_____	_____
1—5 year travel time	_____	_____	_____
5—10 year travel time	_____	_____	_____

Please identify or describe additional hydrologic or geographic conditions that you believe may affect the shape of the zone of contribution for this source. Where possible, reference them to locations on the map produced in Part IV.

_____

_____

_____

_____

_____

_____

_____

FORM COMPLETED BY:

_____ _____

Print Name Date

_____

Signature

APPENDIX J

CIP COST ESTIMATES

Mason County PUD No. 1
Wonderland Water System
Reservoir (R-1) and BPS (BP-1)
July 1, 2025

NO.	ITEM	QUANTITY		UNIT PRICE	AMOUNT
1	Mobilization and Demobilization	1	LS	$104,517	$104,517
2	Minor Changes	1	CALC	$25,000	$25,000
3	Temporary Erosion and Sediment Control	1	LS	$4,000	$4,000
4	Trench Excavation Safety Systems	1	LS	$4,000	$4,000
5	Locate Existing Utilities	1	LS	$4,000	$4,000
6	Unsuitable Excavation	20	CY	$70	$1,400
7	Clearing and Grubbing	1	LS	$5,000	$5,000
8	Crushed Surfacing Top Course	0	TN	$40	$0
9	Sitework	1	LS	$30,000	$30,000
10	Pump Station Building	1	LS	$72,000	$72,000
11	Booster Pump 65 GPM	2	EA	$25,000	$50,000
12	Piping, Valves, and Appurtenances	1	LS	$200,000	$200,000
13	94,000 -Gallon Concrete Reservoir, Complete	1	LS	$365,000	$365,000
14	Generator and Automatic Transfer Switch	1	LS	$100,000	$100,000
15	Electrical, Telemetry, and Instrumentation	1	LS	$120,000	$120,000
16	Restoration	1	LS	$15,000	$15,000
	Subtotal (Rounded)				$1,099,917
	Contingency	30%			$329,975
	Subtotal (Rounded)				$1,429,892
	Washington State Sales Tax (Rounded)	8.80%			$125,830
	Subtotal (Rounded)				$1,555,700
	Engineering, Permiting, and Construction Administration		25%		$388,900
	Total Estimated Project Cost (Rounded):				**$1,944,600**

Mason County PUD No. 1
Wonderland Water System
Pilot Study (TF-1) and Treatment Facility (TF-2)
July 1, 2025

NO.	ITEM	QUANTITY		UNIT PRICE	AMOUNT
1	Mobilization and Demobilization	1	LS	$73,437	$73,437
2	Minor Changes	1	CALC	$25,000	$25,000
3	Temporary Erosion and Sediment Control	1	LS	$4,000	$4,000
4	Trench Excavation Safety Systems	1	LS	$4,000	$4,000
5	Locate Existing Utilities	1	LS	$4,000	$4,000
6	Unsuitable Excavation	20	CY	$70	$1,400
7	Clearing and Grubbing	1	LS	$5,000	$5,000
8	Crushed Surfacing Top Course	0	TN	$40	$0
9	Sitework	1	LS	$90,000	$90,000
10	Filter Building	1	LS	$160,000	$160,000
11	Iron and Managanese Filtration System	1	LS	$131,000	$131,000
12	Backwash Pond	1	LS	$10,000	$10,000
13	Piping, Valves, and Appurtenances	1	LS	$100,000	$100,000
14	Electrical, Telemetry, and Instrumentation	1	LS	$150,000	$150,000
15	Restoration	1	LS	$15,000	$15,000
	Subtotal (Rounded)				$772,837
	Contingency	30%			$231,851
	Subtotal (Rounded)				$1,004,688
	Washington State Sales Tax (Rounded)	8.80%	.....		$88,410
	Subtotal (Rounded)				$1,093,100
	Engineering, Permiting, and Construction Administration		25%		$273,300
	Total Estimated Project Cost (Rounded):				**$1,366,400**

Mason County PUD No. 1
Wonderland Water System
Wicked Delights Water Connection Line (D-1)
July 1, 2025

