TOWN OF CATHLAMET

WAHKIAKUM COUNTY **WASHINGTON**

WATER SYSTEM PLAN

G&O #22229
APRIL 2023

Gray & Osborne, Inc.
CONSULTING ENGINEERS

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WAHKIAKUM COUNTY **WASHINGTON**

Town of CATHLAMET Washington

WATER SYSTEM PLAN

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WATER SYSTEM DESCRIPTION

INTRODUCTION

In accordance with Washington Administrative Code (WAC) 246-290-100 and the Washington State Department of Health (DOH), water system plans need to be updated every 10 years or more frequently, if necessary, to reflect the current conditions of the water system.

This Plan has been prepared in accordance with WAC 246-290. The Town of Cathlamet (Town) has an existing Water System Plan that was approved by the Washington State Department of Health in October 2015. This Plan is being prepared to update the information and planning data to remain in compliance with WAC 246-290-100.

Other primary references employed to prepare this Plan include the DOH Water System Design Manual, June 2020; and the DOH Water System Planning Guidebook, August 2020.

The purpose of this Plan is to assist the Town in developing long term water service planning strategies. The Plan that follows evaluates the existing water system and its ability to meet the anticipated State and Federal requirements for water source, quality, treatment, transmission, distribution, and storage. This Plan will evaluate the system capacity into the 10- and 20-year planning period, to the end of years 2033 and 2043, respectively.

A vicinity map showing the Town of Cathlamet is included as Figure 1-1.

GOALS

Water system planning is essential to good management of a water system. This water system plan has been prepared to meet the following objectives.

- Ensure efficient use of available water resources.
- Coordinate planning efforts for growth and development with available water resources.
- Document existing system infrastructure and identify current and future system needs.
- Provide information that will help to ensure that safe, high quality drinking water is delivered to existing and future system customers.

- Ensure reliable service during all conditions of operation.

WATER SYSTEM OWNERSHIP AND MANAGEMENT

Per the DOH Water Facilities Inventory (WFI), the name of the system is "Cathlamet Water Dept." and the water system identification number is 11850D. A copy of the WFI is included in Appendix A.

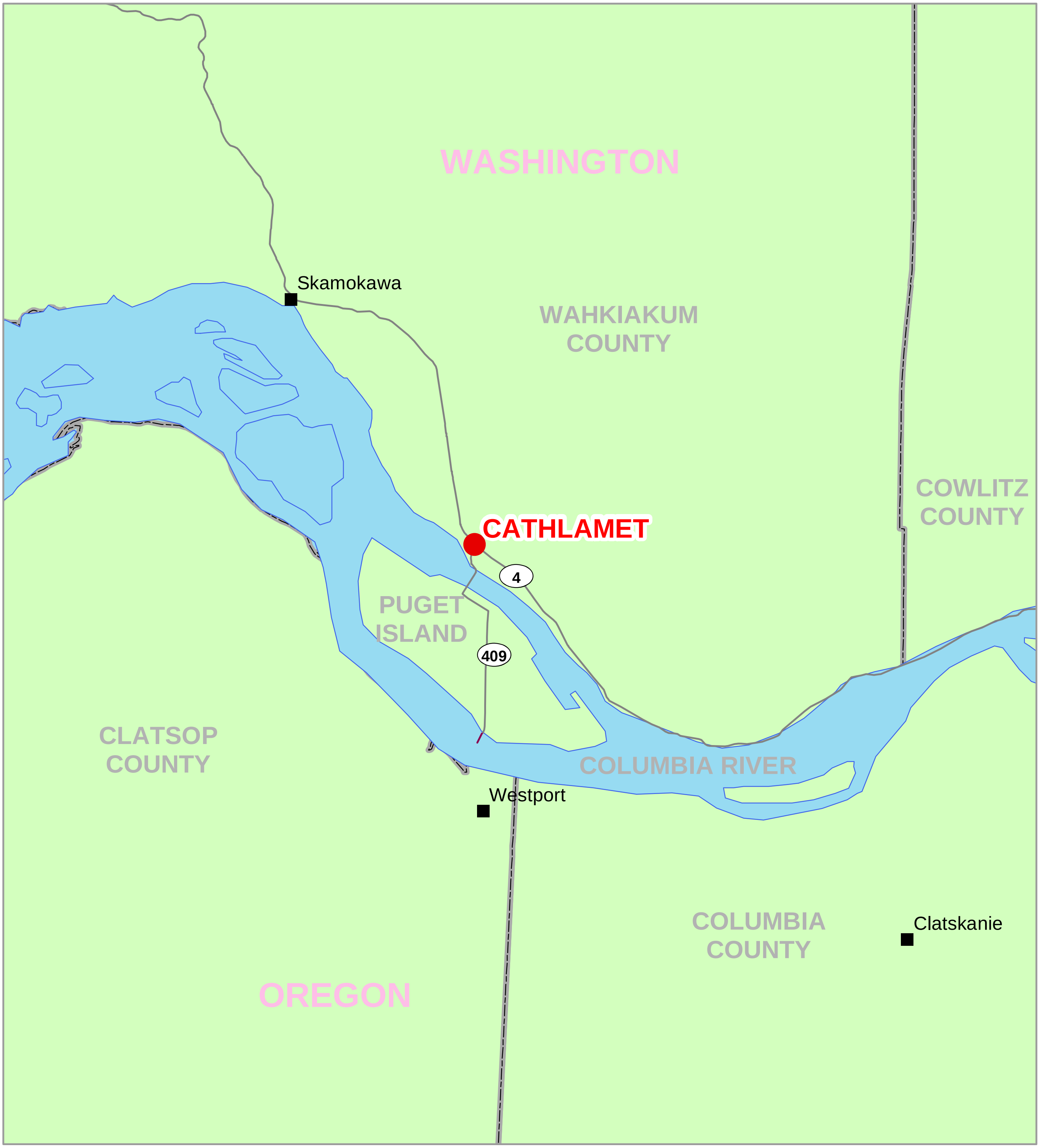
The Town is located in Wahkiakum County. The water system is designated as a Group A by DOH and is owned and operated by the Town of Cathlamet. The current mailing address for the water system is:

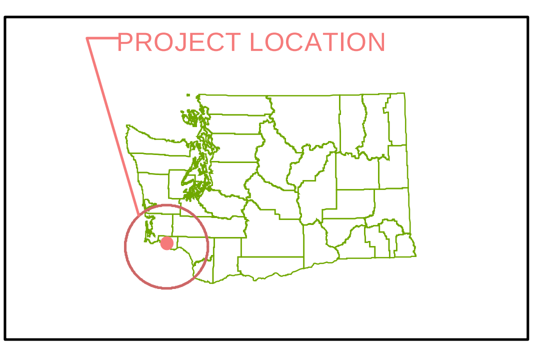
Town of Cathlamet
375 2nd Street
Cathlamet, Washington 98612
Phone (360) 795-8032

Waterworks operator certification, regulated under WAC 246-292, dictates that public water systems in Washington State with more than 100 services retain in their employment individuals who are certified, by examination, as competent in water supply operation and management. The water system is managed by the Public Works Superintendent who supervises two full-time public works employees. These three individuals maintain and operate the water system, sewer system, streets, and parks. The Water System Manager reports to the Mayor who has overall administrative authority for Town functions. The Mayor in turn reports to the Town Council, which is responsible for program overview and policy decision-making. At the writing of this Plan the Mayor, Council members, and staff are as follows:

Mayor	David Olson
Council Member	Robert Stowe
Council Member	Kermit Chamberlin
Council Member	CeCelia Raglin
Council Member	Jeanne Hendrickson
Council Member	Laurel Waller
Clerk Treasurer	Sarah Clark
Attorney	Fred Johnson
Public Works Superintendent	David McNally

Additional information on water system operator certification is provided in Chapter 6.





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TOWN OF CATHLAMET

WATER SYSTEM PLAN
FIGURE 1-1
LOCATION MAP

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SYSTEM BACKGROUND

HISTORY OF WATER SYSTEM DEVELOPMENT AND GROWTH

The Town of Cathlamet is located in Wahkiakum County along the Columbia River approximately 32 miles from the Pacific Ocean and 70 miles northwest of the City of Vancouver. Located along State Route 4, the Town was established as Birnie's Retreat in 1846 as a trading post.

The water system was developed in the early 1900s to serve water to residents in the Town. In October of 1941, the Wahkiakum Public Utilities District (PUD) signed the first agreement to purchase water from the Town of Cathlamet. An Interlocal Agreement between the Town of Cathlamet and the Wahkiakum PUD was initially signed November 21, 1977, to purchase water from the Town to supply the Puget Island Water System. The water treatment plant (WTP) was upgraded in 1999 and a new Interlocal Agreement was made with Wahkiakum PUD.

Table 1-1 is a brief summary of the development history of the Town of Cathlamet:

TABLE 1-1

Significant Events in the History of the Town of Cathlamet Water System

Date	Event
1940	Construct Columbia Street Reservoir (not in service)
1960s/70s	Construct water distribution system
1967	Construct original Water Treatment Plant
1967	Construct 500,000-gallon Greenwood Reservoir
1995	Prepare Water System Plan
1998	Construct Greenwood Road Booster Pump Station
1998	Construct 530,000-gallon Kent's Bridge Reservoir
1999	Construct new Water Treatment Plant
2000	Update Water System Plan
2008	Update Water System Plan
2015	Update Water System Plan
2016	Raw Water Intake Improvements
2020	Columbia Street Water Main Improvements
2022	Update Water System Plan

Figure 1-2 shows the Town of Cathlamet water system facilities, Town boundaries and water service area. Figure 1-3 shows the retail service area. As required by the Municipal Water Law the Town has the responsibility to provide water to customers within the retail service area. Figure 1-4 shows the system study area and zoning.

Wahkiakum County has not adopted zoning designations for unincorporated areas of the county.

The Town of Cathlamet Water System draws water from the Elochoman River through an intake pipe installed in the river bed. Water flows through the intake pipe to the water treatment plant located on the bank of the Elochoman River. The raw water is treated and pumped into the distribution system and the Greenwood Reservoir. A booster pump station located adjacent to the Greenwood Reservoir pumps water from the Greenwood Reservoir into the Kent's Bridge Reservoir. The Kent's Bridge Reservoir operates at a higher pressure zone and can also serve and provide additional fire flow to the downtown area and Puget Island through two pressure reducing stations.

NATURAL FEATURES OF THE SERVICE AREA

Geography and Climate

The Town sits on the edge of bluff with flatlands near the Columbia River. It is bordered to the south and west by the Columbia River, to the northwest by lowlands and floodplain along the Elochoman River, and to the east by the Willapa Hills. Figure 1-5 shows the area topography for the Town. Elevations range from 615 feet above sea level around the Kent's Bridge Reservoir, 475 feet in the southwest hills, and to 10 feet along the river on the south edge of the retail service area.

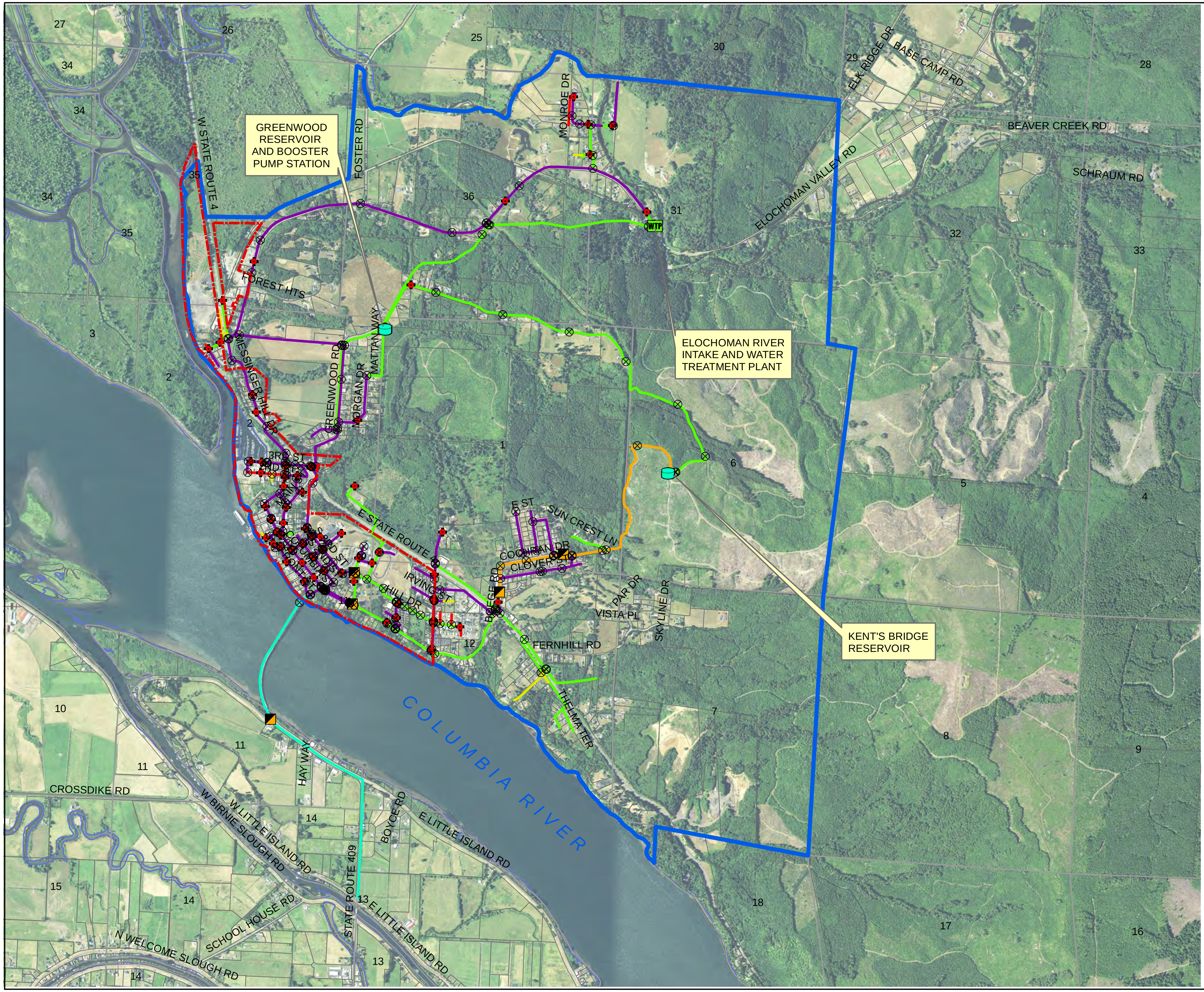
Average temperatures have historically ranged from 30 degrees F in January to 82 degrees F in August; however, it is not uncommon for the Town to experience winter temperature below 10 degrees F and summer temperatures above 100 degrees F.

Soils and Geology

According to the National Resources Conservation Service (NRCS) *Soil Survey for Grays Harbor County Area, Pacific and Wahkiakum Counties*, a survey last updated December 2007, all soil within 200 feet of the Columbia River shoreline is Udipsamments. Other soils in the Town are classified as Cathlamet Silt Loam.

Site Sensitive Areas

Site sensitive areas within the water service area include those classified as seismic hazard areas, flood hazard areas, wetlands, and surface waters. Wetlands and floodplain areas within the water service area are shown in Figures 1-6 and 1-7, respectively, and are described further below.



N

0 1,000 2,000 4,000 Feet

LEGEND:

- TOWN LIMITS
- SERVICE AREA
- RESERVOIR
- VALVE
- PRESSURE REDUCING VALVE
- FIRE HYDRANT

WATERLINES:

- LESS THAN 2"
- 4 INCH
- 6" INCH
- 8" INCH
- 12 INCH
- PUGET ISLAND SERVICE LINE

ORTHOPHOTO SOURCE: 2021 NAIP

TOWN OF CATHLAMET

WATER SYSTEM PLAN
FIGURE 1-2
WATER SYSTEM FACILITIES

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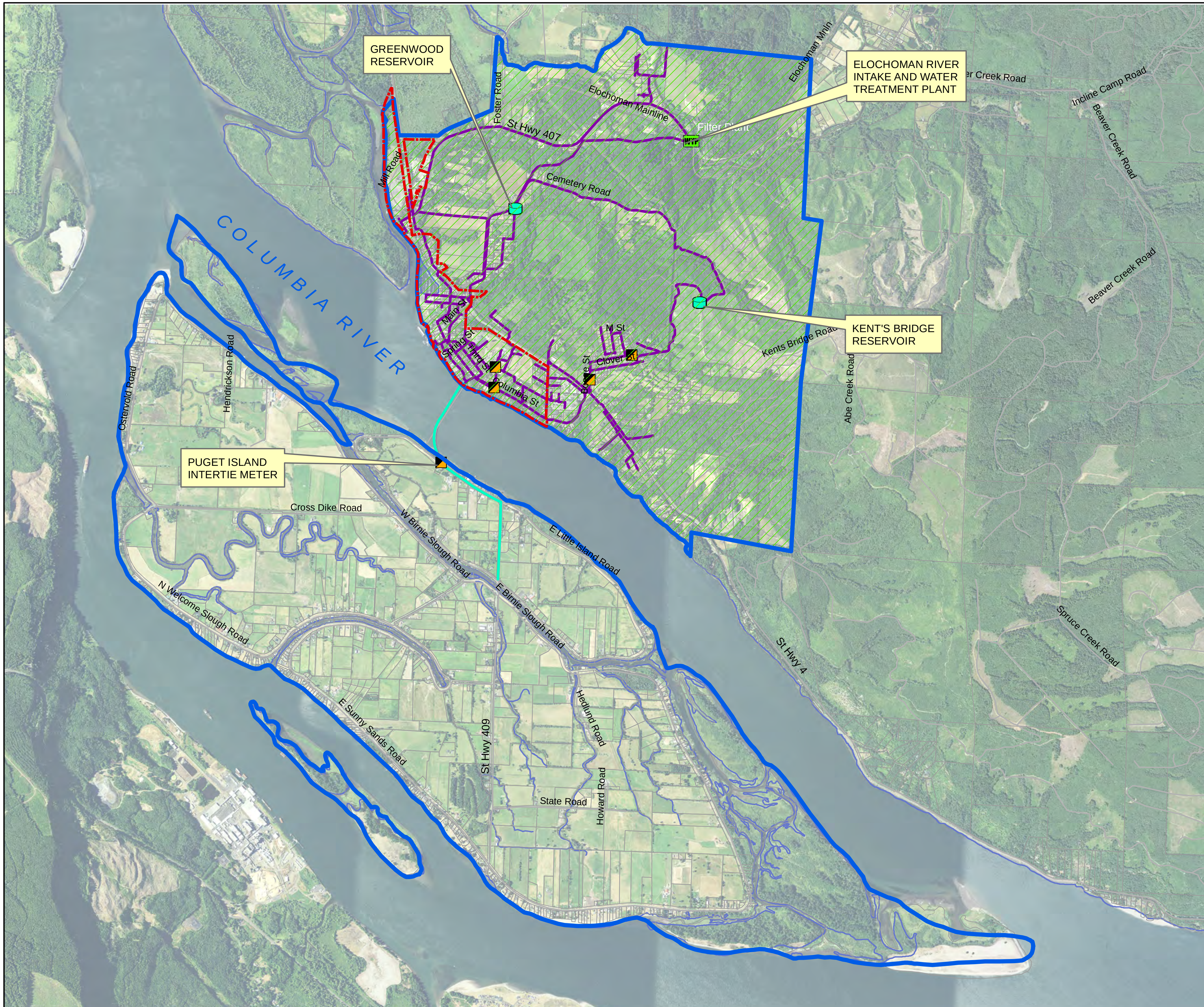

N

0 2,000 4,000 8,000 Feet

LEGEND:

- CATHLAMET TOWN LIMITS
- WATER RIGHTS PLACE OF USE
- RETAIL SERVICE AREA
- Parcels
- Water Pipes
- Reservoirs
- PRV
- Pumps

ORTHOPHOTO SOURCE: 2021 NAIP

TOWN OF CATHLAMET

WATER SYSTEM PLAN
FIGURE 1-3
RETAIL SERVICE AREA MAP

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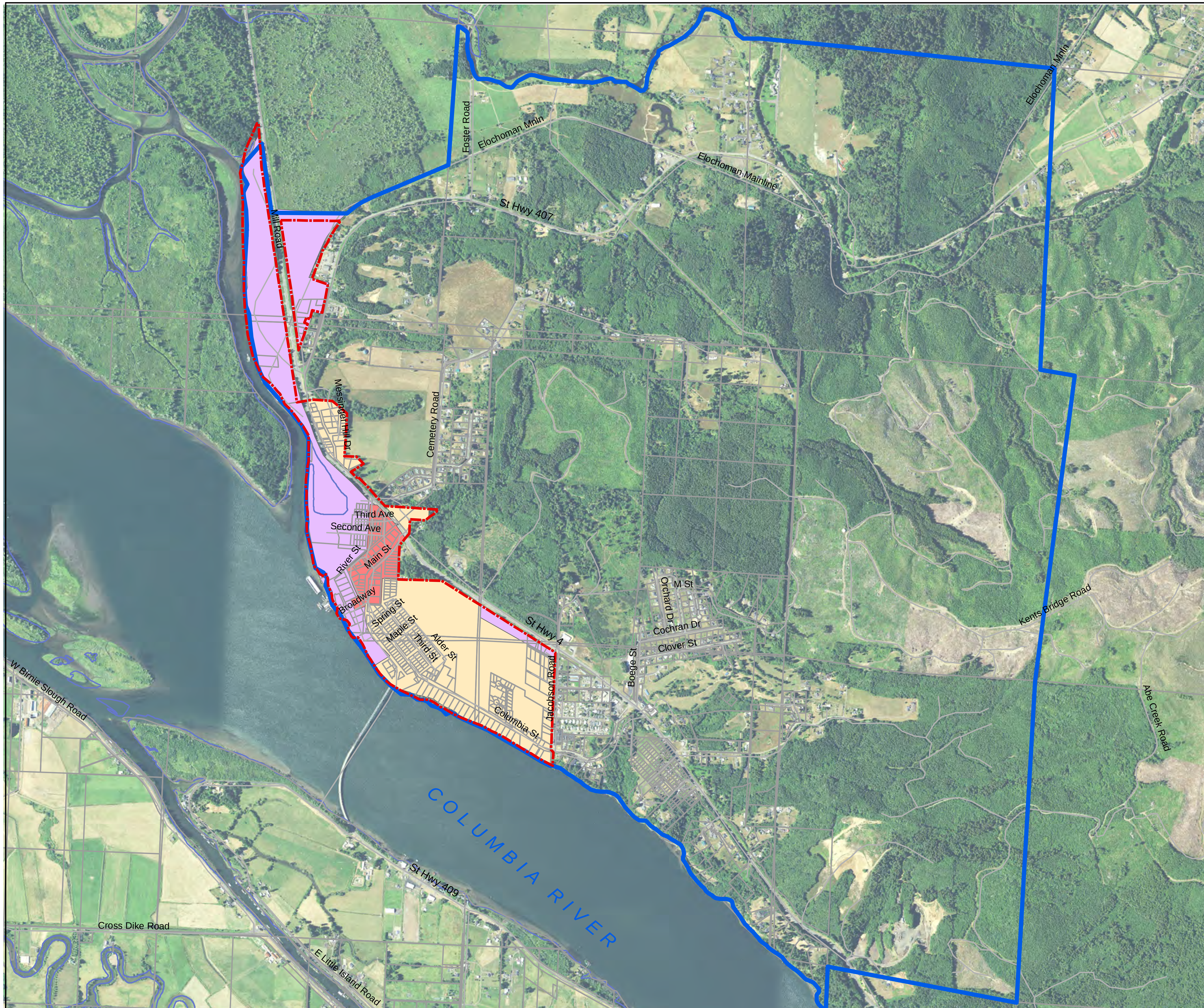
Document Path: L:\Cathlamet\22229.00 Water System Plan Update\GIS\MXDs\Fig 1-3 Retail Service Area.mxd



LEGEND:

TOWN LIMITS

RETAIL SERVICE AREA

ZONE

COMMERCIAL

COMMERCIAL INDUSTRIAL

RESIDENTIAL

ORTHOPHOTO SOURCE: 2021 NAIP
ZONING SOURCE: WAHKIAKUM COUNTY GIS

TOWN OF CATHLAMET

WATER SYSTEM PLAN
FIGURE 1-4
ZONING MAP

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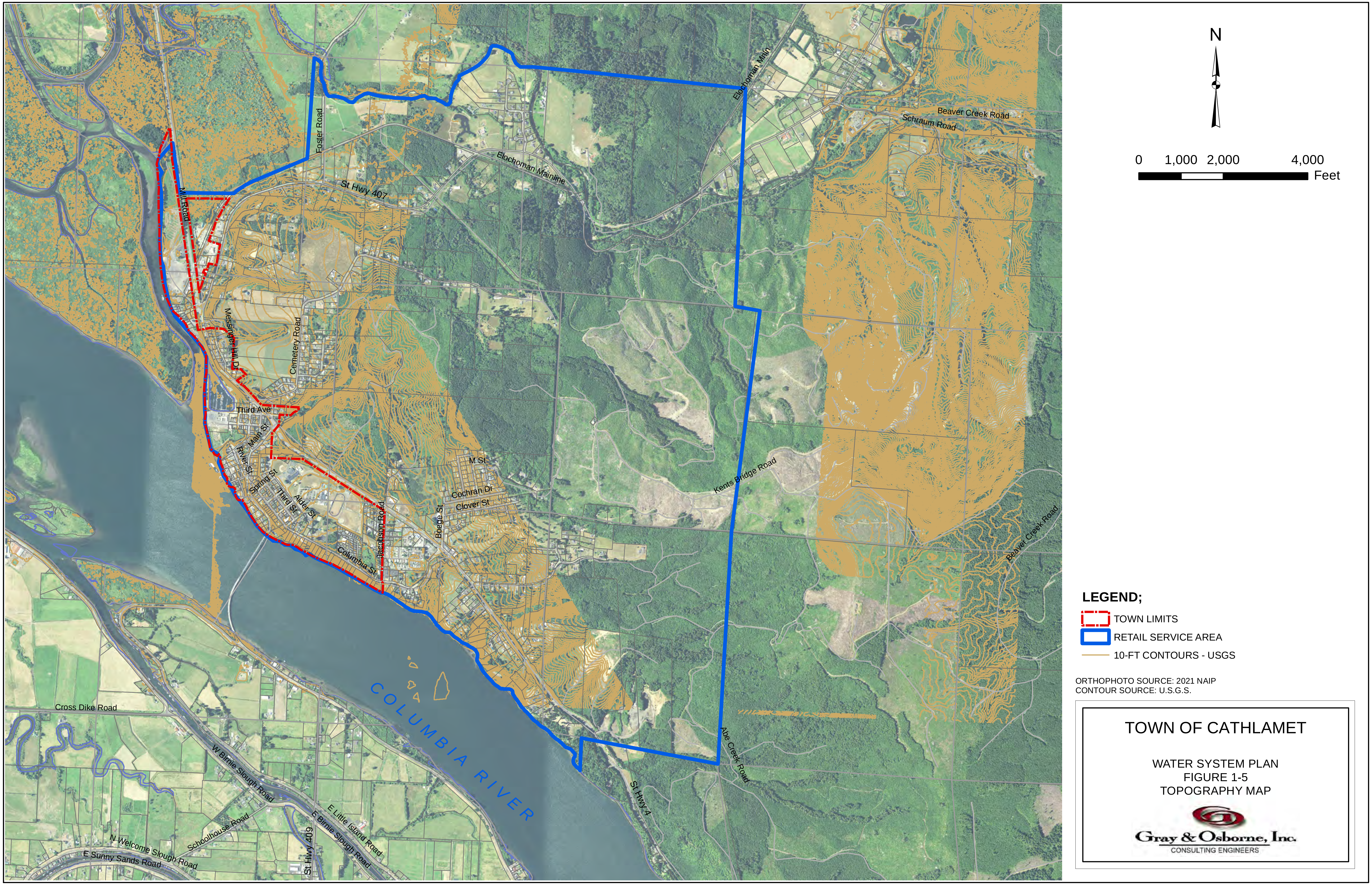

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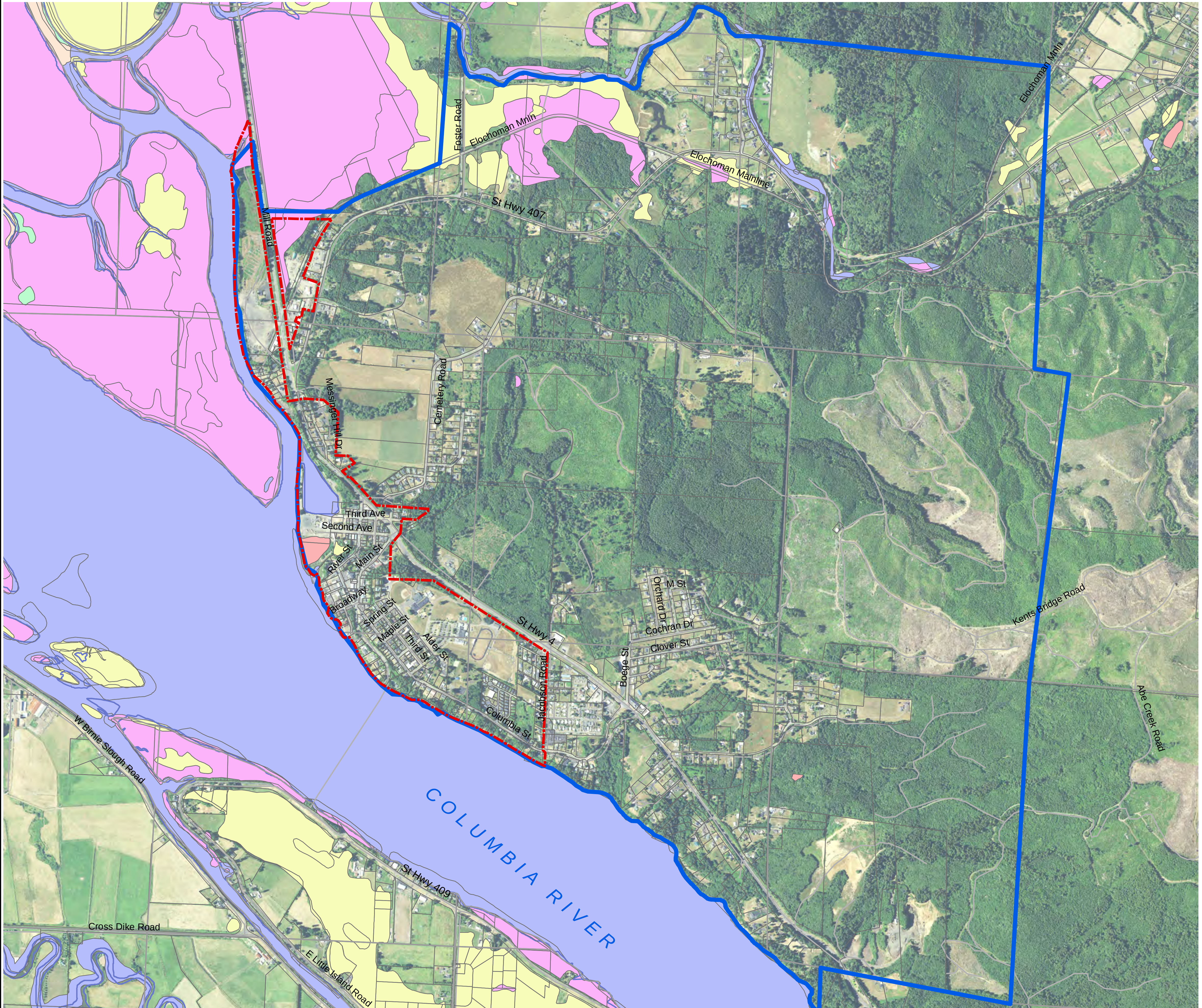

N

0 1,000 2,000 4,000 Feet

LEGEND:

TOWN LIMITS

Service Area

WETLAND AREAS

ESTUARINE & MARINE DEEPWATER

ESTUARINE & MARINE WETLAND

FRESHWATER EMERGENT WETLAND

FRESHWATER FORESTED/SHRUB WETLAND

FRESHWATER POND

LAKE

RIVERINE

ORTHOPHOTO SOURCE: 2021 NAIP
SOURCE: NATIONAL WETLAND INVENTORY

TOWN OF CATHLAMET

WATER SYSTEM PLAN
FIGURE 1-6
WETLANDS MAP

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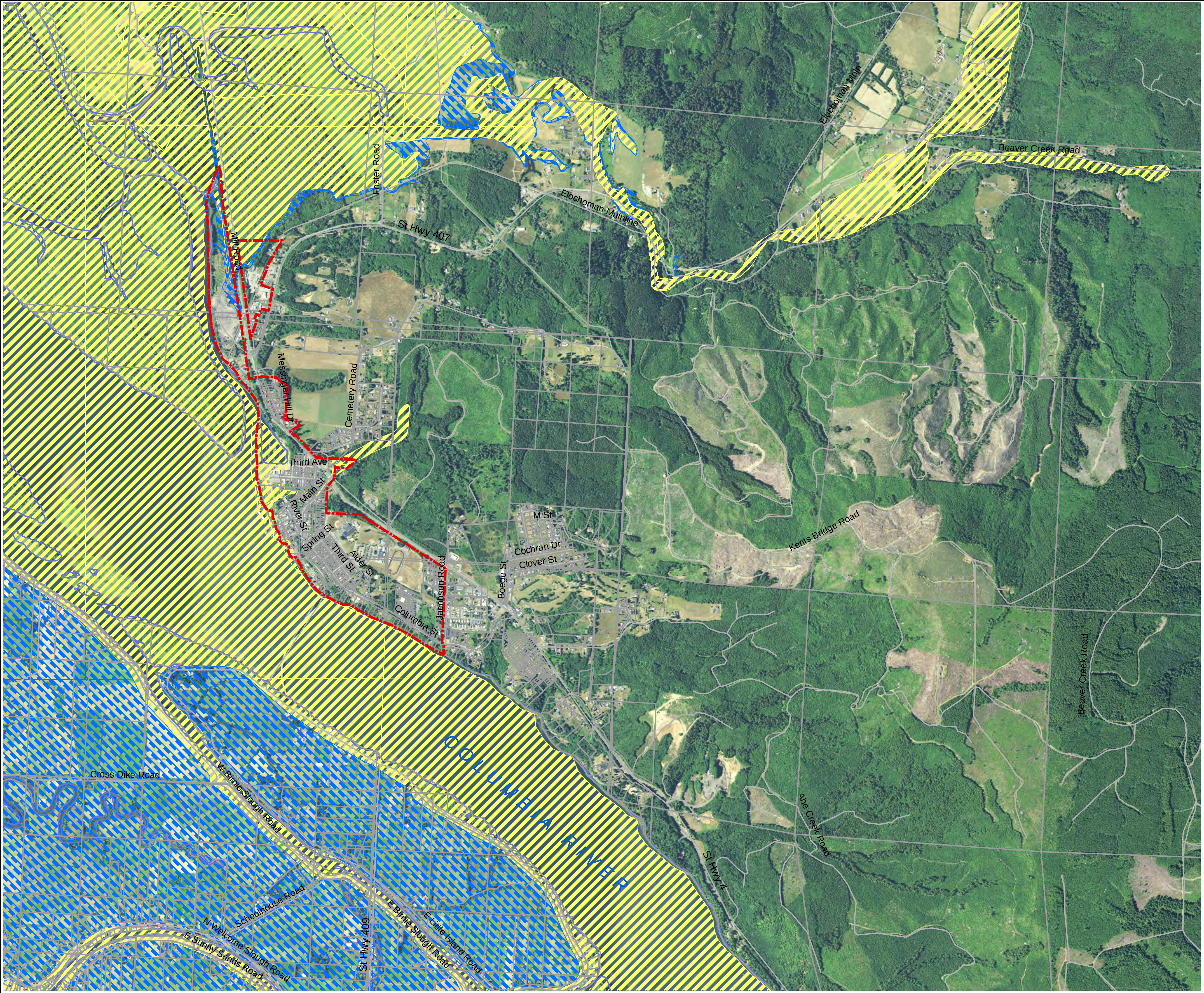

N

0 1,000 2,000 4,000 Feet

LEGEND:

TOWN LIMITS

FEMA FLOOD ZONES

100 YR FLOODING

500 YR FLOODING

ORTHOPHOTO SOURCE: 2021 NAIP
SOURCE: FEMA

TOWN OF CATHLAMET

WATER SYSTEM PLAN
FIGURE 1-7
FLOODPLAINS MAP

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L:\Cathlamet\14221.00 Water System Plan Update\Figures\Fig 1-7 Floodplain Map.mxd

Seismic Hazard Areas

Seismic hazard areas are those with low-density soils that are more likely to experience greater damage due to seismic-induced subsidence, liquefaction, or landslides. Seismic hazard areas are regulated mainly with respect to public safety and potential damage due to an earthquake.

According to the International Building Code, the Town of Cathlamet is located in the 0.4 to 0.8 range on the seismic hazard map. This means that there is a two percent probability of an earthquake exceeding peak ground acceleration between 0.4 and 0.8 times the acceleration of gravity once every 50 years.

Wetlands

EPA defines wetlands as areas that are inundated with water for at least part of the year. The US Fish and Wildlife Service defines wetlands as those areas that have characteristics such as hydrophyte plants, hydric soils, and frequent flooding. Wetlands support valuable and complex ecosystems and consequently development is severely restricted if not prohibited in most wetlands. The National Wetlands Inventory map identifies wetlands in the Town that follow the shoreline of the river; Figure 1-6 illustrates the boundaries and types of wetlands within the Town.

Flood Hazard Areas

Flood hazard areas are areas adjacent to lakes, rivers, and streams that are prone to flooding during peak runoff periods. Flood hazard areas deserve special attention due to the sensitive nature of their ecosystems as well as the potential for damage to structures located within the floodplain.

Typically, construction in flood hazard areas is not allowed or is limited to specific activities. Allowed activities might be mining or gravel extraction, recreational uses, repair to existing structures, utility and road construction, or limited to uses dependent upon water such as docks, wharves, and boating activities.

The 100-year and 500-year floodplains in the vicinity of the Town are shown on Figure 1-7. The floodplains are associated with the Columbia River, Elochoman River, and Birnie Creek.

Surface Waters

Lakes and streams are classified as sensitive areas due to the variety of plants and animals that they support. The Town is located within Water Resource Inventory Data (WRIA) 25. The primary surface water features within or near the community is the surrounding water of the Columbia River, Elochoman River, and Birnie Creek.

Fish and Wildlife Habitat

Fish and wildlife habitat Conservation areas are essential for maintaining specifically listed species in suitable habitats. The WAC 365-196-485 (3) lays out recommendations for meeting requirements of critical areas.

Wildlife observed in the area includes hawk, eagle, heron, deer, and elk.

The Columbia River borders the Town to the south and Birnie Creek passes through the Town. The Lower Columbia River provides habitat for coho salmon, steelhead, Chinook, chum, bull trout sturgeon and eulachon. Birnie Creek provides habitat for steelhead and coho salmon.

Vegetation

The dominant tree species in the community includes fir, cedar, alder, maple, and aspen.

ADJACENT PURVEYORS

The Town of Cathlamet supplies wholesale water to the Puget Island Water System, a Group A water system located on Puget Island owned and operated by Wahkiakum PUD No. 1. The Town also supplies water to the Crista Vista community water system. Crista Vista is a private community that owns and operates a distribution system serving the community. The next closest public water system is located in the unincorporated community of Skamokawa, which is approximately eight miles west of Cathlamet.

INVENTORY OF EXISTING FACILITIES

SOURCE OF SUPPLY

The Town of Cathlamet relies on the Elochoman River for 100 percent of its water supply. The raw water intake is located approximately 2 miles east of SR 4 along SR 407. The raw water intake infiltration trench was installed in 1986 and consists of approximately 90 linear feet of perforated 10-inch high-density polyethylene (HDPE) pipe that extends across the width of the Elochoman River. In 2016, a secondary surface water intake was installed on the Elochoman River adjacent to the infiltration trench. The surface water intake consists of a bullet nose screen and valve that connects to the raw water intake pipe.

WATER RIGHTS

Water rights Certificates, Permits, and Reports of Examination were reviewed to determine the current status of the Town of Cathlamet water rights. The status of water rights is summarized in Table 1-2. The total water rights available for the system are 1.83 cfs (821 gpm) instantaneous withdrawal rate (Q_i) and 633.8 acre-ft/year annual withdrawal rate (Q_a) of which the maximum withdrawal between May first through September 30 is limited to 247.3 acre-ft/year.

TABLE 1-2

Town of Cathlamet Water Rights

Water Right Number	Points of Withdrawal	Priority Date	Certificate Date	Withdrawal Rate
Cert No. 10260	Elochoman River	February 4, 1941	March 22, 1968	0.83 cfs 572.3 acre-feet(1)
Cert No. 3968B	Elochoman River	March 8, 1946	August 2, 1994	0.20 cfs(1)
Cert No. 3718B	Elochoman River	August 1, 1946	August 2, 1994	0.30 cfs(1)
Cert No. 2929(2)	Elochoman River	October 6, 1945	September 1, 2003(3)	0.50 cfs 61.5 acre-feet
782C	Abe Creek	March 27, 1928	March 29, 1934	0.50 cfs(4)
40C	Cougar Creek	June 25, 1922	February 16, 1923	0.60 cfs(4)
Total Permitted Withdrawal Rate from the Elochoman River (Instantaneous)				1.83 cfs (821 gpm)(5)
Maximum Annual Withdrawal from the Elochoman River				633.8 acre-feet
Maximum Withdrawal May 1 through September 30 each year				308.8 acre-feet(6)

(1) Total quantities diverted May 1 through September 30 each year under these certificates shall not exceed 247.3 acre-feet. Total annual quantities diverted under these certificates shall not exceed 572.3 acre-feet per year.

(2) Original certificate number, which was purchased by the Town of Cathlamet from Dale and Margaret Strueby.

(3) Development schedule project completion date given on the Department of Ecology Amended Permit dated December 28, 2001.

(4) Abe Creek and Cougar Creek are not tributary to the Elochoman River and water is not being diverted from either source for use by the Town. Although water rights were issued to Cathlamet allowing withdrawal from Cougar Creek and Abe Creek, it was reported in the Record or Examination (ROE) that Cathlamet has not used either diversion since the Elochoman River withdrawal was permitted.

(5) Includes the four certificates (0.83, 0.20, 0.30, and 0.50 cfs) but does not include Abe and Cougar Creeks.

(6) Includes the original maximum withdrawal rate of 247.3 AF/Y plus the newly acquired water right, which includes an annual withdrawal rate of 61.5 AF/Y.

In 2001, the Town purchased an additional 0.5 cfs of irrigation water rights from the Elochoman River from a local farmer (Certificate #2929), which has been included in the 1.83 cfs instantaneous withdrawal rate. Additionally, the new 0.5 cfs water right included 61.5 acre-ft/year (Certificate #2929) annual withdrawal, which is included in the total 633.8 acre-ft/year. The maximum withdrawal between May first through September 30 of 247.3 acre-ft/year (from Certificate #10260) is the original water withdrawal quantity, however this quantity should be increased by 61.5 acre-ft/year since that water right was originally used for irrigation when it was transferred to the Town. Therefore, the maximum water right available between May first and September 30 is 308.8 acre-ft/year. Currently, the irrigation rights that were purchased are permitted but not certificated by the Washington Department of Ecology. The Town has no additional water rights applications pending. The Town of Cathlamet Water Rights Certificates and Permits are included in Appendix B.

INTERTIES

As shown in Figure 1-2, the Town provides water to Puget Island and Crista Vista water systems through a total of two metered interties

Puget Island Water System

The only major intertie for the Town of Cathlamet is the distribution line from the Town to the Puget Island Water System on Puget Island via Highway 409. The Wahkiakum PUD purchases finished water from the Town through a metered intertie for the Puget Island Water System. The master meter between the Cathlamet Water System and the Puget Island Water System is located on the north side of the SR 409 bridge. It is stated in the Interlocal Agreement between the Town of Cathlamet and the Wahkiakum PUD that the Town is responsible for source capacity, treatment, and storage, and this is reflected in the cost of the water purchased by the Wahkiakum PUD. The Agreement includes performance and impossibility clauses that state the Town shall not be liable for failure to deliver a sufficient supply of water to the Wahkiakum PUD resulting from unforeseeable conditions beyond the Town's control. These include but are not limited to: acts of God, insufficient supply, drought, hostile diversion or obstruction, forcible entry, temporary damage by flood or other unavoidable accidents.

According to the terms of the Interlocal Agreement, the Wahkiakum PUD agrees to purchase 100 percent of the water requirements of its Puget Island Water System from the Town of Cathlamet. The Parties have determined that the rate charged to the Wahkiakum PUD should be directly related to the costs incurred by the Town in producing the water supplied. These include depreciation costs of the Town's Water Treatment Facility, reservoirs, and the primary and alternative transmission lines from the Water Treatment Facility to Puget Island. The Wahkiakum PUD is also responsible for a portion of the operation and maintenance cost of the Treatment Facility, personnel, and equipment. The Wahkiakum PUD is responsible for the operation and maintenance of its own distribution system on Puget Island. A copy of the most recent Interlocal Agreement is located in Appendix C.

Crista Vista Water System

The Town of Cathlamet supplies water to the Crista Vista area that was formerly known as the Crista Vista Water System. The Department of Health inactivated the Crista Vista Water system in 2005. The Town now provides water to a single service meter that supplies water to approximately 15 service connections. It is inside the Town's Retail Service Area, but outside the Town Limits.

TREATMENT AND DISINFECTION FACILITIES

Raw water from the intake is treated by a conventional filtration plant located adjacent to the intake. The original water filtration plant consisted of a raw water sedimentation basin followed by a rapid sand filtration plant. Construction of the Town of Cathlamet Water Treatment Plant was completed in February 1999. The original plant, built in 1967, was rebuilt in 1998-1999 reusing only the original clearwell and raw water intake manhole. The water treatment plant sits on a triangular piece of property approximately 0.75 acres in size located approximately two miles east of SR 4 on Elochoman Valley Road (SR 407). The plant has two filtration trains that each consists of an adsorption clarifier followed by a dual media filter. The raw water sedimentation basin was eliminated during construction of the new filtration plant. The water treatment plant can effectively treat raw water with turbidities up to 150 NTU. At higher turbidities, the filter can become blinded with solids. Based on historical raw turbidity data, it is possible that the existing filter plant could be unable to adequately treat raw water from the Elochoman Intake under some conditions. During these high turbidity events, which occur on average every 2 to 3 years and last 1 to 3 days, the raw water intake pipe and raw water pump have accumulated sediment severely restricting the flow of raw water into the treatment plant. The Town has connected the water treatment plant air blower to a cleanout on the intake line with flexible hose to periodically flush sediment from the intake.

A secondary surface water intake was constructed in 2016 adjacent to the infiltration pipe to allow the plant to draw in raw water from the surface of the Elochoman when the infiltration pipe capacity is restricted by sediment or when water levels get low, reducing the flow of water that can be captured through the infiltration gallery. The secondary surface water intake is equipped with a bullet-nosed screen and isolation valve.

Disinfection is accomplished with a sodium hypochlorite solution injected into the water before the static mixers, as a pretreatment, and after it has passed through the filters before entering the clearwell. Each raw water pump and filter train has its own sodium hypochlorite injection pump and calibration chamber to verify the pumping rate. In addition to disinfection, the Town adds sodium fluoride to the water to improve dental health.

The water treatment plant consists of the following components, which are described in more detail in the section below and summarized in Table 1-3.

- Chemical addition
- Two package water treatment units each consisting of an upflow adsorption clarifier followed by a mixed media gravity filter.
- A clearwell.

- Finished water pumping to Greenwood Reservoir/Distribution System.

- Backwash settling tank with discharge of clarified backwash water to the Elochoman River.

TABLE 1-3

Cathlamet Water Treatment Plant Components

Process	Qty.	Description
Raw Water Intake		
Intake Pumps	2	Floway 7.5 hp 4-Stage 10JKM, rated at 350 gpm each
Influent Turbidimeter	1	Hach Surface Scatter 6
Influent Flow Meter	1	Siemans Sitrans FM Magflo Mag5000/Mag5100W
Chemical Feed System		
Streaming Current Monitor	1	Chemtrac SCM2500, located under filters
Polymer Pumps	2	Jesco MAGDOS 1.6 gph (one for coagulant, one for filter aid)
Chlorine Pumps	2	Stenner 85 MHP5
Fluoride Pumps	2	Stenner 85 MHP40
Static Mixer	1	TAH 3-Stage Process Mixer
Filtration		
Filter Unit	2	USFilter, Trident 210A, rated for 700 gpm
Finished Water		
Finished Water Pumps	2	Floway, 30 hp, 300 gpm (600 gpm total)
Chlorine Pumps	2	Stenner 85 MHP5
Chlorine Analyzer	1	Hach CL17
Finished Turbidimeter	1	Hach Low Range 1720D
Controls		
SCADA	1	GE Proficy
Emergency Power		
Portable Generator	1	Cummins QSB7-G5 NR3, 480/277V Voltage Range

Chemical Feed System

The chemicals used at the plant are:

- Nalco Ultrion 8185 (cationic polymer) as coagulant
- Nalclear 8170 (non-ionic polymer) as filter aid
- Sodium hypochlorite as a disinfectant
- Sodium fluoride for tooth decay prevention

Sodium hypochlorite is first injected into the raw water immediately after the intake meter before the static mixer. The coagulant (Nalco Ultrion 8185) and filter aid (Nalclear 8170) are injected into a static mixer located on the raw water line before the filters.

Sodium hypochlorite and fluoride are injected after the filter units and before the water enters the first clearwell.

Coagulant Injection

The Town uses two Jesco, Model 1102B-0007C-D1CC metering pumps for coagulant injection. The coagulant is pumped into a 1/2-inch carrying stream that is injected into a static mixer prior to entering the filters. One pump is used per filter/raw water pump, therefore, if one filter/raw water pump is operating one pump operates, if both filters/raw water pumps are in use then both chemical feed pumps will be running. A calibration chamber is used to verify the pumping rate and is plumbed into the metering pump assembly.