NO.	ITEM	QUANTITY		UNIT PRICE	AMOUNT
1	Mobilization and Demobilization	1	LS	$16,000	$16,000
2	Temporary Erosion and Sediment Control	1	LS	$2,000	$2,000
3	Trench Excavation Safety Systems	1	LS	$2,000	$2,000
4	Locate Existing Utilities	1	LS	$2,000	$2,000
5	Unsuitable Excavation	50	CY	$70	$3,500
6	4-inch HDPE Water Main (Including Bedding	550	LF	$60	$33,000
7	4-inch Gate Valves	2	EA	$1,500	$3,000
8	Additional Fittings	50	LB	$5	$250
9	Saw Cutting	1,105	LF	$5	$5,525
10	Bankrun Gravel For Trench Backfill	168	TN	$50	$8,403
11	Crushed Surfacing Top Course	47	TN	$50	$2,353
12	HMA	47	TN	$200	$9,411
13	Connection To Existing	1	EA	$2,000	$2,000
14	Traffic Control	1	LS	$50,000	$50,000
15	Restoration	1	LS	$20,000	$20,000
	Subtotal (Rounded)				$159,000
	Contingency	30%			$47,700
	Subtotal (Rounded)				$206,700
	Washington State Sales Tax (Rounded)	8.80%			$18,190
	Subtotal (Rounded)				$224,900
	Engineering, Permiting, and Construction Administration		25%		$56,200
	Total Estimated Project Cost (Rounded):				**$281,100**

APPENDIX K

RATE SCHEDULE

WATER RATE SCHEDULE For 2025

Revised December 28, 2023/Established 2000

RESIDENTIAL & SMALL COMMERCIAL
RATE CLASS

METERED RATE-CUBIC FEET:

First 400 cu. ft. or less	$65.63/month
401 to 1000 cu. ft.	$2.64/100 cu. ft
1001 cu. ft. & above	$3.29/100 cu. Ft

METERED RATE-GALLONS:

First 3000 gallons or less	$65.63/month
3001 to 7500 gallons	.003529/gallon
7501 gallons & above	.004398/gallon

IRRIGATION:

Meter Charge	$6,067.54
Usage Charge ($ per CCF)	$1.71

System Development Fee $4,733.00

***A System Development Fee does not mean that there are available hook-ups for new services. Please contact Mason County PUD #1 for information on availability at 360- 877-5249 or 1-800-544-4223*

Fill Charge $7.16

MISCELLANEOUS CUSTOMER CHARGES

Service Set-up Charge	$ 3.00
SECURITY DEPOSITS-	
Owner/Non-Owner Residential (Without Satisfactory Credit Check)	$ 100.00*
General Service Customers (Without Satisfactory Credit Check)	$ 100.00*
Prior Disconnect/Bad Credit History	$ 200.00*
Irrigation (Industry standard usage if not available)	2 month average high

* OR Two Month High -Whichever is greater

OTHER CHARGES

Disconnect Non-Pay or Field Collection	$ 75.00
Reconnect Service during Working Hours	$ 75.00
Reconnect during non-working hours or check on customer outages (no charge for utility problems)	$ 300.00
Disconnect and Reconnect Within 3 Years	Basic Service Charge For Each Month the Service Is Disconnected
Disconnect and Reconnect after 3 Years	1/2 half of the System Development Fee
Late charge on unpaid balance over 30 days	1.5%
Smart Meter Opt Out Can have meter manually read every month	$ 25.00/month
NSF Fee	$ 50.00
Meter Tampering	
**Cut or missing seal plus reconnect fee of $75.00	$ 200.00
**Unauthorized connect or reconnect of meter plus usage and reconnect fee of 75.00	$ 250.00
**Water Diversion plus estimated water used	$ 1250.00
Associated Service Charge, Fees, Expenses from Local, State of Federal Agencies	Actual Cost
Temporary Service (Installation/Removal)	Actual Cost
Crew/Servicemen Standby (Customer Request)	Actual Cost
Customers Damage to District's Property	Actual Cost
Hydrant Use	
Use Fee	$ 100.00
Six-Month Permit	$ 600.00

METER INSTALLATION FEES

5/8-Inch or 3/4-Inch	Actual Cost
1-Inch	Actual Cost
1 1/2-Inch	Actual Cost
2-Inch and Above	Actual Cost

APPENDIX L

WELLHEAD PROTECTION ZONE LETTERS

PUBLIC UTILITY DISTRICT NO. 1
OF MASON COUNTY
N. 21971 Hwy. 101
Shelton, Washington 98584

BOARD OF COMMISSIONERS
MIKE SHEETZ, Commissioner
JACK JANDA, Commissioner
RON GOLD, Commissioner

WELL HEAD PROTECTION NOTICE

Wonderland Water System
September 2025

Dear Emergency Responders,

The purpose of this letter is to inform you about the Wellhead Protection Areas (WHPA) in the Wonderland water system. The WHPA is based on Washington Department of Health WAC 246-290-135(3) regulations.

As part of this plan, the District must provide wellhead protection notices to agencies responsible for incidents or spill response procedures. It is important that you are aware of where potential contaminates releases could adversely impact the quality of Wonderland water system drinking water supply.

The enclosed map shows the boundaries for the wellhead protection area. Any groundwater contamination that occurs within this wellhead protection area has a high potential to reach one or more of our wells.

In the event of a spill or contaminant release, please notify Mason County PUD No. 1 and Department of Ecology.

Please contact me at (360) 877-5249 if you have any questions.

Sincerely,

Brandy Milroy
Water Resource Manager

Enc: Well Head Protection Zone Map for Wonderland Water System
cc: WSDOH and Wonderland Water System Well Head Protection File

PUBLIC UTILITY DISTRICT NO. 1
OF MASON COUNTY
N. 21971 Hwy. 101
Shelton, Washington 98584

BOARD OF COMMISSIONERS
MIKE SHEETZ, Commissioner
JACK JANDA, Commissioner
RON GOLD, Commissioner

WELL HEAD PROTECTION NOTICE

Wonderland Water System
September 2025

Dear Customers,

The purpose of this letter is to inform you about the Well Head Protection Zones in the Wonderland water system. The water source (well) are protected by a 100-foot covenant radius, within which no sources of contamination are allowed and are ranked by the Washington State Department of Health as "moderate" susceptibility, meaning they are not extremely susceptible to contamination, nor are they extremely well protected from contaminations, due to the natural geology of the area.

Beyond the 100-foot covenant areas, are the wellhead protections zones. Private properties may be located within the well head protection zones, which are greater than the 100-foot radius, and care should be taken to avoid contaminating the soil and groundwater. Septic maintenance is key to achieving this. A properly used and operating septic tank and drain field system should not pose a significant threat to wells more than a few hundred feet from the drain field. However, septic tanks and drain fields are not designed for disposal of solvents, paint thinners, antifreeze, motor oil, or other chemical wastes. Therefore, disposal of any such inappropriate waste to your septic tanks/drain field system or unproperly disposed of at all, could potentially contaminate groundwater and impact the wells in the area.

The enclosed map shows the six-month and one, five and 10-year "time-of-travel" boundaries for the wellhead protection area. Any groundwater contamination that occurs within this wellhead protection area has a high potential to reach one or more of our wells.

The PUD asks our customers and neighbors to please be diligent in protecting the well covenant zones. Visit Mason County's website for information on how to properly dispose of hazardous wastes. They accept some household hazardous wastes for free on weekends.

http://www.co.mason.wa.us/utilities-waste/solid-waste/garbage-disposal.php

Please contact me at (360) 877-5249 if you have any questions.

Sincerely,

Brandy Milroy
Water Resource Manager
Enc: Well Head Protection Zone Map for Wonderland Water System
cc: WSDOH and Wonderland Water System Well Head Protection File

PUBLIC UTILITY DISTRICT NO. 1
OF MASON COUNTY
N. 21971 Hwy. 101
Shelton, Washington 98584

BOARD OF COMMISSIONERS
MIKE SHEETZ, Commissioner
JACK JANDA, Commissioner
RON GOLD, Commissioner

WELL HEAD PROTECTION NOTICE

Wonderland Water System
September 2025

Dear DOE,

The purpose of this letter is to inform you about the Wellhead Protection Areas (WHPA) in the Wonderland water system. The WHPA is based on Washington Department of Health WAC 246-290-135(3) regulations.

The enclosed map of the WHPA boundary, source well, and potential contaminant sources. Also included is a list with names and locations for each site. Please review the map and use it as a reference when inspecting and permitting the storage, use, and disposal of hazardous material within our WHPA.

In the event of a spill or contaminant release, please notify Mason County PUD No. 1 and Department of Ecology.

Please contact me at (360) 877-5249 if you have any questions.