Sodium Hypochlorite Disinfection

Sodium hypochlorite is first injected into the water before it passes through the static filter. This helps to remove iron and manganese. The Town injects hypochlorite solution after the water has passed through the static filter, but before it enters the clearwell. The Town purchases 12.5 percent sodium hypochlorite under a mini-bulk program. A 300-gallon double contained bulk tank is provided to receive the bulk deliveries. The minimum delivery is 200 gallons. A pneumatic pump is used to transfer the product to the 40-gallon day tank mounted on a platform scale where the usage is measured by weight. Average use is typically between about three and 7 gpd. Two Stenner metering pumps are used to inject the sodium hypochlorite. One pump is used per filter/raw water pump and a calibration chamber is used to verify the feed pump pumping rate.

Since the Town's Elochoman River water source is surface water, the Town must meet the filtration and disinfection requirements of the Surface Water Treatment Rule. These requirements include 3 log removal/inactivation of Giardia, 4 log removal/inactivation of viruses, and 2 log removal/inactivation of Cryptosporidium. The Town's filtration plant is provided with credit for 2 log removal of Giardia, 2 log removal of virus, and 2 log removal of Cryptosporidium. The Town's disinfection system must provide at least 1 log inactivation of Giardia and 2 log inactivation of virus. Since Giardia is more difficult to inactivate with chlorine disinfection than viruses, the 1 log Giardia requirement governs. The Town must confirm that the disinfection provided by the chlorine dose and contact time meets the required CT value each day.

The Town computes the CT daily using a spreadsheet for this purpose that is included in w D. The spreadsheet accounts for flow rate, temperature, pH, and chlorine residual in determining whether the CT requirement is met.

The operator runs finished water tests to determine the temperature, and pH. The chlorine residual is continually tracked and the minimum value for each reporting day is taken off the HMI. The required CT value is based on the CT Lookup table from the DOH chart (last tab on the spreadsheet) which reflects the log removal. To meet the CT requirement, the Town must meet or exceed the CT required (an Inactivation ratio equal to or higher than 1.0) by having an adequate chlorine residual at the current water temperature and pH to inactivate any giardia and viruses present in the water. The lower the temp and the higher the pH, the more chlorine residual is needed.

Fluoridation

Source water is fluoridated to improve dental health. The Town uses 97 percent sodium fluoride, which is injected using an up-flow fluoride saturator to raise the natural fluoride ion level in the water from a background level of 0 mg/L to a treated level of 0.8 mg/L. Daily samples of the finished water are analyzed for Fluoride levels. The injector pumps are manually adjusted to maintain proper concentration in the finished water. Fluoride level in the saturator is checked daily.

Filter Aid

The non-ionic polymer, Nalclear 8170, can be pumped into a 1/2-inch carrying stream, which is injected into a static mixer prior to entering the filters. The two chemical feed pumps are Jesco, Model 1102A-0012C-2CC. As with the coagulant and sodium hypochlorite, there is one chemical feed pump per filter.

Static Mixer

There is one static mixer in the influent line after the raw water pumps and before the line splits to feed the individual filters. The hypochlorite, coagulant, and polymer are injected into the water through separate 1/2-inch carrying streams, which enter the static mixer at the injection ports. The static mixer is a TAH 3-Stage Process Mixer.

Filtration System

Water filtration occurs through two package filter units manufactured by USFilter, Trident Model 210A. Together the filters are rated at 700 gpm (1 mgd). The filters include an upflow adsorption clarifier followed by a downflow mixed media gravity filter. The clarifier surface area for each clarifier is 35 square feet and the filter area is 70 square feet per filter.

<u>Adsorption Clarification</u>

The clarifier is filled with granular adsorption media with a specific gravity of less than 1.0, which is buoyant. Backwash of the clarifier is completed with a combination of an air scour system and raw water at a rate of 300 gpm for four minutes, for a total of 1,200 gallons per backwash clarifier. A clarifier backwash cycle is initiated by maximum times between backwashes, maximum head loss across the clarifier or manually by the plant operator.

Mixed Media Filtration

The mixed media filter consists of 18 inches of anthracite coal on top of nine inches of silica sand and three inches of high-density garnet sand. This media rests on a Triton PVC filter underdrain system. The backwash system consists of control valves, backwash pump, air scour system and waste discharge piping and controls. Filter backwash is initiated by turbidity breakthrough, maximum times between backwashes, maximum headloss across the filter or manually by the operator. Typically, time is the predominant cause for backwash initiation, except during times of high turbidity where headloss often triggers the backwash cycle to begin. The filter backwash sequence begins with a low volume wash with air scour during which the water flow rate is only 400 gpm. When the water level reaches the bottom of the waste trough, the air scrub stops and the water flow increases to 1,000 gpm. The total water used in a backwash is 7,300 gallons per filter. Backwash water is pumped directly from the 55,000-gallon clearwell at 1,000 gpm.

The mixed media has an expected life of greater than 20 years. The top media layer, anthracite will slowly degrade over time and will require periodic replacement with additional anthracite. It is recommended that the Town evaluate the anthracite level annually and add anthracite as needed.

Filter Backwash Handling

Filter backwash water flows into a 10-foot-diameter manhole, where two submersible pumps transfer the water into a 100,000-gallon above ground concrete backwash settling tank. The backwash settling tank is equipped with a floating decanter which discharges clarified backwash water to the Elochoman River. The backwash settling tank is also equipped with a robotic tank sediment remover. The unit is a Scavenger Model PLR by Aqua Products, Inc. The unit is equipped with an onboard solids handling submersible pump and dual drive motors that can be set for automatic or remote control operation. The Scavenger sediment remover is connected by a flexible hose to a penetration in the wall of the backwash settling tank where the solids can be periodically removed and properly disposed. According to the Town, the Scavenger has never been used.

The filters can only backwash one at a time. If both filters are online and a backwash is initiated, one filter continues to produce water while waiting for the first filter to complete its backwash. If only the lead filter is online when a backwash is initiated, the lag filter comes online and becomes the lead filter. The backwashing filter returns to operation if the demand requires or it remains off as the lag filter.

CLEARWELL

The treatment plant has a below grade concrete clearwell. The clearwell is approximately 55,000 gallons and includes baffles to enhance chlorine contact time. The existing clearwell is adequately sized to supply backwash water and provide chlorine contact storage. The total volume needed to backwash the filters consecutively is approximately 14,800 gallons. The clearwell, has more than adequate volume to meet this requirement. The clearwell was also designed to meet current CT requirements.

FINISHED WATER PUMPING

The finished water pump wet well was the original water treatment plant clearwell. It has a capacity of approximately 12,400 gallons and does not include baffles. Finished water is pumped from this wet well using two vertical turbine pumps, which discharge treated water into the distribution system. The pumps, manufactured by Floway, are 30 hp and are capable of 300 gpm each for a total of 600 gpm. Typical operation consists of the lead pump turning on at 4.5 feet and off at 3.5 feet. If the filter rate is greater than the lead pump can handle, the lag pump will turn on at 5.0 feet. Both pumps will turn off at 3.5 feet. The wet well provides the finish water pumps with operational flexibility.

CONTROLS

The water treatment plant is designed to be controlled based on the water level in the Greenwood Reservoir. A pressure transducer mounted on the side of the Greenwood Reservoir measures the water level in the tank. Based upon preset levels, when the reservoir calls for water the raw water pumps and filter units begin producing water. The high head finish water pumps operate based upon a level transducer in the 12,400-gallon pump well. When the pump well reaches an upper set point the high head pumps begin pumping water to the Greenwood Reservoir.

The high head pumps continue to pump until the clearwell reaches a lower set point. Flow is adjustable through the plant. The operators vary the flow rate through the plant based upon the time of year and the water demand associated with it. Flow control through the filters is maintained by a system of an orifice plate, control valve and differential pressure transmitter on the influent side of the filter units. An electronic level transmitter is located in each filter compartment. The water level in the filter chamber is slightly lower than in the clarifier. The level controller adjusts the filter effluent valve to maintain the level in the filter chamber.

Power to the chemical feed system is activated when the raw water pumps in the water treatment plant are operating. The coagulant pumps are automatically adjusted based on a 4-20 mA signal from the Streaming Current Monitor. The filter aid polymer feed pumps must be manually adjusted by the operators based upon filter performance and jar testing. The sodium hypochlorite pumps are also manually adjusted to meet CT requirements and maintain an adequate chlorine residual in the distribution system. The Fluoride pumps are also manually adjusted to maintain 1.0 mg/l.

The Water Treatment Plant does have a SCADA system, although according to the Town, it needs to be upgraded to enable more functionality. The Filter Control Panel allows the operator to change parameters and set points in the PLC. An autodialer calls out on alarm conditions. The outdated SCADA system requires the operator to spend significant amounts of time at the WTP to diagnose and troubleshoot problems during changing conditions and storms. Also, the SCADA system has had communication issues with the reservoirs. During communication black out events, without a shut off signal from the reservoir, the Water Treatment Plant continues producing water, in some case overflowing the tank until communication is restored or the finished water pumps are manually shut off.

BOOSTER STATION FACILITIES

The Town of Cathlamet has one booster pump station, which is located at the Greenwood Reservoir. The pump station works in conjunction with both the Greenwood Reservoir and the Kent’s Bridge Reservoir. The Greenwood pump station pumps water from the Greenwood Reservoir to the Kent’s Bridge Reservoir when the water level in the Kent’s Bridge Reservoir drops below 22 feet. If the water level in the 32-foot-tall Greenwood Reservoir is below 25 feet and the higher Kent’s Bridge Reservoir calls for water, the pumps in the pump station will not turn on. The pump station consists of a 14' x 14' concrete masonry block building with a composition roof. The pump station is equipped with three 40-hp Cornell pumps rated at 200 gpm each with two pumps running. One pump is always designated a standby pump. Therefore, the pump station has a capacity of 400 gpm. Under normal operation, when the Kent’s Bridge Reservoir calls for water, one pump delivers approximately 200 gpm to the reservoir. If the water level continues to drop an additional 6 inches, a second pump is turned on for a total of 400 gpm. The pump controls alternate which two pumps operate at any given time to keep pump run times about the same. The station is also equipped with pump control valves and a pressure relief valve due to the high static and dynamic pressures at the pump station. The booster pump station was completed in 1998 and is in acceptable working condition, however public works staff believe the pumps are nearing the end of their useful life and should be replaced soon.

BACKUP POWER

The Town is currently working on a project to add a permanent emergency generator for the Water Treatment Plant. This project is expected to be constructed in 2023, which will give the Town the ability to continue operations at the Treatment Plant in a power outage situation without having to manually hook up a rented generator. The Greenwood booster pump station is equipped with a manual transfer switch to allow use with a portable power generator but does not have an emergency generator on site.

STORAGE

There are two storage facilities that serve the Town, the Greenwood Reservoir and the Kent’s Bridge Reservoir, which provide a total storage capacity of 1.03 million gallons.

The Greenwood Reservoir has a nominal capacity of 500,000 gallons. It is a welded steel tank located on Greenwood Road north of the downtown area. The reservoir was constructed in 1967 and has a 52-foot diameter and is 32-feet tall. The overflow elevation is 278 feet and has a base elevation of 246 feet. A hydraulic grade line is a way of quantifying the pressure in a pipe or geographic zone in terms of elevation. The Greenwood Reservoir sets the hydraulic grade line of Zone 1, which includes the Greenwood Road area below the reservoir, downtown Cathlamet, and Puget Island. The reservoir is connected to the distribution system by an 8-inch cast iron pipe. The tank has separate fill and draw lines to promote tank turn over. The reservoir is equipped with a screened vent, water level indicator, drain line, overflow line, top access hatch and ladder. A pressure transducer located on the side of the Greenwood Reservoir, monitors the water level in the tank. When the water level in the reservoir drops to 29.5 feet, the raw water pumps at the water treatment plant are called and begin operation of the water filters. The raw water pumps are turned off when the water level in the reservoir reaches 31.5 feet. This reservoir was last repainted in 2007 and is scheduled to be repainted again in the near future.

The Kent's Bridge Reservoir has a nominal capacity of 530,000 gallons. It is a glass lined, bolted steel reservoir, constructed in 1998. The existing site has room for a future 530,000-gallon reservoir. The existing reservoir is 62-foot diameter, is 24-feet high, has an overflow elevation of 639 feet, and base elevation of 615 feet. The Kent's Bridge Reservoir sets the hydraulic grade line for Zone 4 and provides source water to three additional pressure zones through cascading PRV stations. Two additional PRV stations allow for the Kent's Bridge Reservoir to provide fire flow to Zone 1. The reservoir is connected to the system with a 12-inch ductile iron water main. The reservoir is equipped with a screened vent, water level indicator, access manhole in the side, drain line, overflow line, top access hatch and ladder. When the water level in the tank drops to 22 feet, the telemetry system prompts the Greenwood booster pump station to start and fill the reservoir. The pumps are set to operate in a lag lead mode with the level differential of 1 foot.

TELEMETRY

The telemetry system for the water system is designed to operate the treatment plant and associated pumps and the Greenwood Booster Pump Station in response to water level monitored at the storage reservoirs. When the Greenwood Reservoir reaches a preset level the raw water pumps at the treatment plant are activated. Similarly, when the Kent's Bridge Reservoir reaches a preset level the pumps in the Greenwood pump station begin pumping water to refill the reservoir. Reservoir levels are transferred via phone lines and digitally displayed in the treatment plant lab and are recorded once per day by hand. The two pen chart recorders also can record when the high head pumps are running and when the Greenwood pumps are running; however, this feature is no longer used. The PLC at the water treatment plant monitors operation of the filters, pumps, reservoirs, chemical feed system, water quality, etc. If a problem occurs, the autodialer, located at the treatment plant, will begin calling programmed numbers until the alarm condition is acknowledged and corrected. According to discussions with the operators, there are frequent phone line outages which cause communications blackouts between the WTP and the Greenwood Reservoir resulting overflows at the reservoir. Additional discussions of this issue are provided in Chapter 3.

The system is difficult for operators to use because it requires operators to respond to the plant whenever there is an alarm. This results in longer response times if the problem is not actually at the treatment plant.

TRANSMISSION AND DISTRIBUTION

The Town of Cathlamet Water System has approximately 20 miles of water main ranging in diameters from 4 to 12 inches. Approximately 40 percent of the pipe is asbestos cement (A/C) and over 38 percent is poly vinyl chloride (PVC) pipe. The summary of pipe types and diameters is included in Table 1-4. A complete map of the water distribution system is included in Figure 1-2.

TABLE 1-4

Town of Cathlamet Water System Pipe Length and Size

Pipe Size	Length (feet)	Percent of Total
0.75-inch	58	0.1%
1.5-inch	122	0.1%
2-inch	2,254	2.0%
3-inch	84	0.1%
4-inch	2,603	2.3%
6-inch	54,098	49.0%
8-inch	44,317	40.1%
12-inch	6,949	6.3%
Total	**110,485**	**100%**

Pressure Zones

The Town of Cathlamet water distribution system consists of five pressure zones, as shown in Figure 1-8. Following is a description of each pressure zone.

<u>Zone 1</u>

Zone 1 consists of the downtown area, Greenwood Road below Greenwood Reservoir, SR 4 west of Greenwood Road and SR 407 out to the water treatment plant. The zone is fed mainly from the Greenwood Reservoir, which has an overflow elevation of 278 feet above mean sea level; however, two pressure reducing stations are designed to feed the downtown area from the zones cascading down from the Kent's Bridge Reservoir during high demand periods or a fire flow event. The area consists mainly of 6-inch AC water main, which for the most part is well looped. Elevations of customers served within Zone 1 range from 10 feet above mean sea level to approximately 200 feet above mean sea level. Static pressures in the downtown area range from 34 to 116 psi with the Greenwood Reservoir full.

Zone 2

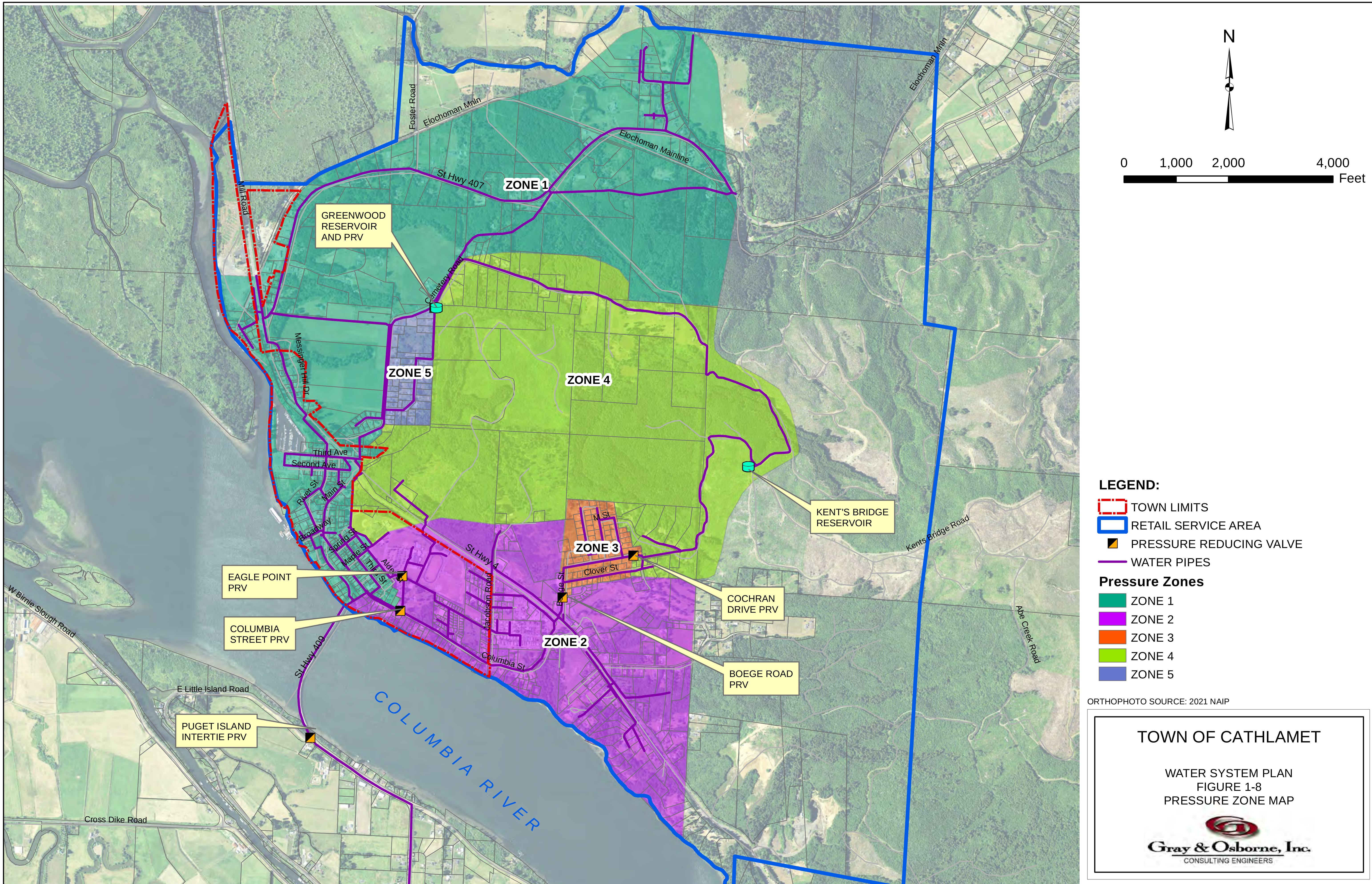
Zone 2 includes Columbia Street, Jacobsen Road, SR 4 from Jacobsen Road east and below the pressure reducing station on Boege Road. Water is supplied to the closed zone from the Kent's Bridge Reservoir through a series of two pressure reducing stations. The service area in the zone ranges in elevation from 180 feet above mean sea level to an elevation of 235 feet. Customers in this zone have pressures ranging from 60 to 85 psi. The area consists primarily of 6-inch AC and 8-inch PVC water mains.

Zone 3

Zone 3 is a closed zone which serves customers along Cochran Drive, Hillcrest Drive, Delores Drive, Orchard Drive, Boege Road and the lower half of Clover Street. Water is supplied from the Kent's Bridge Reservoir through a pressure reducing station located at the top of Cochran Drive and leaves the closed zone at the Boege Road pressure reducing station. The zone is small due to the large elevation change, from 430 feet above mean sea level to 230 feet above mean sea level, in a short distance. The feed line through the zone is a 12-inch PVC water main. The remainder of the lines are 6-inch AC. The pressure in the zone can be adjusted at the pressure reducing station, however, normally pressures range from 35 psi to 120 psi. Those services that have pressures exceeding 90 psi have been fitted with individual pressure reducers.

Zone 4

Zone 4 is a large, very spread out zone, however, it serves relatively few customers. The area served ranges from the Greenwood Road above the Greenwood Reservoir/Booster Pump Station to the Kent's Bridge Reservoir down to the upper end of Cochran Drive, Clover Street and the private Crista Vista system. An 8-inch PVC transmission main follows Greenwood Road and Cathlamet Timber logging roads to the Kent's Bridge Reservoir. The Kent's Bridge Reservoir has an overflow elevation of 639 feet above mean sea level. A 12-inch PVC water main provides water from the Kent's Bridge Reservoir along gravel logging roads to the Cochran Drive area. Elevations within the zone range from 245 to 610 feet above mean sea level. This results in pressures ranging from 170 psi at the outlet of the Greenwood Booster Pump Station to 80 psi at the upper end of Cochran Drive. The high pressures on the 8-inch PVC line between the pump station and the Kent's Bridge Reservoir cannot be reduced because the line is a transmission line to the reservoir. All connections on Greenwood Road above the Greenwood Reservoir have individual pressure reducers. All other connections within the zone have pressures less than 90 psi. All of this zone with the exception of 200 to 300 feet in the Cochran Drive/Clover Street area is served by newer PVC water main.



L:\Cathlamet\22229.00 Water System Plan Update\GIS\MXDs\Fig 1-8 Pressure Zones.mxd

Zone 5

This small pressure zone serves Morgan Drive through a pressure reducing station located adjacent to the Greenwood Reservoir/Booster Pump Station site. Water is supplied from the Kent's Bridge Reservoir. Distribution main consists of newer 8-inch PVC and 6-inch AC water main. Elevations range from 190 to 240 feet above mean sea level. Pressures can be adjusted at the pressure reducing station but normally range from 50 to 70 psi.

Puget Island

The Wahkiakum PUD Puget Island Water System is served through a pressure reducing station. Wahkiakum PUD is responsible for operation and maintenance of the Puget Island distribution system. An 8-inch ductile iron water main is attached to the bridge that connects the Town of Cathlamet to Puget Island. The remainder of the distribution system ranges from 4-inch to 6-inch PVC and AC waterlines. The agricultural and rural residential land use characteristics on the island do not require fire flow. The Wahkiakum County Fire District No. 1 has flow tested the hydrants on the island and understands the limited flow capabilities of the system. Typical flows from the existing hydrants range from 100 to 400 gpm. The elevation of Puget Island ranges from 10 to 15 feet above mean sea level. The service pressure on Puget Island is normally set at 55 to 60 psi by the PRV. Wahkiakum PUD has an ongoing maintenance/replacement program to replace older undersized portions of the system.

SERVICE METERS

All water service customers are metered at the point of delivery and the Town has a master meter at the water treatment plant. Individual service meters have historically been read manually. Currently, the Town is in the process of switching to radio read meters and about 65 percent are now being read by radio.

RELATED PLANNING DOCUMENTS

The following documents were consulted in the preparation of this Plan:

Town of Cathlamet Comprehensive Plan

The *Town of Cathlamet Comprehensive Plan* (March 2002) serves as a framework for public decision-making. It specifies policy guidelines for growth and offers a tool to evaluate future projects. The Plan is based upon planning data, which detailed to each chapter, or element. Recommendations take on several forms:

1. Goals – the principles around which each chapter is organized.

2. Objectives – defining action steps for implementation.

3. Policies – to provide a framework for making decisions.

Grays-Elochoman and Cowlitz Watershed Management Plan (WRIA 25/26)

The *Grays-Elochoman and Cowlitz Watershed Management Plan* (December 2004) was developed to support the management of watershed resources for WRIA 25/26. This includes evaluating water quality and quantity, habitat, and stream flows ability to meet the water needs of its community, local economies, and fish and wildlife.

Wahkiakum County Comprehensive Plan Draft

The *Wahkiakum County Comprehensive Plan Draft* (June 2006) was developed as a framework for achieving a balance between land development, maintenance of the natural resource base, and preservation of a lifestyle enjoyed by the county's residents. The Plan is intended to establish the process for making land use decisions based on the stated goals, objectives and policies, however, it was never formally adopted. The Comprehensive Plan was developed to achieve the following broad objectives:

1. To assure that public services and facilities can be provided as needed and in a manner that does not place an excessive burden on the general taxpayers or residents of the area.

2. To assure that future development, whenever possible, is compatible with existing uses. This is generally accomplished by requesting that future development mitigate any activity, which will cause degradation, or a sudden profound change in existing land uses or degrades the health, safety or welfare of current residents of the area.

Puget Island Water System Comprehensive Plan

The *Wahkiakum County Public Utility District No. 1 (PUD) Puget Island Water System Comprehensive Plan* (June 2015) was developed in conjunction with the Town of Cathlamet's previous plan. Puget Island is a wholesale customer to the Town of Cathlamet water system. The Plan evaluates the Puget Island water system's ability to serve its customers through a 20-year planning period.

Shoreline Master Program

The *Shoreline Master Program* (Adopted 2019) for the shorelines in Wahkiakum County and the Town of Cathlamet serves as a guide to how the shoreline will be used and developed.