Sincerely,

Brandy Milroy
Water Resource Manager

Enc: Well Head Protection Zone Map for Wonderland Water System
cc: WSDOH and Wonderland Water System Well Head Protection File

item	parcel no.	parcel address 1	parcel address 2	owner address 1	owner address 2	owner	Inside RSA	Inside ZOC
1	221295100012	100 E MAJESTYS CT	SHELTON WA 98584			DOIDGE, ROBY E & JANE M	Y	Y
2	221295100011	70 E MAJESTY CT	SHELTON WA 98584			MOYER, MICHAEL ALLAN & DEBRA LEE	Y	Y
3	221295100010	30 E MAJESTYS CT	SHELTON WA 98584	11814 SHERIDAN AVE S	TACOMA WA 98444	DALRYMPLE, PAMELA A	Y	Y
4	221295100013	101 E MAJESTYS CT	SHELTON WA 98584			HUSTIS, MATTHEW S & SARAH	Y	Y
5	221295100014	71 E MAJESTYS CT	SHELTON WA 98584			RAYEVICH, DONNA	Y	Y
6	221295100015	51 E MAJESTY CT	SHELTON WA 98584			MIRKA, GARY L	Y	Y
7	221295100009	231 E QUEENS WAY	SHELTON WA 98584			SISSON, DEBRAH LYNN	Y	Y
8	221295100008	241 E QUEENS WAY	SHELTON WA 98584			GODWIN, BEVERLY C	Y	Y
9	221295200013	261 E QUEENS WAY	SHELTON WA 98584			BUHL, THOMAS ALAN	Y	Y
10	221295200012	291 E QUEENS WAY	SHELTON WA 98585			KENNY, JAMES W & MARIE A	Y	Y
11	221295200011	311 E QUEENS WAY	SHELTON WA 98586			SANCHEZ, JORGE	Y	Y
12	221295200010	331 E QUEENS WAY	SHELTON WA 98587			SALEMA, ANTHONY	Y	Y
13	221295200009	330 E QUEENS WAY	SHELTON WA 98588			FULTON, MELISSA	Y	Y
14	221295200008	300 E QUEENS WAY	SHELTON WA 98589	P O BOX 332		COOPER, TERRY	Y	Y
15	221295200007	262 E QUEENS WAY	SHELTON WA 98590			ARY REVOCABLE LIVING TRUST, LAURA C ARY TRS	Y	Y
16	221295200007	260 E QUEENS WAY	SHELTON WA 98591			ARY REVOCABLE LIVING TRUST, LAURA C ARY TRS	Y	Y
17	221295100007	230 E QUEENS WAY	SHELTON WA 98592			HAMMOND, KRISTIE A	Y	Y
18	221295100006	170 E QUEENS WAY	SHELTON WA 98593			BRAUER, BRUCE K	Y	Y
19	221295100005	140 E QUEENS WAY	SHELTON WA 98594	820 FOLLIN LN SE	VIENNA VA 221804907	NAVY FEDERAL CREDIT UNION, ATT:LINDA GREENFIELD	Y	Y
20	221295100016	21 E MAJESTYS CT	SHELTON WA 98595	4981 MERIWOOD DR NW	LACEY WA 98516	H&R MIDDLETON PROPERTIES LLC,	Y	Y
21	221295100017	141 E QUEENS WAY	SHELTON WA 98596	PO BOX 232	SHELTON WA 98584-0232	MCCLURE, VIRGINIA L	Y	Y
22	221295100018	101 E QUEENS WAY	SHELTON WA 98597	161 E BOARDWALK	SHELTON WA 98584	PHILPOTT, MYSTIQUE	Y	Y
23	221295100019	81 E QUEENS WAY	SHELTON WA 98598	461 NE PINE CAMP RD	BELFAIR WA 98528	PACE, NATALIE JUNE & SEAN BRADLEY ALBERT	Y	Y
24	221295100020	61 E QUEENS WAY	SHELTON WA 98599	171 E BERTLESEN RD	SHELTON WA 98584	HYLTON, JACK L JR	Y	Y
25	221295100021	31 E QUEENS WAY	SHELTON WA 98600			CARLSEN, JILL & DENNIS	Y	Y
26	221293190002	341 E PICKERING RD	SHELTON WA 98601	2494 E PICKERING RD		JONES REVOCABLE LIVING TRUST, ALFRED W JONES & DEBRA A JONES CO-	Y	Y