GMA RELATED PLANS, POLICIES, AND DEVELOPMENT REGULATIONS

Wahkiakum County does not meet the mandatory population requirements to plan under the Growth Management Act (GMA). However, GMA does require the following of counties and cities in Washington not planning under the GMA:

- Resource lands (forest, agricultural, and mineral) and critical areas (wetlands, geologically hazardous areas, fish and wildlife habitat conservation areas, aquifer recharge areas, and frequently flooded areas) must be classified and designated.

- Designated critical areas must be given protection.

- All cities and counties with comprehensive plans must make their development regulations (zoning, subdivision, and other controls) consistent with their comprehensive plans.

The GMA requires the following of all counties and cities in Washington:

- Short plats and subdivisions may be approved only if written findings are made that adequate services are available, or that appropriate provisions are made for the public health, safety, and welfare.

- Any building permit application must supply evidence of adequate water supply for the intended use. The state (the Departments of Ecology and Health) and local governments not planning under the GMA may mutually agree to exempt some areas.

Wahkiakum County has adopted a Critical Areas Ordinance which limits development in areas outside the Town limits, but within the Town water service area.

WATER SERVICE AREA CHARACTERISTICS

EXISTING AND RETAIL SERVICE AREA

The Cathlamet Water System existing and retail service area is the Town of Cathlamet and those areas served outside the Town limits shown in Figure 1-3. The Town wholesales water to the Wahkiakum PUD to serve Puget Island. The Town adopted their Comprehensive Plan in 2004, which identifies the urban growth boundary.

The areas outside the Town limits consist primarily of residential and commercial properties along Elochoman Valley Road, SR 4 and residential in the areas of Greenwood Road, Jacobsen Road, the Columbia River Vista and Rosedale Heights area.

Puget Island is considerably larger in area than the area served by the Town of Cathlamet but is not densely populated.

ZONING AND LAND USE

Land use within the Town is regulated by Ordinance No. 369 and has three land use designations including: residential (R), commercial (C), and commercial/industrial (CI). Land outside the Town limits are under the jurisdiction of Wahkiakum County. Zoning and land use within the Town Limits is illustrated in Figure 1-4. Wahkiakum County does not have any official zoning.

SERVICE AREA AGREEMENTS

There are no service area agreements between the Town and Cathlamet and the PUD regarding the Puget Island, but an interlocal agreement exists. This agreement is located in Appendix C.

POLICIES

The Town has ordinances for its water utility in Chapters 13 of the Town's Municipal Code. Chapter 13.10 establishes utility connections and fees, Chapter 13.15 outlines rates and billing procedures, Chapter 13.30 covers fluoridation of the water supply, Chapter 13.40 includes conservation measures, 13.50 establishes the cross connection control program, and Chapter 13.60 establishes latecomer fees.

Water system policies for the Town of Cathlamet are in ordinance form and are thereby reviewed and approved by the Town Council as they are adopted. Ordinances governing the Town's Water System have steadily increased over time. Those ordinances provide the background for the following water system policies.

WHOLESALING/WHEELING WATER

The Town of Cathlamet currently wholesales water to Wahkiakum PUD for resale. Every year the cost per 100 cubic feet of water is calculated based upon a formula in the Interlocal Agreement between the Town and the Wahkiakum PUD. A copy of the most recent Agreement can be found in Appendix C. The agreement addresses how the water rate is calculated as well as the responsibilities of both parties and how disputes will be handled.

The Town does not foresee any future wheeling of water to adjacent purveyors.

ANNEXATIONS

The Town does not require water customers outside the Town limits to sign an annexation no protest waiver.

DIRECT CONNECTION AND SATELLITE/REMOTE SYSTEMS

Any new customers within the Town limits are required to connect directly to the water system. No new water systems or private wells will be allowed within the Town limits unless approved by the Council. That approval would need to be based on extreme capital costs to extend the water system to allow a direct connection. The approval would include a clause requiring connection to the water system when it is within 300 feet, payment of all fees for the connection and proper abandonment of the private well once connected to the Town's water system. This type of scenario is highly unlikely since there are no large isolated areas within the Town limits where the existing water distribution system is not relatively close. The Town would like to extend this policy to the entire service area, which would require approval by the County.

DESIGN PERFORMANCE STANDARDS

The Town of Cathlamet relies on the DOH Water System Design Manual for design of pump station, intake facilities, storage facilities and the treatment plant. Distribution improvements are to be designed in accordance with the Water System Standards of the Town of Cathlamet, which are included in Appendix D.

LATECOMER AGREEMENTS

The Town will administer latecomer agreements for developers of water main extensions through Ordinance. Developers are required to enter into a contract with the Town and identify an area of benefit for the latecomer agreement. The Town charges a minor fee for administering the latecomer agreement, which is added to the latecomer fee paid by persons connecting to the affected waterline.

OVERSIZING

New water mains shall be a minimum of 8 inches in diameter, except that 4-inch pipe may be used where no future extension is possible, where the length does not exceed 350 feet and no more than eight single-family customers are to be served by the line. The developer/property owner requiring an extension will fund the design and construction of these extensions. The Town will not pay for any oversizing of water mains. In areas surrounding the Town with a reasonable potential for annexation it is prudent to design the water system to support the requirements of in-town fire flow. The water main sizing standards, should be revisited when considering the water main extension into areas such as the Elochoman Valley, east toward the County line, and west to Skamakowa. These areas are not under any official consideration at this time, but will need to be addressed in the future.

CROSS-CONNECTION CONTROL PROGRAM

An ordinance providing for the establishment of a cross-connection and backflow control program was prepared by the Town and became effective in July 1994. A copy of Ordinance 361 is contained in Appendix E. The adopted Cross-Connection Control Program and Resolution for the Town of Cathlamet is based on WAC 246-290-490 and the American Water Works Association Cross-Connection Control Manual. The following elements of a cross-connection control program have been implemented during the prior planning period: initial mail-in survey of all system customers inquiring about potential at-risk applications and follow up letter to non-responding customers. The next elements to be implemented in this Plan will be a staff review of potential at-risk customer responses and site visits to assess actual risk factors requiring corrective actions by customers. Cross-Connection Control is discussed in greater detail in Chapter 6, Operations and Maintenance.

SYSTEM EXTENSIONS

The water utility has prepared a priority list of capital improvement projects for water line extensions. Extensions not on the priority list will be at the developer's expense. Extensions will be constructed to the Town's standard specifications.

CONDITIONS OF SERVICE

DUTY TO SERVE

Per the Municipal Water Law and RCW 43.20.260, the Town has a duty to provide retail water service within its retail service area if:

- Its service can be available in a timely and reasonable manner;
- The municipal water supplier has sufficient water rights to provide the service;
- The municipal water supplier has sufficient capacity to serve the water in a safe and reliable manner as determined by the department of health; and
- It is consistent with the requirements of any comprehensive plans, development regulations, or any other applicable plan or regulation.

The system will provide service for residential, commercial, industrial or other uses as authorized under the Town Code subject to the availability of water and the number of approved connections permitted on the Water Facilities Inventory as approved by the DOH.

CUSTOMER RESPONSIBILITIES

The customer shall provide space for and exercise proper care to protect the System's property on their premises. This shall include meters, meter pit, meter boxes, fittings, pipes and other facilities installed by and remaining the property of the system. In the event of loss or damage to the System's property because of the customer's negligence or abuse, the customer will be required to pay the cost of repairs or replacement.

CONNECTION FEE SCHEDULE

The connection fee schedule is included in various resolutions. Table 1-5 summarizes connection fees.

TABLE 1-5

Connection Fee Schedule

Fee Schedule	Within Town Limits	Outside Town Limits
2021	$3,000 plus cost of labor and materials	$5,000 plus cost of labor and materials

METER AND MATERIAL SPECIFICATIONS

The Meter and Material Specifications are included in the Standards and Specifications for the Town of Cathlamet.

CONSENT AGREEMENTS FOR INSPECTION, MAINTENANCE AND REPAIRS THAT DISRUPT SERVICE

The application for water service contains a consent agreement relating to line disruption, on-site inspection of facilities, and other items which affect the use and benefit of the water. For specifics, see the water application form and Chapter 13 of the Town's Code, which can be found in Appendix F.

CROSS-CONNECTION CONTROL REQUIREMENTS

Applications for water service are screened to determine whether cross-connection control devices are required as a condition of service. Since a cross-connection control ordinance has been adopted, the water utility requires cross-connection control devices for specific uses, and is currently obtaining staff training in order to monitor and inspect existing backflow assembly device installations.

LATECOMER PAY BACK

Latecomers connecting to waterlines constructed under a latecomer agreement with the water utility will be required to pay all latecomer fees to the water utility at the time of hookup. The water utility distributes the latecomer fees in accordance with the latecomer agreement.

DEVELOPER EXTENSION REQUIREMENTS, DESIGN STANDARDS, FINANCIAL RESPONSIBILITY, P.E. DESIGN REQUIRED

Developers are responsible for designing water main extensions in accordance with the Town's design standards. Plans are to be prepared by the Developer's licensed professional engineer (P.E.) and reviewed and approved by the Town or Town's Engineer as a condition of final plat approval or extension agreement if no plat is involved. The Developer is responsible for securing all necessary easements and rights of way for extension of facilities. Construction is completed by the Developer and inspected by the Town or Town's Engineer. All improvements belong to the Developer until accepted by the Town. See Standard Construction Specifications, Appendix D.

POLICY FOR DEALING WITH COMPLAINTS

The Town's formal customer complaint form is available at Town Hall. Billing related questions are dealt with by the Clerk and water quality and supply issues are directed to the water system supervisor. The Clerk or Water Supervisor verbally notifies customers making complaints of the action that will follow and the action is noted on the complaint form. If unsatisfied, the customer may present their issue to the Mayor and Town Council at the next regularly scheduled Council meeting.

RECORD KEEPING

Water production is measured at the treatment plant and recorded on a daily basis, 365 days per year.

Residential, commercial, and intertie meters are read monthly.

Water quality sampling and analysis is performed and recorded as required by DOH and is discussed in more detail in Chapter 3.

CHAPTER 2

BASIC PLANNING DATA

INTRODUCTION

Basic planning data essential for the assessment of the Town of Cathlamet's water demands are presented in this chapter. Information is included regarding historical growth and water demands, population projections based on growth rates seen over the last 10 years, and water demand projections. Information presented is used to evaluate the condition of the existing system and determine future needs based on foreseeable demographic trends for the next 20 years.

CURRENT POPULATION, SERVICES, AND WATER DEMAND

HISTORICAL RESIDENTIAL POPULATION

The Town of Cathlamet's population over the last 10 years is shown in Table 2-1.

TABLE 2-1

Town of Cathlamet Historical Population (2011-2021)

Year	Population(1)	Growth Rate
2011	530	-0.38%
2012	525	-0.94%
2013	500	-4.76%
2014	500	0.00%
2015	490	-2.00%
2016	490	0.00%
2017	490	0.00%
2018	490	0.00%
2019	520	6.12%
2020	560	7.69%
2021	560	0.00%
Average Annual Growth 2011-2021		**0.52%**
Average Annual Growth 2016-2021		**2.30%**

(1) Source: Washington State Office of Financial Management (OFM) postcensal estimates of population.

As shown in Table 2-1, the Town of Cathlamet's year 2021 population was estimated to be 560. Between 2011 and 2018 the Town's population saw mostly negative or zero growth, however between 2019 and 2020 there was a slight increase. Taking the average over the full period from 2011-2021 results in a much lower estimated growth rate, which may not accurately represent future population trends in the area. For the purposes of project growth in this Plan, taking an average from the most recent years is a more conservative estimate. Over the past five years, the Town's population has increased at an average annual rate of 2.30 percent.

Table 2-2 shows the historical population of unincorporated Wahkiakum County.

TABLE 2-2

Wahkiakum County Historical Population (2011-2021)

Year	Population(1)	Growth Rate
2011	4,000	0.55%
2012	4,025	0.63%
2013	4,020	-0.12%
2014	4,010	-0.25%
2015	3,980	-0.75%
2016	4,000	0.50%
2017	4,030	0.75%
2018	4,100	1.74%
2019	4,190	2.20%
2020	4,422	5.54%
2021	4,475	1.20%
Average Annual Growth 2011-2021		**1.20%**
Average Annual Growth 2016-2021		**1.99%**

(1) Source: Washington State Office of Financial Management (OFM) postcensal estimates of population.

As shown in Table 2-2, the population in Wahkiakum County has shown trends similar to that of Cathlamet, with a general downward trend between 2011 and 2015, and then increasing population since 2016. Taking a similar approach and looking at the average growth over the most recent five years, the average annual population growth rate is 1.99 percent from 2017 to 2021.

SERVICE AREA POPULATION

Since a large portion of the Town's water service area is outside the Town Limits, the total population served by the water system can be estimated from the number of water service connections. The current estimated total population within the Town of Cathlamet water service area boundary for 2021 is shown in Table 2-3.

The current total population within the Town limits was determined from OFM data as 560. The number of residents outside the Town limits served by the Town's water system was estimated by applying the ratio of the known residential population (560 people) within Town limits to the number of water services inside the Town Limits (225), or

2.4 people per service connection. Therefore, the estimated population served by the water system outside Town Limits is 884 (355 services outside * 2.4 people per service connection). In addition, the Town of Cathlamet sells finished water to the Wahkiakum County PUD for the Puget Island Water System through a metered intertie, as described in Chapter 1. Population for the Puget Island Water System is estimated using the same ratio. According to Wahkiakum PUD, Puget Island had 555 service connections in 2021. So, the estimated population for Puget Island is approximately 1,332 (555 services * 2.4 people per service connection). The total estimated population served by the Town is 2,776.

TABLE 2-3

2021 Cathlamet Water System Estimated Service Area Population

Area	Population
Inside Town	560
Outside Town(1)	884
Puget Island(1)	1,332
Total	**2,776**

(1) Estimated based on number of service meters multiplied by 2.4 people per service connection inside the Town Limits.

SERVICE CONNECTIONS

Table 2-4 lists the Town of Cathlamet's service connections inside and outside the Town Limits. As shown in Table 2-4, the total number of active service connections at the end of the year 2021 was 673. There were 579 residential and 93 commercial connections. Single-family and multi-family residences are not tracked separately by the Town. The Puget Island Water System intertie is considered one service connection in Table 2-4.

TABLE 2-4

Year 2021 Service Connections(1)(2)

Customer Classification	Service Connections Inside Town Limits	Service Connections Outside Town Limits	Total
Residential	224	355	579
Commercial	70	23	93
Puget Island	0	1	1
Total	294	379	673

(1) Number of connections was taken by counting costumer accounts provided by metered consumption data.
(2) Accounts with no usage were not included in the count.

WATER USE DATA COLLECTION

Water production is metered at the water treatment plant daily. All water use at the WTP is metered including the raw water pumps, treated water, filter backwash, and finished water.

Production History

Table 2-5 provides a summary of the total volume of water produced from 2015 through 2021. Filter backwash water was added to the total volume of finished water to calculate the total volume of water which is pumped from the Elochoman River. A graph of the monthly production totals is shown in Figure 2-1.

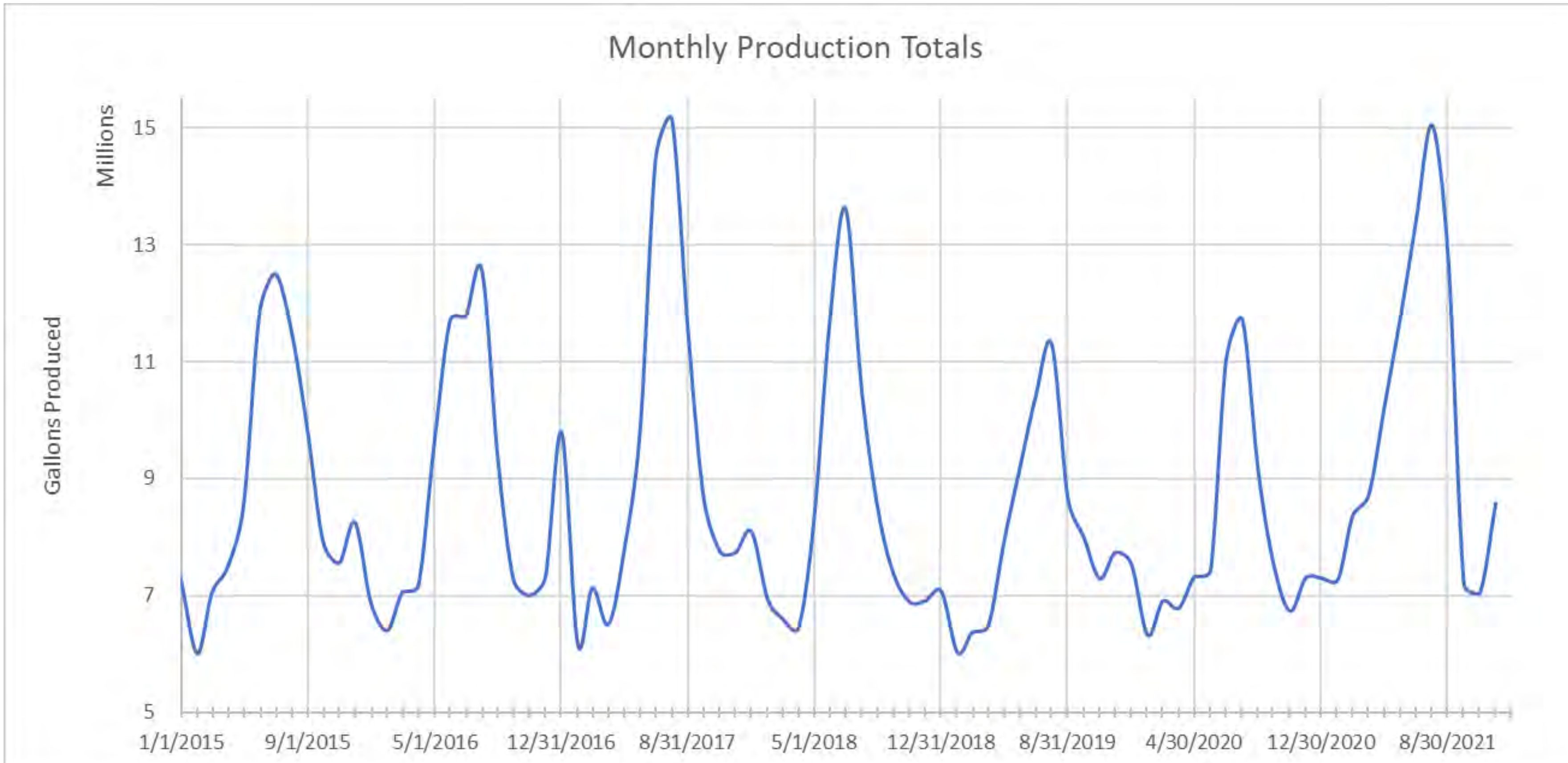


FIGURE 2-1

Monthly Production Totals from 2015 through 2021

TABLE 2-5

Historical Water Production (2015-2021)

Year	Finished Water (gallons)	Filter Backwash (gallons)	Total Production(1) (gallons)
2015	91,920,000	13,886,000	105,806,000
2016	92,281,000	11,750,000	104,031,000
2017	93,425,000	19,129,000	112,554,000
2018	90,450,000	11,453,000	101,903,000
2019	82,805,000	13,665,000	96,470,000
2020	84,061,000	11,674,000	95,735,000
2021	104,953,000	12,726,000	117,679,000

(1) Equal to Finished Water plus Filter Backwash.

As shown in Table 2-5, the total production for the Town of Cathlamet has remained relatively stable over the last 7 years on a slight downward trend, except for 2021 which saw a spike in total production. As is described later in Table 2-12, much of this increase was due to an increase in distribution system leakage in 2021.

For the purposes of the following discussion, the term "production" includes all water produced at the Town's water treatment plant, including backwash. The average day production for the Town's sources in gallons per day (gpd) was calculated by dividing the total metered water production (as shown in Table 2-4) by 365 days per year (366 days during leap year). The average day production, along with the maximum day production, for 2015 through 2021 is shown in Table 2-6. Maximum day production was taken from the Town's production records. The Town tracks daily production for the water treatment plant and; therefore, has a record of the highest production days for each month. The ratio of maximum day production to average day production is shown in Table 2-6.

TABLE 2-6

Average and Maximum Day Production

Year	Average Day Production (gpd)	Maximum Day Production (gpd)	Maximum Day Production Date	Maximum Day Peaking Factor
2015	289,879	546,000	6/20/2015	1.88
2016	284,238	526,000	6/8/2016	1.85
2017	308,367	750,000	8/19/2017	2.43
2018	279,186	604,000	7/21/2018	2.16
2019	264,301	491,000	9/17/2019	1.86
2020	261,571	565,000	7/22/2020	2.16
2021	322,408	772,000	7/26/2021	2.39
Average				**2.11**
Maximum				**2.43**

Consumption History

The Town of Cathlamet's average day water consumption from 2015 through 2021 for each customer class is shown in Table 2-7. As seen in Table 2-7, total consumption has remained relatively stable over the last 7 years.

TABLE 2-7

Metered Consumption by Customer Class

Year	Residential (gallons)	Commercial (gallons)	Puget Island (gallons)	Total Consumption (gallons)
2015	26,282,463	13,115,899	31,974,884	71,373,246
2016	27,238,642	13,554,766	31,348,952	72,142,359
2017	26,840,719	12,106,253	32,436,006	71,382,978
2018	25,563,282	14,183,118	31,101,332	70,847,732
2019	26,415,048	11,759,101	31,923,426	70,097,574
2020	27,594,554	10,840,074	32,169,116	70,603,744
2021	29,093,541	12,202,531	31,363,935	72,660,008

Table 2-8 shows the percentage of water consumed by the Town compared to Puget Island since 2015. This has also remained relatively stable over the last 7 years.

TABLE 2-8

Percent Consumption by Puget Island

Year	Percent Consumption by Town of Cathlamet	Percent Consumption by Puget Island
2015	55%	45%
2016	57%	43%
2017	55%	45%
2018	56%	44%
2019	54%	46%
2020	54%	46%
2021	57%	43%
Average	**55%**	**45%**

Equivalent Residential Units

Use of Equivalent Residential Units (ERUs) is a way to express water use by non-residential customers as an equivalent number of residential customers. ERUs are calculated by dividing the total volume of water utilized in the single-family residential customer class by the total number of single-family residential connections. This number defines the average single-family residential water use. Since Cathlamet does not track single family and multi-family customers separately, the multi-family units are included in the ERU calculations for this Plan. Cathlamet has a limited number of multi-family housing units, so the effect on the ERU calculations is likely minimal. Table 2-9 shows the ERU_{ADD} values from 2015 through 2021.

TABLE 2-9

Equivalent Residential Units

Year	Residential Consumption (gpd)	Residential Service Connections	ERU Value (gpd/ERU)
2015	72,007	550	131
2016	74,423	546	136
2017	73,536	547	134
2018	70,036	564	124
2019	72,370	566	128
2020	75,395	573	132
2021	79,708	579	138
Average			**132**

The average volume of water consumed by a residential customer ranged from 124 gpd to 138 gpd since 2015. This range is much more consistent than the previous Plan, which had a range of 140-213 gpd. The 2021 ERU_{ADD} value will be used for projections in this Plan. Therefore, the average residential water use for the Town of Cathlamet (which is equivalent to one ERU_{ADD}) 138 gpd (79,708 gpd ÷ 579 residential connections).

The volume of water used by other customer classes can then be divided by the average residential water use to determine the equivalent residential units utilized by the other customer classes. The ERUs for all customer classes are shown in Table 2-10.

TABLE 2-10

2021 ERUs per Customer Class

Customer Class	Average Consumption (gpd)	Active Service Connections	ERUs	Number of ERUs per Connection
Residential	79,708	579	579	1
Commercial	33,432	93	243	3
Puget Island [(1)]	85,929	1	624	624
Total	**199,069**	**673**	**1,446**	

(1) Puget Island is a wholesale customer and is considered one service connection.

Large Water Users

The largest water users that the Town of Cathlamet serves are listed in Table 2-11, along with their average day metered consumption for 2021. These customers account for approximately 54 percent of metered consumption in 2021. The majority of water consumed is by Puget Island.

TABLE 2-11

Year 2021 Large Water User Consumption

Customer	Customer Classification	2021 Average Metered Consumption	Percent of Total Consumption	Number of ERUs
Puget Island Water	Wholesale	85,929	43.17%	624
Wahkiakum School District	Commercial	5,619	2.82%	41
Cathlamet Trailer Park	Residential	5,223	2.62%	38
Crista Vista Society	Residential	3,236	1.63%	24
Port District #1	Commercial	2,621	1.32%	19
Water Plant	Commercial	1,351	0.68%	10
J.B.H. Municipal Pool	Commercial	1,252	0.63%	9
Wahkiakum High School	Commercial	1,213	0.61%	9
Residential Customer	Residential	1,012	0.51%	7
Residential Customer	Residential	834	0.42%	6
Total		**108,289**	**54%**	**787**

Distribution System Leakage

Distribution system leakage (DSL) is defined as the difference between metered source production and all accounted for authorized sources of water usage. Prior to DOH instituting the new Water Use Efficiency requirements, all non-revenue water was called "lost and unaccounted for water." However, under the current rules, all non-revenue water is simply considered DSL, whether it is resulting from actual leakage in the distribution system or is caused by some other factor such as unmetered usage, unaccounted for hydrant flushing, or inaccurate meters. Table 2-12 summarizes the distribution system leakage for water for 2015 through 2021.

TABLE 2-12

Distribution System Leakage

Year	Finished Water Production(1) (gallons)	Metered Consumption (gallons)	DSL (gallons)	DSL (%)	3-year Rolling Average
2015	91,920,000	71,373,246	20,546,754	22.35%	20.85%
2016	92,281,000	72,142,359	20,138,641	21.82%	21.93%
2017	93,425,000	71,382,978	22,042,022	23.59%	22.59%
2018	90,450,000	70,847,732	19,602,268	21.67%	22.36%
2019	82,805,000	70,097,574	12,707,426	15.35%	20.20%
2020	84,061,000	70,603,744	13,457,256	16.01%	17.68%
2021	104,953,000	72,660,008	32,292,992	30.77%	20.71%

(1) Equal to the volume of finished water that left the water treatment plant, does not include filter backwash water.

As shown in Table 2-12, the Town's DSL had been generally decreasing from 2015 until 2021 when DSL was dramatically higher. In 2021, DSL was 32,292,992 gallons, or approximately 88,500 gpd, or equivalent to 643 ERUs. The total finished water production for 2021 equates to 2,089 ERUs, which includes residential use, commercial use, and DSL. The 2021 3-year rolling average DSL was 20.71 percent. This is higher than the 10 percent standard included in the Water Use Efficiency Rule.

Per Capita Water Production

The estimated per capita water production for Cathlamet and Puget Island is shown in Table 2-13. As shown, the estimated per capita production is 116 gallons per capita-day (gpcd) and is comprised of residential, commercial, and distribution system leakage components. The estimated per capita water production has increased since the previous Water System Plan.

TABLE 2-13

Year 2021 Estimated Per Capita Water Production

Estimated Service Area Population(1)	Average Daily Production(2) (gpd)	Estimated per Capita Production (gpcd)
2,776	322,408	116

(1) Estimated population of Cathlamet service area and Puget Island.
(2) Total production from Table 2-5, including backwash water, divided by 365.

FUTURE POPULATION AND WATER DEMANDS

PROJECTED POPULATION

The Town of Cathlamet Comprehensive Plan as adopted in 2002 so it no longer has relevant population projections. The draft Wahkiakum County Comprehensive Plan was developed in 2006, but was never adopted by the County Commissioners. Therefore, the best available information regarding projected population is recent historical growth. As seen in Table 2-1, the Town's population has grown approximately 2.3 percent over the last 5 years. This growth rate will be used to project future population growth for the water system. Table 2-14 summarizes the projected population for the 20-year planning period using this growth rate.

TABLE 2-14

Projected Service Area Population

Year	Cathlamet Population(1)	Outside Town Limits Population(1)	Puget Island Population(1)	Total Population Served
2022	573	904	1,363	2,839
2023	586	925	1,394	2,905
2024	600	946	1,426	2,972
2025	613	968	1,459	3,040
2026	628	990	1,493	3,110
2027	642	1,013	1,527	3,182
2028	657	1,036	1,562	3,255
2029	672	1,060	1,598	3,330
2030	687	1,084	1,635	3,407
2031	703	1,109	1,672	3,485
2032	719	1,135	1,711	3,565
2033	736	1,161	1,750	3,647
2034	753	1,188	1,791	3,731
2035	770	1,215	1,832	3,817

TABLE 2-14 – (continued)

Projected Service Area Population

Year	Cathlamet Population(1)	Outside Town Limits Population(1)	Puget Island Population(1)	Total Population Served
2036	788	1,243	1,874	3,905
2037	806	1,272	1,917	3,995
2038	825	1,301	1,961	4,087
2039	844	1,331	2,007	4,181
2040	863	1,362	2,053	4,277
2041	883	1,393	2,100	4,376
2042	903	1,425	2,148	4,477
2043	924	1,458	2,198	4,580

(1) Population growth of 2.3 percent per year.

WATER DEMAND PROJECTIONS

An essential component of the Plan is to project water demands during the 10-year and 20-year planning periods. As noted, the three types of demand that are considered in this Plan include average day, maximum day, and peak hourly. Average day demand is projected using the number of ERUs and the average day consumption per ERU. For this Plan, an ERU is equivalent to 138 gpd.

Table 2-15 shows the projected consumption over the next 20 years.

TABLE 2-15

Projected Population, ERUs, and Average Day Consumption

Year	Total Cathlamet Population Served	Cathlamet Projected ERUs(1)	Cathlamet Average Day Consumption(2) (gpd)	Puget Island Projected ERUs(1)	Puget Island Average Day Consumption(2) (gpd)
2022	1,477	841	115,800	639	88,000
2023	1,511	860	118,500	653	90,000
2024	1,546	880	121,200	668	92,100
2025	1,581	900	124,000	684	94,200
2026	1,618	921	126,800	699	96,300
2027	1,655	942	129,700	716	98,600
2028	1,693	964	132,700	732	100,800
2029	1,732	986	135,800	749	103,100
2030	1,772	1,009	138,900	766	105,500
2031	1,813	1,032	142,100	784	107,900

TABLE 2-15 – (continued)

Projected Population, ERUs, and Average Day Consumption

Year	Total Cathlamet Population Served	Cathlamet Projected ERUs(1)	Cathlamet Average Day Consumption(2) (gpd)	Puget Island Projected ERUs(1)	Puget Island Average Day Consumption(2) (gpd)
2032	1,854	1,056	145,400	802	110,400
2033	1,897	1,080	148,700	820	113,000
2034	1,941	1,105	152,200	839	115,600
2035	1,985	1,130	155,700	858	118,200
2036	2,031	1,156	159,200	878	121,000
2037	2,078	1,183	162,900	898	123,700
2038	2,126	1,210	166,700	919	126,600
2039	2,175	1,238	170,500	940	129,500
2040	2,225	1,267	174,400	962	132,500
2041	2,276	1,296	178,400	984	135,500
2042	2,328	1,326	182,500	1,007	138,600
2043	2,382	1,356	186,700	1,030	141,800

(1) ERUs are project to increase at the same rate as population, 2.3 percent.
(2) Projected average day consumption = ERUs * 138 gpd/ERU (rounded to the nearest 100 gpd).

To project demand, the percentage of DSL was assumed to remain at the current 3-year rolling average of 20.71 percent. Table 2-16 summarizes the projected average day finished water demand through year 2043.

TABLE 2-16

Projected Average Day Finished Water Demand Through the Year 2043

Year	Total Maximum Day Consumption(1) (gpd)	Total Average Day Consumption (gpd)	DSL(2) (gpd)	Total Average Day Finished Water Demand (gpd)	Filter Backwash(3) (gpd)	Total Average Day Production(4) (gpd)
2022	495,675	203,800	53,300	257,100	38,011	295,111
2023	507,107	208,500	54,500	263,000	38,884	301,884
2024	518,781	213,300	55,800	269,100	39,785	308,885
2025	530,699	218,200	57,000	275,200	40,687	315,887
2026	542,616	223,100	58,300	281,400	41,604	323,004
2027	555,263	228,300	59,700	288,000	42,580	330,580
2028	567,911	233,500	61,000	294,500	43,541	338,041
2029	581,044	238,900	62,400	301,300	44,546	345,846
2030	594,421	244,400	63,900	308,300	45,581	353,881
2031	608,041	250,000	65,300	315,300	46,616	361,916
2032	622,148	255,800	66,900	322,700	47,710	370,410

TABLE 2-16 – (continued)

Projected Average Day Finished Water Demand Through the Year 2043

Year	Total Maximum Day Consumption(1) (gpd)	Total Average Day Consumption (gpd)	DSL(2) (gpd)	Total Average Day Finished Water Demand (gpd)	Filter Backwash(3) (gpd)	Total Average Day Production(4) (gpd)
2033	636,498	261,700	68,400	330,100	48,804	378,904
2034	651,334	267,800	70,000	337,800	49,943	387,743
2035	666,170	273,900	71,600	345,500	51,081	396,581
2036	681,493	280,200	73,200	353,400	52,249	405,649
2037	697,059	286,600	74,900	361,500	53,447	414,947
2038	713,354	293,300	76,600	369,900	54,688	424,588
2039	729,650	300,000	78,400	378,400	55,945	434,345
2040	746,432	306,900	80,200	387,100	57,231	444,331
2041	763,457	313,900	82,000	395,900	58,532	454,432
2042	780,968	321,100	83,900	405,000	59,878	464,878
2043	798,966	328,500	85,800	414,300	61,253	475,553

(1) Total Maximum Day Consumption was projected by applying a max day to average day peaking factor of 2.43 to the Total Average Day Consumption.
(2) DSL is assumed to be unchanged at 20.71 percent of the Total Average Day Finished Water Production.
(3) Filtered Backwash is assumed to be 15 percent of the Total Average Day Production, based on Water Treatment Plant Data.
(4) Total Average Day Production equals Total Average Day Finished Water Demand plus Filter Backwash.

Maximum day demand can be estimated using the historical ratio of maximum day demand to average day demand. As shown in Table 2-6, the maximum ratio of MDD/ADD was 2.43 in 2017. Therefore, ERU_{MDD} can be estimated as:

$$ERU_{MDD} = 138 \text{ gpd/ERU} * 2.43 = 335 \text{ gpd/ERU.}$$

The maximum quantity of water produced in a 1-hour period during a maximum day demand is the peak hour demand. If precise records of peak hour demand are not available, peak hour is often expressed in terms of a peaking factor. A peaking factor is defined as the ratio of peak hour to the maximum day demand. It is generally accepted that peak hour factors range from 1.5 to 2.5. The DOH Water System Design Manual provides a methodology for calculating peak hour demand (PHD). The generalized equation is as follows:

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

Where: PHD = *Peak Hourly Demand, (gallons per minute, gpm)*
C = *Coefficient Associated with Ranges of ERUs*
N = *Number of Service Connections, ERUs*

F = *Factor Associated with Ranges of ERUs*
ERU_{MDD}= *Maximum Day Demand, (gpd/ERU)*

It was previously determined that an ERU was equal to 138 gpd. The total number of ERUs for the water system in the year 2021 was calculated by dividing the average day consumption of each customer class plus distribution system leakage by 138 gpd. The result is a total system ERU value for 2021 of 1,825.

The values for C and F of the peak hour demand formula are taken from the DOH Water System Design Manual, Table 3-1, page 37. C is equal to 1.6 and F is equal to 225.

To make realistic projections of peak hour demand (PHD), the total projected number of ERUs is inserted into the above equation for each year for the 20-year planning period. The formula is simplified to:

$$PHD = (335 / 1440) * [(1.6) * N + 225] + 18$$

$$PHD = 0.38N + 70$$

Table 2-17 summarizes peak hour demand forecasts through the year 2043.

TABLE 2-17

Projected Maximum Day and Peak Hour Demands(1)
Through Year 2043 Assuming Distribution System Leakage is Unchanged

Year	Total ERUs	Total Projected MDD(2) (gpd)	Total Projected PHD(3) (gpm)
2022	1,868	587,000	785
2023	1,910	600,500	801
2024	1,955	614,400	818
2025	1,999	628,400	835
2026	2,044	642,600	853
2027	2,092	657,600	871
2028	2,139	672,500	889
2029	2,189	688,000	908
2030	2,239	704,000	927
2031	2,290	720,000	947
2032	2,344	736,800	967
2033	2,398	753,800	988
2034	2,454	771,300	1,009
2035	2,510	788,900	1,031
2036	2,567	807,000	1,053
2037	2,626	825,500	1,075

TABLE 2-17 – (continued)

Projected Maximum Day and Peak Hour Demands[1] Through Year 2043 Assuming Distribution System Leakage is Unchanged

Year	Total ERUs	Total Projected MDD[2] (gpd)	Total Projected PHD[3] (gpm)
2038	2,687	844,700	1,098
2039	2,749	864,000	1,122
2040	2,812	883,900	1,146
2041	2,876	904,000	1,171
2042	2,942	924,800	1,196
2043	3,009	946,100	1,222

(1) Demands in this table represent demands on the system, they do not include filter backwash water, and therefore do not represent demand on the raw water pumps.

(2) Maximum day demand was projected by adding together the Total Maximum Day Consumption and DSL.

(3) Peak hour demand was projected by applying the DOH Water System Design Manual equation for peak hour demand (see above).

CHAPTER 3

SYSTEM ANALYSIS

INTRODUCTION

The purpose of this chapter is to determine if the existing water system facilities are able to supply sufficient quality and quantity of water to meet existing and projected demands. In this section, these major planning components will be analyzed:

- Water Design Standards
- Water Quality
- Facility Analysis
- Water System Physical Capacity Analysis
- Water System Deficiencies
- Asset Management

WATER SYSTEM STANDARDS

The Town complies with water quality standards established by the Washington State Department of Health.

Design standards established by the Washington State Department of Health are used to evaluate the Town's water system in this Chapter.

The Town also complies to its own set of Standard Specifications for Water Main Construction.

WATER QUALITY ANALYSIS

Introduction

Group A public community water systems must comply with the drinking water standards of the federal Safe Drinking Water Act and its amendments. The Washington State Department of Health (DOH) adopted the federal standards under WAC 246-290, which became effective April 27, 2003. This chapter describes the water quality parameters necessary to ensure the delivery of safe potable drinking water to the Town's customers. This chapter also evaluates the Town's efforts to comply with required regulations and testing requirements. The Town has a surface water supply, so surface supply regulations apply.

The quality of the source water for its drinking water system is of primary concern to the Town. The Town has historically provided a high quality of drinking water to its service area and currently complies with all water quality monitoring requirements. The Town's water quality monitoring program meets the sampling frequency prescribed by DOH regulations. The Town publishes an annual consumer confidence report, titled *Annual Water Quality Report Town of Cathlamet* in an effort to keep consumers informed as to the quality of both their water supply and water delivery systems.

The following water quality issues are discussed in this chapter:

- Description of both current and future drinking water quality regulations, as they apply to the Town's water system;
- Evaluation of the Town's drinking water quality; and
- Schedule for future water quality monitoring.

The Safe Drinking Water Act (SDWA) of 1974, amended in 1986 and 1996, established specific roles for the federal government, state government, and water system purveyors, with respect to water quality monitoring. The U.S. Environmental Protection Agency (EPA) is authorized to develop national drinking water regulations and oversee the implementation of the SDWA. State governments are expected to adopt the federal regulations and accept primary responsibility or "primacy" for administration and enforcement of the Act. Public water system purveyors are assigned the day-to-day responsibility of meeting regulations by incorporating monitoring, recording, and sampling procedures into their operation and maintenance programs.

Water Quality Standards

Table 3-1 lists drinking water regulations, the affected contaminants, and indicates which regulations require the Town to conduct monitoring or take other action. Existing State law contains regulations for bacteriological contaminants, inorganic chemicals and inorganic physical parameters (IOCs), volatile organic chemicals (VOCs), synthetic organic chemicals (SOCs), radionuclides, and total trihalomethanes (TTHMs).

The implementation schedules for the proposed new regulations are subject to revision and the Town should continue to stay informed regarding regulatory deadlines.

TABLE 3-1

Drinking Water Regulations[(1)]

Drinking Water Regulation[(1)]	Contaminants Affected[(2)]	Town Action
Consumer Confidence Report	Reporting Only	Reporting
Inorganic Chemicals and Physical Parameters	IOCs	Monitoring
Arsenic Rule	Arsenic	Monitoring
Volatile and Synthetic Organic Compounds	VOCs, SOCs	Monitoring
Revised Total Coliform Rule	Coliform	Monitoring
Residual Disinfectant	Total Free Chlorine	Monitoring
Asbestos	Asbestos	Monitoring
Lead and Copper Rule	Lead, Copper	Monitoring
Revised Lead and Copper Rule	Lead, Copper	Future Monitoring: Monitoring requirements change 2024
Radionuclide Rule	Radionuclides	Monitoring
Disinfectants/Disinfection Byproducts Rule (Stages I and II)	TTHMs, HAA5, Chlorite, Bromate	Monitoring
Unregulated Contaminant Monitoring Rule	IOCs, VOCs, SOCs	Monitoring
Per- and Polyfluoroalkyl Substances	PFAS	Future Monitoring: Report Initial Sample by December 31, 2025
Surface Water Treatment Rule	Microbial Contaminants	Monitoring
Interim Enhanced Surface Water Treatment Rule	Bacteriological	Not Applicable
Long-Term 1 Enhanced Surface Water Treatment Rule	Bacteriological	Monitoring
Long-Term 2 Enhanced Surface Water Treatment Rule	Bacteriological	Monitoring
Filter Backwash Recycling Rule	Bacteriological	Not Applicable
Groundwater Rule	Bacteriological	Not Applicable
Information Collection Rule	Bacteriological	Not Applicable

(1) Drinking water regulations as of March 2022.

(2) TTHM = total trihalomethanes; HAA5 = five haloacetic acids; IOCs = inorganic chemical and physical characteristics; VOCs = volatile organic chemicals; SOCs = synthetic organic compounds.

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 further in the following pages and tables. The following sections discuss the applicable water quality regulations, analysis of the Town's compliance with these regulations, and a summary of anticipated future regulations. A water quality monitoring schedule is presented at the end of this section.

Consumer Confidence Report

This rule was finalized on August 19, 1998. The Consumer Confidence Report Rule requires community water system purveyors to prepare and distribute an annual report of water quality analyses to their customers. The Town is required to submit the report to its customers by the 1st of July each year. The Town's most recent report is provided in Appendix G of this Plan.

Source Water Quality

As described in Chapter 1, The Town has a single surface water source, the Elochoman River. The treatment processes provided for the Town's source are coagulation, filtration, disinfection (chlorination) and fluoridation. Issues regarding chlorination and fluoridation are addressed under the heading Delivered Water Quality.

During the summer months, raw water turbidity within the treatment plant ranges from 2 to 10 NTU. In the winter when turbidity spikes occur, the raw water can range from 10 to 60 NTU. Turbidity in the river is likely higher than the raw water that enters the plant due to the filtering capacity of the gravel in the riverbed where the intake structure is located.

Monthly water treatment reports include basic raw water data, including raw water turbidity, temperature and pH. These tests are conducted at the entry to the water treatment plant and may be different from water quality data directly from the Elochoman River.

Inorganic Physical and Chemical Characteristics

This category includes several inorganic elements and compounds. Many of the inorganic chemicals include elemental metals such as mercury, arsenic, and iron. Some non-metallic constituents such a chloride, fluoride, and sulfate are also included. Physical properties that affect water quality in this category include turbidity, specific conductivity, total dissolved solids, and color.

WAC 246-290-310 specifies primary and secondary MCLs for inorganic physical and chemical characteristics. Primary MCLs are based on health effects, and secondary

MCLs are based on non-health factors, 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. Primary and secondary MCLs for inorganic chemical and physical characteristics are summarized in Tables 3-2 and 3-3, respectively. Inorganic water quality analysis for the Town's source, the Elochoman River, is summarized in Table 3-4.

TABLE 3-2

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)
Cyanide (HCN)	0.2 mg/L
Fluoride (F)	4.0 mg/L
Lead (Pb)	0.015 mg/L (Action Level)
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.

TABLE 3-3

**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
Hardness	None Established
Specific Conductivity	700 µmhos/cm
Total Dissolved Solids (TDS)	500 mg/L

Source: WAC 246-290-310.

Arsenic

Arsenic is an inorganic chemical that has received significant attention due to recent rule revisions. Long-term exposure to low concentrations of arsenic in drinking water can lead to skin, bladder, lung, or prostate cancer. Noncancer effects of ingesting arsenic at low levels include cardiovascular disease, diabetes, and anemia, as well as reproductive, developmental, immunological, and neurological effects. Arsenic has not been detected in sampling completed by the Town.

Iron and Manganese

As shown in Table 3-4, manganese have been detected in the Elochoman River and iron has not been. The last time iron exceeded secondary water quality standards was in 1991 when a sample measured at 3.2 mg/L and the last time manganese exceeded MCL standards was in 1979 when a sample measured 0.085 mg/L. There have been no exceedances of the iron and manganese secondary MCLs since 1991. As Table 3-4 indicates, iron and manganese levels are generally well below the MCLs.

TABLE 3-4

Inorganic Source Water Quality(1)

Primary Regulated		Elochoman River
Parameter	**MCL**	**Result Quantity(1)**
Nitrate – N	10.0 mg/L	0.5
Secondary Regulated		
Fluoride	4.0 mg/L	0.78
Manganese	0.05 mg/L	0.006
Chloride	250 mg/L	6.27
Sulfate	250 mg/L	3.76
State Regulated		
Sodium	20 mg/L(2)	7.18
Hardness	None Established	22.1
Conductivity	700 µmhos/cm	98.7
TDS	500 mg/L	64.5

(1) Results from sample taken on 10/10/2019. The table shows only those parameters which were detected in the sample.
(2) EPA has established a recommended limit of 20 mg/L for consumers with dietary restrictions related to sodium intake.

Finished Water Quality

Turbidity

Finished water turbidity is reported on Water Treatment Plant Monthly Reports. The SCADA system continuously records turbidity, reporting it every 4 hours starting at 4:00 a.m. each day. To be in compliance the finished water turbidity must be less than 0.3 NTU 95 percent of the time and always less than 1.0 NTU. Water Treatment Plant Monthly Reports were reviewed for the time period from January 2015 through April 2022. The daily turbidity samples were reviewed to determine the minimum and maximum turbidity readings for each month and the monthly average turbidity was taken directly from the reports. The finished water turbidity during the data period was less than 0.3 NTU 95 percent and never exceeded 1 NTU.

The Department of Health developed the Treatment Optimization Program, which was created to improve the performance of water treatment facilities and includes goals for filtration, sedimentation, disinfection, and turbidity monitoring that go above and beyond the minimum required parameters. A copy of these goals can be found in Appendix H. The Town of Cathlamet is currently meeting some of these goals and going forward will work towards optimizing their treatment plant operations to meet the remaining goals.

Volatile Organic Compounds and Synthetic Organic Compounds

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 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 VOCs and 33 regulated SOCs. A list of these compounds and their MCLs is included in Tables 3-5 and 3-6.

Per DOH requirements, SOCs and VOCs must be sampled once every 3 years, unless a waiver is in place. The Town last sampled for VOCs in September, 2018 and has a 6-year waiver, so the next round of testing does not have to be completed until 2024. Additionally, the Town last sampled for SOCs in November, 2018. There has not been any detectable VOCs or SOCs since the last Plan.

TABLE 3-5

Regulated Volatile Organic Chemicals

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
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

TABLE 3-5 – (continued)

Regulated Volatile Organic Chemicals

Volatile Organic Chemical	Federal Regulation	Primary MCL (mg/L)$^{(1)}$
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) and (c); adopted by State Board of Health.

TABLE 3-6

Regulated Synthetic Organic Chemicals

Synthetic Organic Chemical	Federal Regulation	Primary MCL (mg/L)$^{(1)}$
Arochlor	Phase II	0.002
Aldicarb	Phase II	0.003
Aldicarb sulfone	Phase II	0.002
Aldicarb sulfoxide	Phase II	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
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

TABLE 3-6 – (continued)

Regulated Synthetic Organic Chemicals

Synthetic Organic Chemical	Federal Regulation	Primary MCL (mg/L)[(1)]
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) and (c); adopted by State Board of Health.

Delivered Water Quality

Delivered water quality applies to a number of water quality monitoring requirements of the water distribution system. Monitoring of delivered water quality is necessary because some water quality parameters have been demonstrated to change in the distribution system, or even in the plumbing of buildings. Chlorine residual decays in the distribution system, coliform bacteria can grow or can be introduced into the distribution system, disinfectant byproducts develop in the distribution system, asbestos is released into the distribution system from asbestos-concrete pipes, and water that is excessively corrosive dissolves lead and copper from building plumbing. For these reasons, distribution system or delivered water quality monitoring is required. The following sections summarize delivered water quality monitoring by the Town.

Coliform Bacteria Monitoring

<u>Introduction</u>

WAC 246-290-300(3) sets distribution system coliform monitoring requirements, and WAC 246-290-310(2) sets coliform bacteria maximum contaminant levels. The Revised Total Coliform Rule (RTCR) went into effect on April 1, 2016. RTCR describes an E. coli MCL violation, which can occur in four ways:

1. A total coliform-present repeat sample follows and E. coli-present routine sample.

2. An E. coli-present repeat sample follows a total coliform-present routine sample.

3. The lab fails to test a total coliform-present repeat sample for E. coli.

4. A system fails to take 3 repeat samples following an E. coli-present routine sample.

The RTCR also describes "Treatment Technique Triggers," which can occur in certain situations when multiple samples are E. coli-present and/or total coliform-present. A Treatment Technique Trigger results in the requirement for the water system to complete an assessment in order to address the source of the bacterial contamination. The assessment can be either a less detailed Level 1 Assessment or a more detailed Level 2 Assessment, depending on the nature of the trigger. For additional details on the RTCR and Treatment Technique Triggers, see DOH Publication #331-556, Revised Total Coliform Rule.

Monitoring Requirements and Analysis

The Town monitors for bacteriological contaminants in accordance with its Coliform Monitoring Plan, found in Appendix I. The number of required monthly samples is provided annually from DOH on the Water Quality Monitoring Report. The Town is required to collect two samples per month.

The Town had two samples since the last Plan that exceeded the state limits for coliform. These occurred August 5th and 6th of 2021 and the tests found total coliform present and E. coli absent. Since the August 6th (follow up) test found coliform present, a level 2 assessment was performed. No additional exceedances occurred.