27	221293190003	321 E PICKERING RD	SHELTON WA 98602			WESTON, JEANNE M	Y	Y
28	221293190001	323 E PICKERING RD	SHELTON WA 98603	P O BOX 1761	PORT TOWNSEND WA 98368	HOFF ET UX, ROBERT ANDREA HEGLAND	Y	Y
29	221295100004	100 E QUEENS WAY	SHELTON WA 98604	P O BOX 122	ZORTMAN MT 59546	HOWLAND, DAVID W	Y	Y
30	221295100003	80 E QUEENS WAY	SHELTON WA 98605			DANIEL, JARED	Y	Y
31	221295100002	50 E QUEENS WAY	SHELTON WA 98606			THOMPSON, CHRIS E & CHRISTINE L	Y	Y
32	221295100001	30 E QUEEN WAY	SHELTON WA 98607			PERRINE ET UX, CHARLES S SHAUNA MURPHY	Y	Y
33	221295200001	70 E KINGS WAY	SHELTON WA 98608			STEPHENS, PAMELIA SUE & JEFFEREY DAVID	Y	Y
34	221295200002	541 E PICKERING RD	SHELTON WA 98609			O'SULLIVAN, JOHN G & PATRICIA R	Y	Y
35	221295200002	543 E PICKERING RD	SHELTON WA 98610			O'SULLIVAN, JOHN G & PATRICIA R	Y	Y
36	221295200002	545 E PICKERING RD	SHELTON WA 98611			O'SULLIVAN, JOHN G & PATRICIA R	Y	Y
37	221295200003	130 E KINGS WAY	SHELTON WA 98612			ZORER, KRISTOPHER & AMBERLE	Y	Y
38	221295200004	131 E KINGS WAY	SHELTON WA 98613			TWIDWELL, GABRIEL E & JOSHUA K	Y	Y
39	221295200005	101 E KINGS WAY	SHELTON WA 98614			O'CONNELL, NEAL & JOLENE	Y	Y
40	221295200006	51 E KINGS WAY	SHELTON WA 98615			BROZEK ET UX, ROBERT J JANETTE M LAMBERT	Y	Y
41	221292460000		SHELTON WA 98616	411 N 5TH ST	SHELTON WA 98584	MASON COUNTY, MASON COUNTY COURTHOUSE	Y	Y
42	221292400010	8540 E STATE ROUTE 3	SHELTON WA 98617			WISNIEWSKI, DAVID W & LIBERTY	Y	Y
43	221292460000		SHELTON WA 98618	411 N 5TH ST	SHELTON WA 98584	MASON COUNTY, MASON COUNTY COURTHOUSE	Y	Y
44	221292450010	8393 E STATE ROUTE 3	SHELTON WA 98619			SHOEMAKER, DAVID & KARYLIN	Y	Y
45	221292450020	8391 E STATE ROUTE 3	SHELTON WA 98620			ENGER, MELVIN D & CATHY A	Y	Y
46	221292450030		SHELTON WA 98621	1161 E BERTELSEN RD	SHELTON WA 98584	ENGER, RONALD D	Y	Y
47	221291300010	8630 E STATE ROUTE 3	SHELTON WA 98622			ALONZO, LEMUEL	Y	N
48	221291300000		SHELTON WA 98623	8809 LENOX POINTE DR SUITE B	CHARLOTTE NC 28273-3377	GREEN DIAMOND RESOURCE COMPANY,	Y	N
49	221291400000		SHELTON WA 98624	8809 LENOX POINTE DR SUITE B	CHARLOTTE NC 28273-3377	GREEN DIAMOND RESOURCE COMPANY,	Y	N
50	221293004000		SHELTON WA 98625	8809 LENOX POINTE DR SUITE B	CHARLOTTE NC 28273-3377	GREEN DIAMOND RESOURCE COMPANY,	Y	Y
51	221293004000		SHELTON WA 98626	8809 LENOX POINTE DR SUITE B	CHARLOTTE NC 28273-3377	GREEN DIAMOND RESOURCE COMPANY,	N	Y
52	221293490010		SHELTON WA 98627	P O BOX 1008	HOODSPORT WA 98548	C AND R PROPERTIES LLC	Y	Y
53	221293490040	410 E PICKERING RD	SHELTON WA 98628	2494 E PICKERING RD	SHELTON WA 98584	JONES REVOCABLE LIVING TRUST, ALFRED W JONES & DEBRA A JONES CO-TRUSTEES	N	Y