Residual Disinfectant

According to WAC 246-290-300, systems providing disinfection treatment shall measure residual disinfectant concentration within the distribution system when taking routine or repeat coliform samples. The Town complies with this requirement and records chlorine residuals along with coliform sampling results. The Town's chlorination regulation is to maintain a detectable residual chlorine concentration within the distribution system. Chlorine residual concentrations are monitored during bacteriological sampling and no violations have occurred.

Asbestos

Introduction

Asbestos is the name for a group of naturally occurring, hydrated silicate minerals with fibrous morphology. Included in this group are chrysotile, corcidolite, amosite, and the fibrous varieties of anthophyllite, tremolit, and actinolite. Most commercially mined asbestos is chrysotile. Asbestos' flexibility, strength, and chemical and heat resistance properties that have adapted it to many uses including building insulation, brake linings, and water pipe.

In recent years, there has been much concern with the health risks associated with asbestos. Several studies and case histories have documented the hazards to internal organs as a result of inhalation of asbestos fibers. Data is limited on the effects of ingestion of asbestos fibers or on the effects of inhalation exposure from drinking water. Ingestion studies have not caused cancer in laboratory animals, although studies of asbestos workers have shown increased rates of gastrointestinal cancer.

Monitoring Requirements and Analysis

Asbestos is listed as a primary inorganic contaminant; however, it is not routinely included in IOC samples for public water systems. Asbestos monitoring is to be conducted every 9 years unless a waiver is applied for and granted by DOH. The Town does not currently have an asbestos waiver. Since the last Plan, two asbestos tests were conducted June of 2021 and asbestos was not detected.

Taste and Odor

The Town handles water quality complaints pursuant to their policy for dealing with complaints as described in Chapter 1. In the case of ‘dirty’ water complaints, the water operator will generally check out the validity of the complaint by an on-site investigation and flush water mains if appropriate. The Town’s routine water main flushing program generally keeps water quality complaints to a minimum.

Lead and Copper

Introduction

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.

Ninety percent of the distribution system lead samples collected according to the procedures outlined in WAC 246-290 must have concentrations below the “Action Level” of 0.015 mg/L. Similarly, 90 percent of the copper samples must have concentrations less than 1.3 mg/L. If the 90th percentile concentration of either lead or copper from the group of samples exceeds these action levels, a corrosion control study must be undertaken to evaluate strategies and make recommendations for reducing the lead or copper concentration below the action levels. The rule requires systems that exceed the lead level to educate the affected public about reducing its lead intake. Systems that continue to exceed the lead action level after implementing corrosion control and source water treatment may be required to replace piping in the system that contains the source of lead. Corrosion control is typically accomplished by increasing the pH of the water to make it less corrosive, reducing its ability to break down water pipes and absorb lead or copper.

Monitoring Requirements and Analysis

Based on the requirements of the EPA Lead and Copper Rule (40 CFR 141), lead and copper monitoring must be completed for two consecutive 6-month monitoring periods. If lead and copper action levels are not exceeded, then the number of samples may be reduced to one-half the original number for three consecutive annual periods. Assuming compliance with the action level is maintained, reduced sampling may continue once every 3 years thereafter.

The Town last collected lead and copper samples August 2, 2019. Distribution system samples were taken at 10 locations. The results of the lead and copper testing conducted in 2019 are shown in Table 3-7. As shown, all of the lead and copper sample results indicate concentrations below the action levels.

As indicated in Table 3-7, the Town is in compliance with the Lead and Copper Rule. The 90 percentile lead level from the last testing was 4 ppd, well below the threshold level for additional testing anticipated in the Revised Lead and Copper Rule.

TABLE 3-7

Lead and Copper Testing Results

Parameter	2019
Lead	
Action Level (mg/L)	**0.015**
Maximum Concentration (mg/L)	0.004
90^{th} Percentile Concentration (mg/L)	0.002
Number of Samples Taken	10
Number of Samples Exceeding Action Level	0
Copper	
Action Level (mg/L)	**1.3**
Maximum Concentration (mg/L)	0.614
90^{th} Percentile Concentration (mg/L)	0.405
Number of Samples Taken	10
Number of Samples Exceeding Action Level	0

Revised Lead and Copper Rule

The Revised Lead and Copper Rule (RLCR) will focus on replacing 100 percent of lead service lines and establishing a “trigger level” and “action level” for each containment. The EPA has also signaled its intent to test for lead and copper in schools and child care facilities. Water systems will be required to identify and make public the locations of lead service pipes. These revised regulations will take effect in October of 2024. The Town is not aware of any lead service lines within the system.

Radionuclides and Radon

Introduction

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.

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

Monitoring Requirements and Analysis

WAC 246-290-300(10) and 40 CFR 141.26 require two radionuclide samples once every 3 years from each source. 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. The Town is currently in compliance since all samples collected since the last Plan resulted below the detection level.

Disinfectants and Disinfection Byproducts Rule

Introduction

WAC 246-290-300(6) requires purveyors of public water systems that provide water treated with chemical disinfectants to monitor for disinfectants and disinfection byproducts. The Disinfection/Disinfectants Byproduct Rule (D/DBP Rule) establishes residual disinfectant concentrations and maximum contaminant levels for disinfection byproducts.

Trihalomethanes (THMs) and HAA5 are a group of organic compounds that can be formed as a result of drinking water disinfection by chlorine and are; therefore, often referred to as disinfection byproducts. TTHMs include the sum of the concentrations of four disinfection byproducts: chloroform, bromoform, bromodichloromethane, and dibromochloromethane.

Monitoring Requirements and Analysis

The Stage 1 D/DBP rule became effective in February 1999 and established the MCLs for TTHM and HAA5 at 80 μg/L and 60 μg/L, respectively, based on the running annual average of four quarterly samples. The Stage 1 D/DBP Rule remained in effect for compliance until October 1, 2013.

Stage 2 of the D/DBP Rule was published in January 2006 and compliance with the new regulations began on October 1, 2013. Under Stage 2 of the D/DBP Rule, the MCLs for TTHM and HAA5 remain 80 μg/L and 60 μg/L, respectively; however, compliance with the MCL is based on the running annual average of each individual sample site instead of the running annual average of all samples combined. The Cathlamet system falls into the category of systems serving between 500 and 9,999 people and must collect two samples each for TTHMs and HAA5s per year.

The Town performs D/DBP sampling at Eagle Point. Samples for TTHM and HAA5 taken between November 2019 and Febuary 2021 indicate HAA5 levels ranging 13.6 μg/L to 52.2 μg/L and TTHM levels ranging from 13.6 μg/L to 43.6 μg/L. All test results are below the respective MCLs.

Unregulated Contaminant Monitoring Rule

Under the 1996 amendments to the SDWA, EPA is required to publish a new list of no more than 30 unregulated contaminants every 5 years that may warrant regulation due to their potential health effects and occurrence. EPA requires water systems to sample and test for the unregulated contaminates and use the resulting data to determine if regulation is warranted. The next round of required sampling will be taken in 2023 to 2025.

Per- and Polyfluoroalkyl Substances

Per- and polyfluoroalkyl substances (PFAS) have become an increased concern for groundwater contamination in recent years. The substances are resistant to heat and chemical degradation and are used to manufacture heat-, grease-, oil-, stain-, and water-resistant materials. PFAS are commonly found in consumer goods such as clothing, nonstick cookware, and food packaging as well as fire retardants and surfactants. PFAS are typically found in groundwater near military bases, airports, and local fire departments.

The EPA established non-regulatory lifetime health advisory levels for two specific PFAS, perfluorooctanoic acid (PFOA) and perfluorooctanesulfonic acid (PFOS) at 70 parts per trillion combined. As of 2022, the EPA is still in the process of establishing federal drinking water standards for PFAS.

In Washington State, DOH's PFAS rule took effect in January 2022 and establishes State Action Levels (SAL) for five PFAS commonly found in drinking water. The rule will require water systems to monitor all active, permanent, and seasonal sources beginning in 2023 and no later than 2025. Monitoring requirements are set by WAC 246-290-300(10), and sampling will be required a minimum of once every 3 years. In the event PFAS is detected, follow up measures and monitoring will be required. The SALs for the five PFAS are summarized in Table 3-9. The Town of Cathlamet will begin sampling for PFAs by 2025.

TABLE 3-9

PFAS SALs

Chemical	State Action Level(1)
PFOA	10 µg/L
PFOS	15 µg/L
PFHxS	65 µg/L
PFNA	9 µg/L
PFBS	345 µg/L

(1) All action levels set by WAC 246-290-315(4).

Surface Water Treatment Rule (Long Term 1 and 2 Enhanced Rules)

The Long-Term 1 and 2 Enhanced Surface Water Treatment Rules (LT1ESWTR and LT2ESWTR) build upon the existing Surface Water Treatment Rule requirements. For systems using conventional filtration, the maximum turbidity allowed is 1 NTU with at least 95 percent of all combined filter effluent turbidity measurements below 0.3 NTU.

Under the Surface Water Treatment Rule, filtered water systems must meet certain removal criteria for *Giardia lamblia* and viruses. Purveyors are required under WAC 246-290-630 to provide 3-log (99.9 percent) removal of *Giardia lamblia* and 4-log removal (99.99 percent) removal of viruses. The removal is attained with a combination of filtration and disinfection. Disinfection is used in addition to filtration to provide additional *Giardia* and virus inactivation to comply with the requirements.

LT2ESWTR establishes treatment technique requirements for filtered systems based on their risk level for contamination, calculated from the system's average Cryptosporidium concentration. Additional requirements include up to 2.5-log Cryptosporidium treatment in addition to existing requirements under the IESWTR and LT1ESWTR. Filtered systems which demonstrate low levels of risk are not required to provide additional treatment. Unfiltered systems under this proposed rule must achieve at least a 2-log removal of Cryptosporidium if the source water is monitored for Cryptosporidium and its mean level remains below 0.01 oocysts/L. If an unfiltered system elects not to monitor, or the mean level of Cryptosporidium exceeds 0.01 oocysts/L, the LT2ESWTR requires the system to provide a minimum 3-log removal of Cryptosporidium. All unfiltered systems are required to utilize a minimum of two disinfectants in their treatment process.

The LT2ESWTR also addresses systems with unfinished water storage facilities. Under this rule, systems must either cover their storage facilities, provide at least a 4-log virus removal, or perform state-approved risk mitigation. Lastly, the rule extends the requirement of the disinfection profiles mandated under the LT1ESWTR to the Stage 2 D/DBPR.

The Town is currently in compliance with these treatment rules.

DESIGN STANDARDS

Performance and design criteria typically address the sizing and reliability requirements for source, storage, distribution, and fire flow. WAC 246-290 contains general criteria and standards that must be followed in development of public water systems. In addition, Washington State Department of Health (DOH) has published its June 2020 Revised *Water System Design Manual* that provides more specific guidance for water system design. The design standards for the following subjects are discussed in the order shown below:

- General Facility Standards

    1. Average and Peak Day Demand
    2. Peak Hour Demand
    3. Storage Requirements
    4. Fire Flow Rate and Duration
    5. Minimum System Pressure
    6. Minimum Pipe Sizes
    7. Backup Power Requirements
    8. Valve and Hydrant Spacing Recommended Standard
    9. Other System Policies

DOH relies on various publications, agencies and the utility itself to establish design criteria. The following gives a brief description of three of the most widely recognized performance and design standards.

- **<u>WAC 246-290, Group A Public Water Systems</u>, Washington State Board of Health (Last updated March, 2022).**
  This is the primary drinking water regulation utilized by the Washington State Department of Health (DOH) to assess capacity, water quality, and overall compliance with drinking water standards.

- **<u>Water System Design Manual (WSDM)</u>, Washington State Department of Health (DOH) (Revised June, 2020).**
  Significant revisions to the former DOH Sizing Guidelines have recently been adopted. These standards will serve as guidance for the preparation of plans and specifications for Group A public water systems in compliance with WAC 246-290.

Table 3-10 lists the DOH Water System Design Manual guidance and the Town of Cathlamet's policies with regards to each standard for general facility requirements.

TABLE 3-10

Water System General Facility Requirements

Standard	DOH Water System Design Manual (June 2020)	Town of Cathlamet Standard
Average Day and Maximum Day Demand	Average Day Demand (ERU_{ADD}) and Maximum Day Demand (ERU_{MDD}) should be determined from previous metered water use data. Recommended minimum ERU_{MDD} of 350 gpd/ERU if daily data is not available.	ERU_{ADD} = 138 gpd/ERU ERU_{MDD} = 335 gpd/ERU
Peak Hour Demand	Peak hour demand is determined using the following equation: $PHD = (ERU_{MDD}/1440)[(C)(N) + F] + 18$ C = Coefficient from DOH Table 5-1 N = Number of connections, ERUs F = Factor of range from Table 5-1	System wide peak hour demand was calculated using the DOH formula, which reduced to: PHD = 0.438 x N + 70
Source	Capacity must be sufficient to meet the ERU_{MDD}. It is recommended for reliability that the capacity is also sufficient to replenish fire suppression storage in 72 hours.	Same as DOH Water System Design Manual, Chapter 4.
Storage	The sum of: • Operational Storage (OS) • Equalizing Storage (ES) • Standby Storage (SB)* • Fire Suppression Storage (FSS) • Dead Storage (DS) *Standby storage and fire suppression storage may be nested if permitted by the local fire authority	Same as DOH Water System Design Manual, using the formulas provided in the manual, Chapter 7, Table 7-1. The Town allows for the nesting of fire flow storage.
Minimum System Pressure	The system should 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 ERU_{MDD}.	Same as DOH Water System Design Manual, Chapter 7, Table 7-1.

TABLE 3-10 – (continued)

Water System General Facility Requirements

Standard	DOH Water System Design Manual (June 2020)	Town of Cathlamet Standard
Fire Flow Standard	The minimum fire flow shall be determined by the local fire authority or WAC 246-293 for systems within a critical water supply service area (CWSSA).	Residential = 1,000gpm Commercial = 1,500gpm
Minimum Pipe Sizes	The diameter of a transmission line shall be determined by hydraulic analysis. The minimum size distribution system line shall not be less than 6 inches in diameter.	Same as DOH Water System Design Manual.
Reliability Recommendations	• Multiple pumps which can provide MDD when the largest pump is out of service • A factor of safety is applied to a well pumping test safe yield determination • With the largest source out of service, the remaining permanent and seasonal sources can provide a minimum of ADD for the water system • Permanent and seasonal source capacity is enough to supply MDD in a pumping period of 20 hours or less • Looping of distribution mains when feasible. • Backup power equipment for pump stations unless there are two independent public power sources • Provision of multiple storage tanks • Standby storage of at least 200 gallons per ERU • Pipeline velocities not >8 fps at PHD • Flushing velocities of at least 2.5 fps for all pipelines Internal and external corrosion protection for all lines	Same as DOH Water System Design Manual.
Valve and Hydrant Spacing	Sufficient valving should be placed to keep a minimum of customers out of service when water is turned off for maintenance or repair. As a general rule, valves on distribution mains of 12 inches and smaller should be located every 1,000 feet. Fire hydrants on lateral should be provided with their own auxiliary gate valve.	Same as DOH Water System Design Manual.

CONSTRUCTION STANDARDS

Construction standards set forth the actual materials and construction standards that contractors, developers, and the Town must follow when constructing water system facility improvements. The Town has adopted the Standard Plans for Road, Bridge and Municipal Construction dated October 1993, prepared by the Washington State Department of Transportation, as now or hereafter amended, also known as the "Standard Plans" manual, as a guide to municipal construction.

SYSTEM COMPONENT ANALYSIS

The following section evaluates the existing water system facilities. They are analyzed based on their capacity, physical conditions, and performance capabilities relative to existing and projected growth conditions.

SOURCE OF SUPPLY ANALYSIS

A detailed description of the Town's sources of supply was presented in Chapter 1. According to the Department of Health Group A Public Water Systems Waterworks Standards, source production capacity must be sufficient to supply peak day demands. Additionally, peak day and average daily demands must comply with the maximum instantaneous and maximum annual withdrawal limitations of associated water rights.

Raw Water Intake: Description and Condition

The raw water intake infiltration trench was installed in 1986 and consists of approximately 90 linear feet of 10-inch-high density polyethylene (HDPE) pipe that extends across the width of the Elochoman River. The original construction plans indicate there are 40 individual 1/4-inch holes per foot of perforated pipe. The perforated intake pipe was installed approximately 5 feet below the riverbed and backfilled with import screened gravel in a construction fabric envelope. The intake pipe terminates in a manhole on either side of the river. Infrequently, the primary intake pipe's flow is restricted by sediment during high turbidity events.

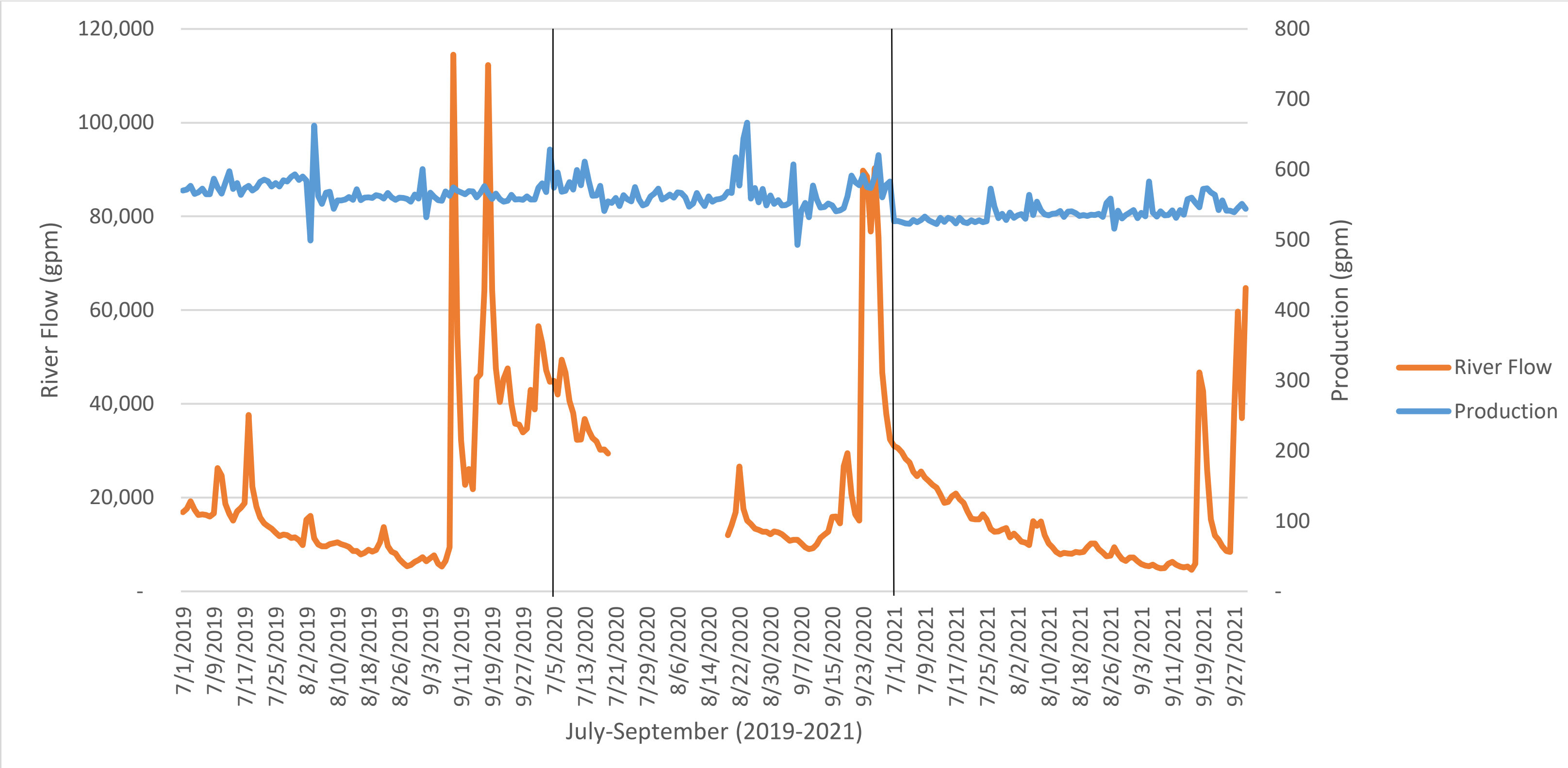
In 2016, a secondary surface water intake was installed on the Elochoman River adjacent to the infiltration trench. The surface water intake consists of a bullet nose screen and valve that connects to the raw water intake pipe.

The manhole located on the east side of the river is used to assist in cleaning the intake. The perforated pipe delivers the raw water to a 6-foot-diameter, 24.5-foot-deep, raw water manhole located inside the water treatment plant building where it is pumped for processing. The raw water pumps are vertical turbine pumps with motors mounted directly over the intake wet well. An access port for cleaning the perforated pipe is also located between the treatment plant building and the river.

The two raw water pumps are Floway Model 10JKM four stage line-shaft vertical turbine pumps, with 7.5-hp motors, which were installed in 2012, replacing the original pumps which were installed when the plant was constructed in 1999. Each raw water pump is rated for 350 gpm or 504,000 gallons per day (gpd), for a total instantaneous withdrawal rate of 700 gpm.

Figure 3-1 shows that over the last 3 years the plant was able to produce at least 500 gpm during summer months, when the river is at its lowest level. Per the operator, it is believed that the water treatment plant can currently produce at least 450 gpm during peak summer demands. This value will be used in capacity analysis to be conservative.

The limitation exists with the original water treatment plant river intake system in the Elochoman River that was constructed in 1986 and not replaced or improved when the water treatment plant was upgraded to its current 700 gpm (1,008,000 gpd) capacity in 1999. Improvements to the river intake system are needed to allow the raw water pumps to reliably pump at the filtration treatment system capacity of 700 gpm long term.



(1) River Flow data received from the Department of Ecology Freshwater Datastream (no data was found from July 20th through August 18th 2020).

FIGURE 3-1

Production vs. River Flow During Summer Months (2019-2021)

Water Rights Analysis

All appropriations of water for public use within Washington State must be made in accordance with existing water rights and the established procedures that govern their implementation and use. The Town's water rights are discussed in Chapter 1 and are summarized in Table 3-11. A water rights self-assessment is included in Appendix J.

TABLE 3-11

Town of Cathlamet Water Rights

Water Right Number	Points of Withdrawal	Priority Date	Certificate Date	Withdrawal Rate
Cert No. 10260	Elochoman River	February 4, 1941	Unknown	0.83 cfs 572.3 acre-feet(1)
Cert No. 3968B	Elochoman River	March 8, 1946	August 2, 1994	0.20 cfs(1)
Cert No. 3718B	Elochoman River	August 1, 1946	August 2, 1994	0.30 cfs(1)
Cert No. 2929(2)	Elochoman River	October 6, 1945	September 1, 2003(3)	0.50 cfs 61.5 acre-feet
782C	Abe Creek	March 27, 1928	Unknown	0.50 cfs(4)
40C	Cougar Creek	June 25, 1922	Unknown	0.60 cfs(4)
Total Permitted Withdrawal Rate from the Elochoman River (Instantaneous)				1.83 cfs (821 gpm)(5)
Maximum Annual Withdrawal from the Elochoman River				633.8 acre-feet
Maximum Withdrawal May 1 through September 30 each year				308.8 acre-feet(6)

(1) Total quantities diverted May 1 through September 30 each year under these certificates shall not exceed 247.3 acre-feet. Total annual quantities diverted under these certificates shall not exceed 572.3 acre-feet per year.

(2) Original certificate number, which was purchased by the Town of Cathlamet from Dale and Margaret Strueby.

(3) Development schedule project completion date given on the Department of Ecology Amended Permit dated December 28, 2001.

(4) Abe Creek and Cougar Creek are not tributary to the Elochoman River and water is not being diverted from either source for use by the Town. Although water rights were issued to Cathlamet allowing withdrawal from Cougar Creek and Abe Creek, it was reported in the Record or Examination (ROE) that Cathlamet has not used either diversion since the Elochoman River withdrawal was permitted.

(5) Includes the four certificates (0.83, 0.20, 0.30, and 0.50 cfs) but does not include Abe and Cougar Creeks.

(6) Includes the original maximum withdrawal rate of 247. 3 ac-ft/yr plus the newly acquired water right, which includes an annual withdrawal rate of 61.5 ac-ft/yr.

For the purposes of this analysis, only the Elochoman River water rights have been evaluated. The existing pumping capacity of the raw water pumps is approximately 700 gpm and the permitted withdrawal is 821 gpm.

Table 3-12 compares the maximum recorded pumping rate from the Town's source to the maximum instantaneous withdrawal allowed under the Town's existing water rights. As shown in Table 3-12, the Town does not draw any water from Abe or Cougar Creek. However, the Elochoman River intake has a surplus of 121 gpm. The Town recently installed two new pumps at the intake rated at 350 gpm each, raising the total pumping capacity from 600 gpm to 700 gpm.

TABLE 3-12

Historical Instantaneous Production Water Rights Analysis

Source (No.)	Maximum Recorded Pumping Capacity (gpm)	Maximum Instantaneous Withdrawal Allowed Under Existing Water Rights (gpm)	Surplus/ (Deficit) (gpm)
Abe Creek	0	224	224
Cougar Creek	0	269	269
Elochoman River	700[1]	821	121
Total		1,314	614

(1) Based on pumping capacity with both pumps running (350 gpm each).

In Table 3-13, the annual production for the Town's sources over the last 7 years of use are compared to the allowed average annual withdrawal designated by existing water rights. As shown in Table 3-13, the annual and seasonal production for the Town is in within the maximum withdrawal water rights.

TABLE 3-13

Historical Annual Production Water Rights Analysis[1]

Year	Elochoman River (Annual 633.8 ac-ft)		Elochoman River (May 1-Sept 30 308.8 ac-ft)	
	Annual Production (ac-ft)	Surplus (ac-ft)	Annual Production (ac-ft)	Surplus (ac-ft)
2015	325	309	166	142
2016	319	315	169	140
2017	345	288	180	129
2018	313	321	161	147
2019	296	338	146	163
2020	294	340	143	166
2021	361	273	194	115

(1) Annual production includes filter backwash.

Table 3-14 compares the projected average annual withdrawal requirement with existing water rights. As shown in Table 3-14, based on projected annual withdrawal requirements, the Town has adequate annual withdrawal water rights through the year 2043.

TABLE 3-14

Projected Average Annual Withdrawal Water Rights Analysis

Year	Projected Filter Backwash Volume(1) (acre-ft/yr)	Projected System Demand(2) (acre-ft/yr)	Projected Total Annual Withdrawal(3) (acre-ft/yr)	Max Annual Water Right (acre-ft/yr)	Water Rights Surplus (acre-ft/yr)
2022	42.57	287.9	330.5	633.8	303.3
2023	43.55	294.6	338.1	633.8	295.7
2024	44.56	301.4	345.9	633.8	287.9
2025	45.57	308.2	353.8	633.8	280.0
2026	46.60	315.2	361.8	633.8	272.0
2027	47.69	322.6	370.2	633.8	263.6
2028	48.76	329.8	378.6	633.8	255.2
2029	49.89	337.4	387.3	633.8	246.5
2030	51.05	345.3	396.3	633.8	237.5
2031	52.21	353.1	405.3	633.8	228.5
2032	53.43	361.4	414.9	633.8	218.9
2033	54.66	369.7	424.4	633.8	209.4
2034	55.93	378.3	434.3	633.8	199.5
2035	57.21	387.0	444.2	633.8	189.6
2036	58.52	395.8	454.3	633.8	179.5
2037	59.86	404.9	464.7	633.8	169.1
2038	61.25	414.3	475.5	633.8	158.3
2039	62.66	423.8	486.5	633.8	147.3
2040	64.10	433.5	497.6	633.8	136.2
2041	65.55	443.4	509.0	633.8	124.8
2042	67.06	453.6	520.7	633.8	113.1
2043	68.60	464.0	532.6	633.8	101.2

(1) Equal to Filtered Backwash from Table 2-16 converted into acre-ft/yr.
(2) Equal to Total Average Day Production from Table 2-16 converted into acre-ft/yr.
(3) Sum of filter backwash and system demand.

Table 3-15 shows the projected seasonal water right surplus/deficit for the Town's seasonal water right of 308.8 acre-feet maximum that can be withdrawn from the Elochoman river between May 1 and September 30. Summer production is estimated as a percentage of total projected production based on the average percentage of total production over the last 6 years (51 percent). As shown in Table 3-15, the Town has adequate seasonal water rights for the 20-year planning period if consumption continues as projected.

TABLE 3-15

Projected Seasonal Water Rights Status[(1)]

Year	Projected Withdrawal May 1-Sept 30 (acre-feet)	Seasonal Water Rights (acre-feet)	Seasonal Water Rights Surplus
2022	169.8	308.8	139.0
2023	173.7	308.8	135.1
2024	177.7	308.8	131.1
2025	181.7	308.8	127.1
2026	185.8	308.8	123.0
2027	190.2	308.8	118.6
2028	194.4	308.8	114.4
2029	198.9	308.8	109.9
2030	203.6	308.8	105.2
2031	208.2	308.8	100.6
2032	213.1	308.8	95.7
2033	218.0	308.8	90.8
2034	223.0	308.8	85.8
2035	228.1	308.8	80.7
2036	233.3	308.8	75.5
2037	238.7	308.8	70.1
2038	244.2	308.8	64.6
2039	249.8	308.8	59.0
2040	255.6	308.8	53.2
2041	261.4	308.8	47.4
2042	267.4	308.8	41.4
2043	273.5	308.8	35.3

(1) Withdrawal is calculated as 51 percent of total projected annual withdrawal from Table 3-13, and includes filter backwash water.

Source Production Capacity Analysis

Table 3-16 shows the range of flow and run times for the intake pumps, and the corresponding maximum day production capacity of the intake pumps for the year 2021. This table assumes each pump operates 20 hours per day, per the DOH reliability recommendations, and that the pumps are maintained to produce up to the maximum capacity. Table 3-16 also shows the maximum production based on the proven capacity of the intake. Currently the intake is limiting the capacity of the treatment plant.

TABLE 3-16

Maximum Day Source Production

Well	Maximum Pump Run Time	Maximum Day Pump Capacity (gpm)	Maximum Day Production Based on Pumps (gpd)	Maximum Day Intake Capacity (gpm)	Maximum Day Production Capacity Based on Intake (gpd)
Elochoman River Intake (SO1)	20 hrs	700(1)	840,000(2)	450	648,000(3)

(1) Capacity limited to 700 gpm based on pumping capacity with both pumps running.
(2) Maximum day production based on both raw water pumps operating for 20 hours.
(3) Based on information given by the Water Treatment Plant Operator, intake capacity is about 450 gpm for 24 hours during summer months.

Using Table 3-16 as a basis for pumping capacity, Table 3-17 compares the maximum day production capacity of the Town's only source to the projected maximum day production requirements through the year 2043 with no reduction in DSL.

TABLE 3-17

Source Production Capacity Analysis
No Reduction in Distribution System Leakage

Year	Maximum Day Production Capacity(1) (gpd)	Maximum Day Intake Capacity(1) (gpd)	Projected Maximum Day Production(2) (gpd)	Production Surplus/(Deficit) (Based on Raw Water Pumping Capacity)	Production Surplus/(Deficit) (Based on Intake Capacity)
2022	840,000	648,000	587,000	253,000	61,000
2023	840,000	648,000	600,500	239,500	47,500
2024	840,000	648,000	614,400	225,600	33,600
2025	840,000	648,000	628,400	211,600	19,600
2026	840,000	648,000	642,600	197,400	5,400
2027	840,000	648,000	657,600	182,400	(9,600)
2028	840,000	648,000	672,500	167,500	(24,500)
2029	840,000	648,000	688,000	152,000	(40,000)
2030	840,000	648,000	704,000	136,000	(56,000)
2031	840,000	648,000	720,000	120,000	(72,000)
2032	840,000	648,000	736,800	103,200	(88,800)
2033	840,000	648,000	753,800	86,200	(105,800)
2034	840,000	648,000	771,300	68,700	(123,300)
2035	840,000	648,000	788,900	51,100	(140,900)
2036	840,000	648,000	807,000	33,000	(159,000)
2037	840,000	648,000	825,500	14,500	(177,500)

TABLE 3-17 – (continued)

Source Production Capacity Analysis
No Reduction in Distribution System Leakage

Year	Maximum Day Production Capacity(1) (gpd)	Maximum Day Intake Capacity(1) (gpd)	Projected Maximum Day Production(2) (gpd)	Production Surplus/(Deficit) (Based on Raw Water Pumping Capacity)	Production Surplus/(Deficit) (Based on Intake Capacity)
2038	840,000	648,000	844,700	(4,700)	(196,700)
2039	840,000	648,000	864,000	(24,000)	(216,000)
2040	840,000	648,000	883,900	(43,900)	(235,900)
2041	840,000	648,000	904,000	(64,000)	(256,000)
2042	840,000	648,000	924,800	(84,800)	(276,800)
2043	840,000	648,000	946,100	(106,100)	(298,100)

(1) From Table 3-16.
(2) From Table 2-17 – assumes no reduction in distribution system leakage.

As shown in Table 3-17, the Town has adequate raw water pumping capacity to serve the projected maximum day demands of the system through 2037 based on the capacity of the pumps. However, the Town only has adequate intake capacity to serve the projected maximum day demands of the system through 2026 based on the limitations of the raw water intake structure. The Town is projected to have a capacity deficit due to the limited intake capacity in 2027.

The projected maximum day production shown in Table 3-17 is based on no reductions in distribution system leakage from the 2021 3-year rolling average of 20.7 percent. The Water Use Efficiency requirements instituted by DOH requires the Town to meet a DSL standard of 10 percent or to demonstrate significant attempts to reduce the three year rolling average to 10 percent through a Water Loss Control Action Plan in compliance with WAC 246-290-820(1)(b)(iv) and WAC 246-290-820(4). Chapter 4 details the WLCAP.

Table 3-18 compares the Town's production capacity assuming the reduced DSL shown in the table. As shown in Table 3-18, the raw water pumps have the capacity to handle the Town's projected maximum day production demands through 2040 assuming the pumps can run at 700 gpm for 20 hours. If the DSL can be reduced as shown in Table 3-18, the Town will have adequate intake capacity through 2028 based on the limitations of the intake structure.

TABLE 3-18

Source Production Capacity Analysis Meeting Distribution Leakage Standard of 10 Percent

Year	Maximum Day Production Capacity[1] (gpd)	Maximum Intake Capacity[1] (gpd)	Target Annual DSL (%)	Target Annual DSL (gpd)	Projected Maximum Day Production[2] (gpd)	Production Surplus/(Deficit) Based on Pumping Capacity (gpd)	Production Surplus/(Deficit) Based on Intake Capacity (gpd)
2022	840,000	648,000	20%	51,000	584,687	255,313	63,313
2023	840,000	648,000	18%	45,800	591,790	248,210	56,210
2024	840,000	648,000	15%	37,700	596,266	243,734	51,734
2025	840,000	648,000	12%	29,800	601,186	238,814	46,814
2026	840,000	648,000	10%	24,800	609,020	230,980	38,980
2027	840,000	648,000	10%	25,400	623,243	216,757	24,757
2028	840,000	648,000	10%	26,000	637,452	202,548	10,548
2029	840,000	648,000	10%	26,600	652,191	187,809	(4,191)
2030	840,000	648,000	10%	27,200	667,202	172,798	(19,202)
2031	840,000	648,000	10%	27,800	682,457	157,543	(34,457)
2032	840,000	648,000	10%	28,500	698,358	141,642	(50,358)
2033	840,000	648,000	10%	29,100	714,402	125,598	(66,402)
2034	840,000	648,000	10%	29,800	731,077	108,923	(83,077)
2035	840,000	648,000	10%	30,500	747,751	92,249	(99,751)
2036	840,000	648,000	10%	31,200	764,942	75,058	(116,942)
2037	840,000	648,000	10%	31,900	782,405	57,595	(134,405)
2038	840,000	648,000	10%	32,600	800,643	39,357	(152,643)
2039	840,000	648,000	10%	33,400	818,995	21,005	(170,995)
2040	840,000	648,000	10%	34,100	837,763	2,237	(189,763)
2041	840,000	648,000	10%	34,900	856,889	(16,889)	(208,889)
2042	840,000	648,000	10%	35,700	876,546	(36,546)	(228,546)
2043	840,000	648,000	10%	36,500	896,719	(56,719)	(248,719)

(1) From Table 3-16.
(2) From Table 2-17 – assumes DSL shown.

STORAGE ANALYSIS

The nominal volume of a water reservoir is generally taken as the amount of water the reservoir could hold if filled all the way to the top of the reservoir wall. However, practically speaking a reservoir cannot be filled to the top of the wall, and a reservoir also cannot, under normal operational conditions, be drained completely. Therefore, there is a need to determine how much of a reservoir volume is effective storage and how much effective storage a water system needs. The DOH Water System Design Manual identifies the following components of reservoir storage volume:

- Operational Storage
- Equalizing Storage
- Standby Storage
- Fire Suppression Storage
- Dead Storage

A reservoir's effective storage volume is the nominal volume less operational storage and dead storage. This volume must be large enough to accommodate the requirements for equalizing storage, standby storage and fire suppression storage.

Minimum System Pressure and Dead Storage

The effective storage capacity is that capacity of the reservoir that is reliably available in the reservoir and capable of being withdrawn from the reservoir at the rates and pressures required for the water use purposes. The two reservoirs have different overflow elevations. Neither reservoir has any "dead" storage. WAC 246-290-230(5) requires water systems to provide the peak hour flow at a pressure of 30 psi or higher when all equalizing storage is depleted.

Operational Storage (Vos)

Operational storage is the volume of water that flows in and out of a reservoir during normal system control cycling. Reservoirs typically operate with a maximum water level at which all source pumps are turned off, and a minimum level at which all source pumps are turned on. The amount of water that flows into and out of the reservoir between these two levels depends on the particulars of the operations control levels and the dimensions of the system reservoirs.

The Town operates its water system using its telemetry system. The pumps at the water treatment plant turn on and off based the water level in the Greenwood Reservoir. When the water level in the Greenwood Reservoir falls below 29.5 feet pumps at the water treatment plant turn on. The pumps turn off when the water level reaches 31.5 feet. When the level in the Kent's Ridge Reservoir drops below 22 feet pumps at the Greenwood Pump Station turn on to refill the tank. The pumps are set to turn off at 24 feet. The pumps are set to operate in a lag lead mode with the level differential of approximately 1 foot. Operational storage is therefore 31,770 gallons for the Greenwood Reservoir and 45,165 gallons for the Kent's Ridge Reservoir, yielding a total operational storage volume of 76,936 gallons for both reservoirs combined.

Equalizing Storage (Ves)

Equalizing storage is the amount of water needed to meet peak system demand for a period of time that the system demand exceeds the system source capacity. The DOH Water System Design Manual recommends that this volume be estimated as PHD minus source capacity for 150 minutes, but not less than zero.

Equalizing storage is calculated using the following equation:

$$V_{ES} = (Q_{PH} - Q_S)*(150 \text{ minutes})$$

Where:

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

Q_{PH} is the Peak Hour Demand from Table 2-17. Q_S is the raw water intake capacity of 450 gpm. Recommended equalizing storage capacities for years 2022 through 2043, based on the DOH Water System Design Manual, are shown in Table 3-19.

Standby Storage (Vsb)

Standby storage is water held in reserve for emergency situations, such as temporary loss of a water source. The DOH Water System Design Manual recommends that this volume be estimated as 2 days of average day demand for the water system, less the amount of water that can be produced by the water system in 1 day with the largest source of supply out of service, but not less than 200 gallons per ERU.

Standby storage is calculated using the following equation:

$$SB_{TMS} = (N)(SB_i)(T_d)$$

Where:

SB = Total standby storage component (gallons)
N = Number of ERUs based on the ERU_{MDD} value
SB_i = Locally adopted unit SB volume (gpd per ERU)
number of ERUs based on the ERU_{MDD} value
T_d = Number of days selected to meet water system-determined standard of . reliability (days)

Standby storage requirements will vary according to the number of ERUs for the given year. Since the Town of Cathlamet only has a single source and is prone to flooding or other extreme weather events, the locally adopted unit Standby Storage volume is given at 335 gpd per ERU and the number of days selected to meet water system-determined stand of reliability is assumed to be one day. Standby Storage in Cathlamet for 2022 is 625,310 gallons.

Fire Suppression Storage (Vff)

Fire suppression storage is provided to ensure that the volume of water required for fighting fires is available when necessary. Fire suppression storage also reduces the impact of firefighting on distribution system water pressure. The amount of water required for firefighting purposes is specified in terms of rate of flow in gallons per minute (gpm) and an associated duration. Fire flows must be provided at a residual water system pressure of at least 20 pounds per square inch (psi).

Fire suppression storage is calculated using the following equation:

$$Vff = (FF)(t_m)$$

Where:

Vff = Required fire suppression storage component (gallons)
NFF = Required fire flow rate, as specified by fire protection authority (gpm)
t_m = Duration of FF rate, as specified by fire protection authority (minutes)

The standby storage component or the fire suppression storage component, whichever volume is smaller, can be excluded from a water system's total storage requirement provided that such practice is not prohibited by: (1) a locally developed and adopted Coordinated Water System Plan; (2) local ordinance; or (3) the local fire protection authority or County Fire Marshal (reference WAC 246-290-235(4)). The Town's current policy is to allow nesting of these components.

The Town's maximum fire flow standard is 1,500 gpm for 2 hours. However, the Town has decided to provide fire suppression storage to supply 3,000 gpm for 3 hours resulting in a fire suppression storage volume of 540,000 gallons.

Table 3-19 compares the existing capacity of the Town's reservoirs with projected storage volume requirements. With nesting of standby and fire flow storage the Town requires a storage volume of 1,200,369 gallons using the two reservoirs together in 2043. As shown in Table 3-19 the Town has adequate storage capacity through 2036 when fire flow is nested.

TABLE 3-19

Storage Analysis Summary

Year	$Vos^{(1)}$	$Ves^{(2)}$	$Vsb^{(3)}$	$Vff^{(4)}$	Total Storage Required w/Nesting	Available Storage	Surplus w/Nesting
2022	76,936	50,243	625,310	540,000	752,489	1,030,000	277,511
2023	76,936	52,703	639,660	540,000	769,299	1,030,000	260,701
2024	76,936	55,247	654,496	540,000	786,679	1,030,000	243,321
2025	76,936	57,790	669,332	540,000	804,058	1,030,000	225,942
2026	76,936	60,375	684,411	540,000	821,723	1,030,000	208,277
2027	76,936	63,127	700,464	540,000	840,527	1,030,000	189,473
2028	76,936	65,837	716,273	540,000	859,046	1,030,000	170,954
2029	76,936	68,672	732,812	540,000	878,420	1,030,000	151,580
2030	76,936	71,591	749,837	540,000	898,364	1,030,000	131,636
2031	76,936	74,510	766,862	540,000	918,308	1,030,000	111,692
2032	76,936	77,595	784,860	540,000	939,391	1,030,000	90,609
2033	76,936	80,680	802,858	540,000	960,474	1,030,000	69,526
2034	76,936	83,891	821,586	540,000	982,412	1,030,000	47,588
2035	76,936	87,101	840,313	540,000	1,004,351	1,030,000	25,649
2036	76,936	90,395	859,527	540,000	1,026,859	1,030,000	3,141
2037	76,936	93,772	879,228	540,000	1,049,936	1,030,000	(19,936)
2038	76,936	97,275	899,658	540,000	1,073,869	1,030,000	(43,869)
2039	76,936	100,819	920,332	540,000	1,098,086	1,030,000	(68,086)
2040	76,936	104,446	941,491	540,000	1,122,874	1,030,000	(92,874)
2041	76,936	108,115	962,894	540,000	1,147,946	1,030,000	(117,946)
2042	76,936	111,909	985,027	540,000	1,173,873	1,030,000	(143,873)
2043	76,936	115,787	1,007,646	540,000	1,200,369	1,030,000	(170,369)

(1) Vos is based on 2 feet of operational storage in Greenwood Reservoir and 2 feet in Kent's Bridge.
(2) Ves is based on a peak hour demand as presented in Table 2-17.
(3) Vsb is based on the DOH formula.
(4) Vff is based on providing 3,000 gpm for 3 hours.

DISTRIBUTION SYSTEM HYDRAULIC 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.

General Description and Condition

The Town's water distribution system is described in general terms in Chapter 1. The majority of the Town of Cathlamet existing distribution system was installed in the 1960s and 1970s and consisted primarily of asbestos cement (AC) water main. During 1998, over 22,000 linear feet of 8-inch and 12-inch polyvinyl chloride (PVC) water main was installed. The new distribution lines increased fire flow transmission capacity to the entire service area. With the distribution improvements completed in 1998, the Town serves five pressure zones plus Puget Island. The Town of Cathlamet's distribution system consists of approximately 110,000 linear feet (20 miles) of 1-1/2-inch through 12-inch water mains. Figure 1-2 shows the layout of the distribution system. Figure 1-8 shows a pressure zone schematic of the entire Town of Cathlamet water system.

Life expectancy may vary widely depending on the type and quality of pipe, installation details, soil conditions, and water quality. It is not known how long the AC water mains in Cathlamet may last. However, it is generally better to replace old facilities before they fail, in order to prevent a crisis situation. An AC pipe replacement program is recommended in the capital improvement plan to continue to replace AC pipe within the system with longer lasting materials.

Hydraulic Modeling Software

The Town's water system was analyzed using Innovyze's InfoWater hydraulic modeling software, which operates in an ArcGIS. The InfoWater model was created from the Town's previous H2ONet model and updated based on the Town's water system base map.

The InfoWater model is configured with a graphical user interface. Each water system element, including pipes, valves, pumps, and reservoirs, is assigned a unique graphical representation within the model. Each element is assigned a number of attributes specific to its function in the actual water system. Typical element attributes include spatial coordinates, elevation, water demand, pipe lengths and diameters, and critical water levels for reservoirs. With attributes of each system element as the model input, the InfoWater software produces the model output in the form of flows and pressures throughout the simulated water system.

Model Assumptions

Prior to the calibration of the hydraulic model, the basic layout of the water system is recreated within the model. The lengths, diameters, and connection points of system piping are assigned using an updated base map of the water system. The locations of water mains and valves are found on water system base maps, while the critical elevations of the Town's reservoirs are obtained from available data. The assumptions regarding the modeling of the Town's water sources, and the system demands are included in the following sections.

System Demands

A key element in the hydraulic modeling process is the distribution of demands throughout the water system. Total demand on the system is based on the existing and projected demands from Chapter 2. Existing demands were distributed uniformly throughout the water system.

Seven demand sets were used in the hydraulic analysis.

- 2022 Average Daily Demands: These demands were used while calibrating the model.

- 2022 Peak Hour Demands: These demands were used to verify the system is able to meet the DOH standards to supply domestic water at a minimum system wide pressure of 30 psi.

- 2022 Maximum Day Demands: These demands were used to evaluate the system's ability to meet the maximum day demands plus required fire flows at DOH's required system pressure of 20 psi currently.

- 2033 Peak Hour Demands: These demands were used to verify the system is able to meet the DOH standards to supply domestic water at a minimum system wide pressure of 30 psi within the 6-year planning period.

- 2033 Maximum Day Demands: These demands were used to evaluate the system's ability to meet the maximum day demands plus required fire flows at DOH's required system pressure of 20 psi within the 6-year planning period.

- 2043 Peak Hour Demands: These demands were used to verify the system is able to meet the DOH standards to supply domestic water at a minimum system wide pressure of 30 psi within the 20-year planning period.

- 2043 Maximum Day Demands: These demands were used to evaluate the system's ability to meet the maximum day demands plus required fire flows at DOH's required system pressure of 20 psi within the 20-year planning period.

Model Calibration

The calibration of a hydraulic model provides a measure of assurance that the model is an accurate and realistic representation of the actual system. The hydraulic model of the Town's water system was calibrated in 2014 using data obtained from fire hydrant tests at various locations throughout the water system. Four fire hydrant tests were conducted with the assistance of Town personnel on July 23, 2014. During these tests, static and residual pressures were recorded as Town staff opened hydrants and recorded the flow rate. Field results were used to calibrate the hydraulic model through verification and adjustment of pipe type, sizes, roughness coefficients, and elevations.

Calibration of the hydraulic model produced results that were within 4 psi of actual field test data for static pressure. Modeled residual pressures were within 2 psi of measured field data. Since the model was converted from H2ONet to InfoWater elevations, pipe roughness coefficients, and pipe diameters are imported into the new model a new round hydrant tests is not necessary.

To verify the continued accuracy of the model, the Town has provided pressure readings from each PRV station which can be used to update settings in the model for each pressure zone. The following data was provided by the Town and verified in the model as shown in Table 3-20.

TABLE 3-20

PRV Model Settings

Name	Size	Elevation	Setting in Model
Boege PRV(1)	3 inch	241 ft	63 psi
	8 inch		58 psi
Cochran PRV	3 inch	430 ft	48 psi
	8 inch		43 psi
Columbia PRV(2)	1.5 inch	185 ft	33 psi
	4 inch		28 psi
Eagle Point PRV	1.5 inch	180 ft	33 psi
	4 inch		28 psi
Greenwood PRV	0.75 inch	240 ft	52 psi
	1.5 inch		47 psi
	4 inch		42 psi
Boege Road and SR4 PRV 1(3)	2 inch	230 ft	68 psi
	6 inch		63 psi
Boege Road and SR4 PRV 2(3)	2 inch	218	73 psi
	6 inch		68 psi

(1) Settings for the 10- and 20-year scenarios are 76 psi (3") and 71 psi (8") as part of a capital improvement project.
(2) Settings in the 10- and 20-year scenarios are 37 psi (1.5") and 32 psi (4").
(3) New PRV active in 10- and 20-year scenarios only.

During calibration of the model, some of the PRV settings were adjusted based on measurements from the water system superintendent, to more closely reflect the field results. The Columbia and Eagle Point PRV settings are very at or below the minimum DOH required service pressures for peak hour conditions. As a result, some of the nodes downstream of the Columbia PRV show pressures below 30 psi when using the current PRV settings. Modeling the system with the current PRV settings does not provide the most meaningful analysis of the physical and hydraulic capacity of the distribution system, since the PRV settings are easily adjustable. Therefore, the 10-year and 20-year hydraulic modeling has been completed with the PRV settings adjusted to 37 psi for the smaller valve, and 32 psi for the larger. By eliminating the pressure limitations created by the PRV settings, the model results provide a better depiction of deficiencies in the distribution system. The Town will adjust PRV settings accordingly to ensure adequate flow and pressure throughout the system, and this project is included as an operational improvement in the CIP chapter of this Plan.

The Town is also currently in the design phase for two new PRV stations near the intersection of Boege Road and SR 4, in order to create a new pressure zone. As a part of this project the Boege Road PRV settings will also be raised. The new pressure zone is included in the 10- and 20-year model scenarios.

Model Input

Model input assumptions have significant impacts on peak hour and fire flow results. Table 3-21 shows the levels of each reservoir during the three model scenarios. Based on the capacity analysis earlier in this chapter, the Town will have a storage deficit by 2037, so a new reservoir will need to be added to the system in the 10-20 year time frame. For the purposes of modeling this, a second reservoir identical to the existing Kent's Bridge Reservoir will be added to the model in the 20-year CIP scenarios as shown in Table 3-21.

TABLE 3-21

Reservoir Levels During Model Scenarios

	Greenwood Reservoir			Kent's Bridge Reservoir			Kent's Bridge Reservoir No. 2		
Year	2022	2033	2043	2022	2033	2043	2022	2033	2043
Reservoir Overflow Height (feet)	32	32	32	24	24	24	-	-	24
Peak Hour Scenario Height (feet)	28.7	27.9	28.8	20.7	19.9	20.8	-	-	20.8
Fire Flow Scenario Height (feet)	12.4	7.0	12.3	4.4	1.0	4.3	-	-	4.3

A select few capital improvement projects have been included in the future modeling scenarios because they are either scheduled to be constructed soon or are necessary to the functioning the model scenario. Table 3-22 describes the improvements which were included in the future modeling scenarios.

TABLE 3-22

Capital Improvements Included in Model Scenarios

Improvement	Description	Included in Model Scenario	
		2033 CIP	2043 CIP
2nd Street Water Main Replacement	Upgrade to 8-inch PVC from Una Avenue to the west end of 2nd Street	X	X
Columbia PRV Settings Adjustment	Increase PRV settings for Columbia PRV above 30 psi	X	X
Boege Road and SR 4 PRVs	Add two new PRVs at Boege Road and SR 4 intersection to create new pressure zone, and increase settings at existing Boege Road PRV to increase pressure in southeast end of system	X	X
School Fire Hydrant Line	Upgrade 6-inch line to the hydrant at the school to 8 inch or larger	X	X
Kent's Bridge Reservoir 2	Add a second reservoir at Kent's Bridge to increase storage capacity		X

Peak Hour Demand Modeling Results

According to WAC 246-290, a water system must maintain a minimum pressure of 30 psi in the distribution system under peak hour demand conditions. The Town's existing distribution system has been modeled under 2022, 2033, and 2043 peak hour demand conditions. Key results are shown in Table 3-23, system wide static pressures from these scenarios are presented in Appendix K.

TABLE 3-23

Peak Hour Low Pressures per Hydraulic Modeling

Node ID	Required Pressure	Pressure during Peak Hour Flow					Location
		2022	2033	2033 w/CIP	2043	2043 w/CIP	
J97	30	29.51	27.92	31.72	27.35	31.17	Just Downstream of Columbia PRV
J96	30	29.51	27.93	31.73	27.37	31.20	Just Downstream of Columbia PRV

(1) Results based on recommended adjustments to PRV settings in Table 3-20.

Overall, the system is capable of handling peak hour flows through 2043 with the proposed capital improvements implemented. As shown in Table 3-23, there are two nodes which show slight deficiencies in the peak hour demand scenarios in which no projects are included (J96 and J97). These nodes experience pressures just below 30 psi because they are located directly downstream of the Columbia Street PRV, which has a 4-inch and a 1.5-inch valve set at 28 psi and 33 psi, respectively. Results from the existing (2022) peak hour demand scenario are shown in Figure 3-2.

If the Town raises the 1.5-inch valve setting to be 30 psi, the pressure at those nodes would increase. This is an improvement that can be made quickly and at no cost to the Town. The Town should verify pressures and elevations at this location before adjusting the PRV settings.

Fire Flow Modeling Results

The DOH Water System Design Manual states that a water system should be designed to provide adequate fire flow under maximum day demand conditions, while maintaining a minimum pressure of 20 psi. All pumps and sources are turned off for fire flow scenarios to simulate emergency conditions. Table 3-24 provides available fire flow at all of the hydrants that do not meet the recommended minimum required flow in the Town. Deficiencies are shown in bolded text. According to the Fire Chief, commercial/industrial areas must be capable of providing 1,500 gpm, while residential areas must provide 1,000 gpm. While it is possible to provide greater than 1,000 gpm in a variety of locations outside the Town Limits, fire flow is considered an urban service and only required within the Town Limits. Therefore, fire flow availability was only analyzed in places where there are currently fire hydrants. Complete fire flow results are available in Appendix K.

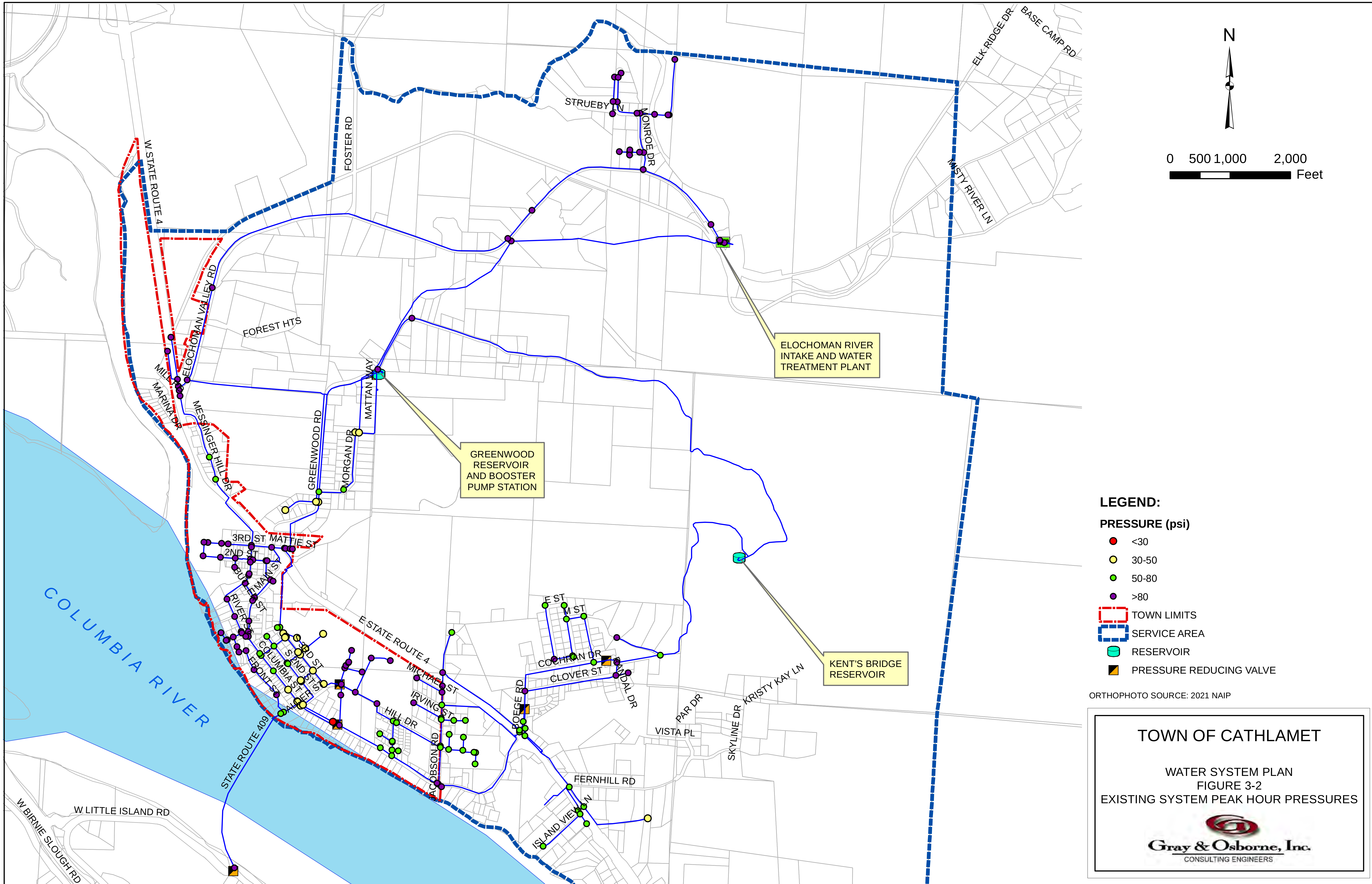
TABLE 3-24

Fire Flow Deficiencies per Hydraulic Modeling

Hydrant ID	Required Fire Flow (gpm)	Available Flow at Hydrant (gpm)					Location
		2022	2033	2033 w/CIP	2043	2043 w/CIP	
Residential							
J148	1,000	**851**	**834**	1,257	**529**	1,219	At the school, North of 3rd and Maple Street (6-inch main)
J36	1,000	1,058	1,026	1,044	**987**	1,061	Messinger Hill Dr
J189	1,000	1,025	**992**	1,013	**951**	1,030	Messinger Hill Dr
Industrial/Commercial							
J43	1,500	**1,201**	**1,189**	1,792	**1,175**	1,906	2nd Street (4-inch main)
J39	1,500	1,784	1,723	1,777	**1,442**	1,889	3rd Street (fixed by upgrading 2nd Street line)
J40	1,500	1,641	1,622	1,781	**1,443**	1,893	3rd Street (fixed by upgrading 2nd Street line)
J211	1,500	1,881	1,722	2,000	**1,442**	2,013	3rd Street (fixed by upgrading 2nd Street line)
J84	1,500	1,655	1,835	1,744	**1,484**	1,712	Front Street downtown
J85	1,500	1,564	1,562	1,690	**1,437**	1,648	Front Street downtown

As shown in Table 3-24, hydraulic modeling indicates that there are currently two hydrants in the distribution system within the Town limits which may be unable to supply the minimum required fire flow. Hydrant J148 is located near the school on a 6-inch diameter dead end water main. This main should be increased to 8-inch diameter to provide adequate fire flow to the school. Hydrant J43 is located on the 4-inch main on 2nd Street. A project to upsize this line to 8-inches has already been designed and is planned to be constructed within the next 2 years.

The number of hydrants showing fire flow deficiencies increases to nine as demands increase and reservoir level drop in the 10- and 20-year planning scenarios. Two hydrants on Messinger Hill Drive and two on Front Street are less than 100 gpm below their respective required fire flow. Both of these deficiencies are corrected by the adjusted PRV settings for Columbia and Eagle Point PRVs. Three hydrants on 3rd Street show deficiencies in the 20-year scenario, these are all corrected by the 2nd Street upgrade project which will be completed soon. All deficiencies are corrected by the proposed capital improvement projects. The 20-year planning fire flow availability without and with the proposed capital improvement projects are shown in Figures 3-3 and 3-4, respectively.

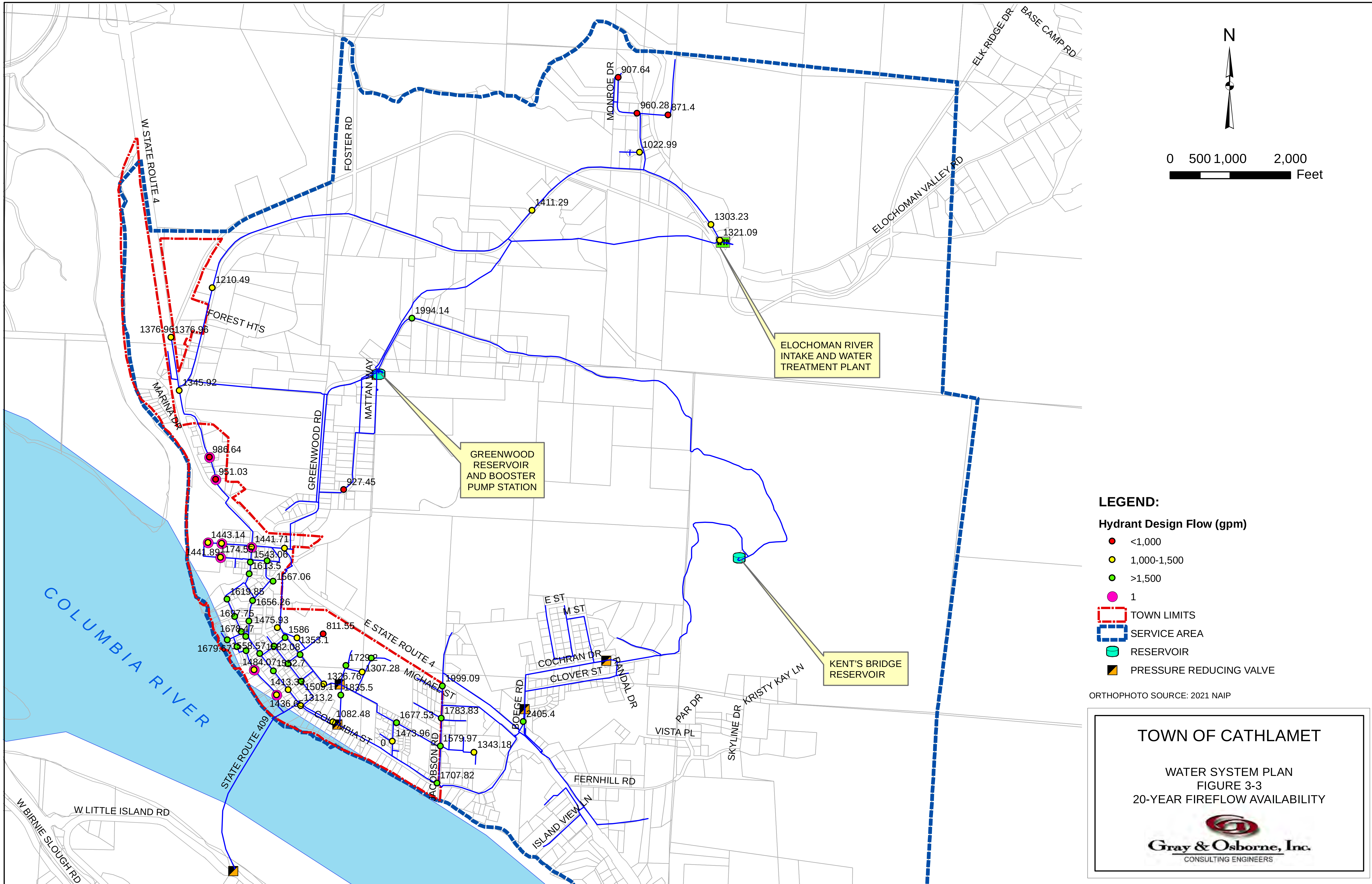


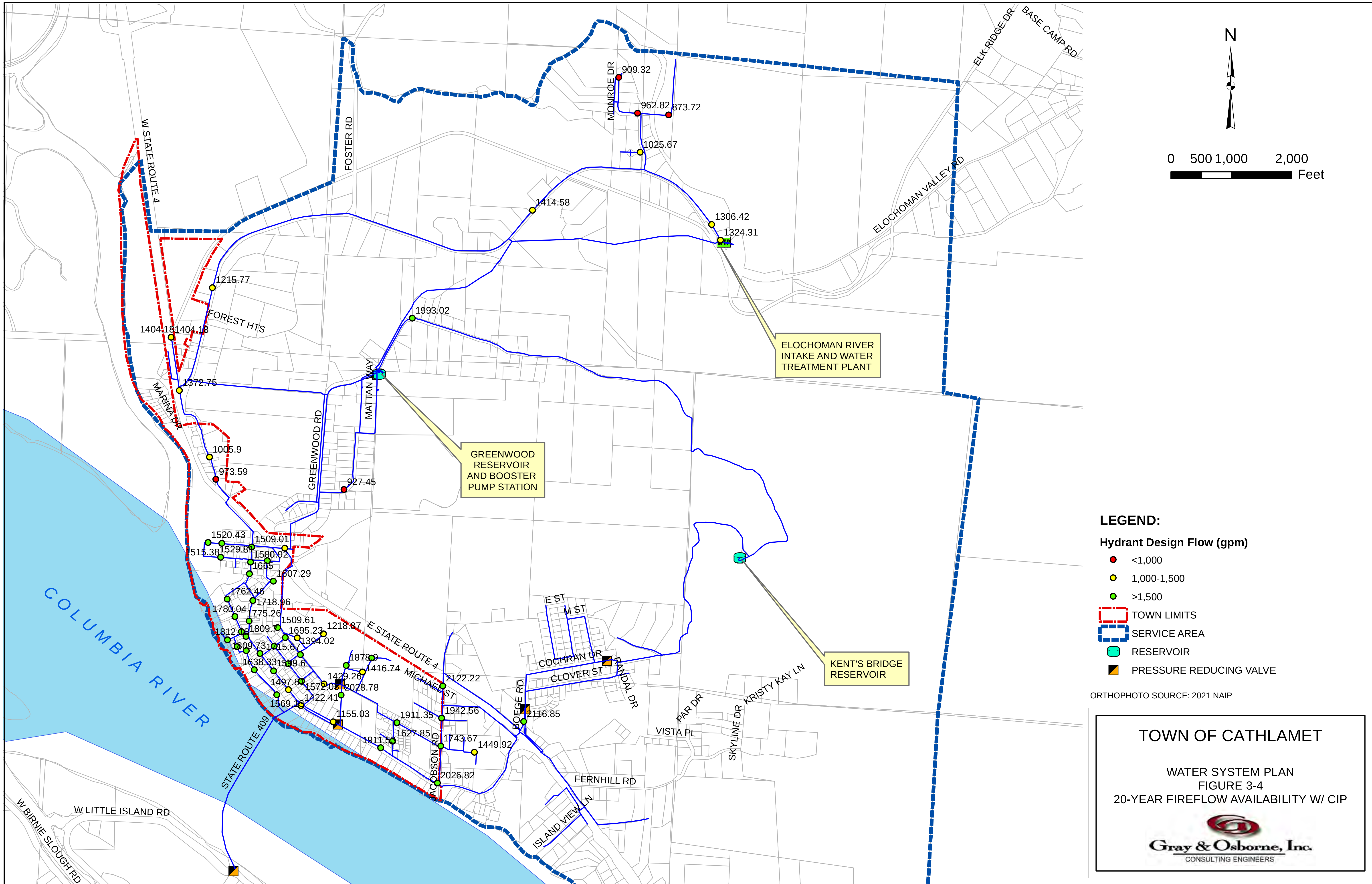
TOWN OF CATHLAMET

WATER SYSTEM PLAN
FIGURE 3-2
EXISTING SYSTEM PEAK HOUR PRESSURES

Gray & Osborne, Inc.
CONSULTING ENGINEERS

L:\Cathlamet\22229.00 Water System Plan Update\GIS\MXDs\Fig 3-1 Peak Hour Pressures.mxd


TOWN OF CATHLAMET
WATER SYSTEM PLAN
FIGURE 3-3
20-YEAR FIREFLOW AVAILABILITY
Gray & Osborne, Inc.
CONSULTING ENGINEERS
LEGEND:
Hydrant Design Flow (gpm)
<1,000
1,000-1,500
>1,500
1
TOWN LIMITS
SERVICE AREA
RESERVOIR
PRESSURE REDUCING VALVE
ORTHOPHOTO SOURCE: 2021 NAIP
N
0 500 1,000 2,000
Feet
ELOCHOMAN RIVER INTAKE AND WATER TREATMENT PLANT
GREENWOOD RESERVOIR AND BOOSTER PUMP STATION
KENT'S BRIDGE RESERVOIR
COLUMBIA RIVER
W STATE ROUTE 4
FOSTER RD
MONROE DR
ELK RIDGE DR
BASE CAMP RD
ELOCHOMAN VALLEY RD
FOREST HTS
MARINA DR
MATTAN WAY
GREENWOOD RD
E STATE ROUTE 4
MICHAEL ST
COLUMBIA ST
JACOBSON RD
BOEGE RD
E ST
M ST
COCHRAN DR
CLOVER ST
RANDAL DR
PAR DR
KRISTY KAY LN
SKYLINE DR
VISTA PL
FERNHILL RD
ISLAND VIEW LN
STATE ROUTE 409
W LITTLE ISLAND RD
W BIRNIE SLOUGH RD
907.64
960.28
871.4
1022.99
1411.29
1303.23
1321.09
1210.49
1994.14
1376.96
1376.96
1345.92
986.64
951.03
927.45
1443.14
1441.71
1441.89
1174.5
1543.06
1613.5
1567.06
1619.85
1656.26
1697.75
1475.93
1678.47
1586
1353.1
811.55
1679.67
1558.57
1682.08
1484.07
1552.7
1729.2
1307.28
1326.76
1413.3
1509.1
1835.5
1999.09
1313.2
1436.6
1082.48
1677.53
1783.83
2405.4
1473.96
0
1579.97
1343.18
1707.82



TOWN OF CATHLAMET

WATER SYSTEM PLAN
FIGURE 3-4
20-YEAR FIREFLOW AVAILABILITY W/ CIP

Gray & Osborne, Inc.
CONSULTING ENGINEERS

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Addressing Deficiencies

As shown in the previous section, without any improvements to the system, the available fire flow would decrease further with an increase in system demands. To correct these existing deficiencies while planning for anticipated growth requires local distribution improvements. After analyzing results from the initial modeling, improvements were made to the distribution system to improve flows to deficient areas in the system. Each project is listed in Table 3-25 and discussed in further detail in Chapter 8, Capital Improvement Plan (CIP).

TABLE 3-25

Proposed Distribution System Improvements

Distribution System Improvement Project	Description
Columbia PRV	Adjust the settings on the Columbia PRV to provide pressures above 30 psi just downstream.
Boege Road PRVs	Construction two new PRVs at the Boege Road and SR 4 intersection to create a new pressure zone and increase the setting of the existing Boege Road PRV to raise pressures in the southeast end of the system.
2nd Street	Replace an estimated 800 linear feet of 4-inch (AC) water main with 8-inch (PVC) water main along 2nd Street from the Marina at the end of 2nd Street to Una Avenue.
Maple Street	Replace an estimated 500 linear feet of 6-inch (AC) water main with 8-inch (PVC) water main from the corner of Maple Street and South 3rd Street to Wahkiakum Middle School.

The above projects eliminate all projected hydraulic deficiencies related to distribution capacity in the 10 and 20 year planning periods. Additional deficiencies may occur that are based on the physical condition of the water mains and other system facilities.

TOWN OF CATHLAMET SYSTEM DEFICIENCIES AND CAPACITY SUMMARY

Existing and future system deficiencies are discussed below and summarized in Table 3-26.

WATER SYSTEM CAPACITY LIMITS

There are several factors that could limit water system facility capacity, including source capacity, storage capacity, water rights, and distribution facility capacity. From Tables 3-16 through 3-18 it can be seen that the raw water pumps have the capacity to meet estimated maximum day demand with 20 hours of pumping through 2038. However, the intake facility capacity currently limits the capability of the source to 450 gpm, which is projected to be exceeded by 2027.

To calculate the ERU limit based on source capacity, existing installed source capacity is divided by the estimated maximum day water demand per ERU. The maximum day demand is 335 gpd per ERU. The annual water rights limit from Table 1-2 is 633.8 AF/Y and the Average Day Demand per ERU from Table 2-9 is 138 gpd. The summer water right limit from Table 1-2 is 308.8 AF/Y maximum withdrawal from May through September.

The water system capacity limits are summarized in Table 3-26. The most limiting factor is the capacity of the water treatment plant intake in the Elochoman River. Table 3-17 projects that the intake will become the limiting factor in 2027, with a calculated capacity at the raw water intake of 1,935 ERUs. The intake is severely limiting the system's capacity to serve maximum day demands.

Note that the existing 1,825 ERUs includes Cathlamet and Puget Island demands as well as DSL, assuming it remains unchanged at the current 3-year average of 20.7 percent. The need for additional capacity can be delayed by reducing DSL for the Town of Cathlamet and by promoting water conservation, however a long term solution is discussed in the Capital Improvement Plan in Chapter 8.

TABLE 3-26

Water System Capacity Limits

Limiting Factor	System Capacity (ERUs)	Currently Serving (ERUs)	Available ERUs	Projected Year Exceeded
Source (intake)	1,935	1,825	110	2027
Source (pumps)	2,509	1,825	683	2038
Treatment	3,011	1,825	1,185	Beyond 20 Years
Equalizing Storage	2,586	1,825	760	2038
Standby Storage	2,586	1,825	760	2038
Annual Water Rights	4,110	1,825	2,284	Beyond 20 Years
Summer Water Rights	4,809	1,825	2,983	Beyond 20 Years
Instantaneous Water Rights	2,942	1,825	1,117	2042

SUMMARY OF SYSTEM DEFICIENCIES

From the foregoing discussions, the following are the identified water system deficiencies. No attempt is made here to prioritize the deficiencies. Improvements to correct identified system deficiencies will be prioritized in Chapter 8, Capital Improvements.

WATER RIGHTS AND SOURCE OF SUPPLY

The Town has adequate water rights from its own source to meet current and projected average day, average annual, and seasonal demands, as shown in Tables 3-14 and 3-15. The Town as adequate pumping and filtration capacity at the Water Treatment Plant at current projected demand levels through 2038. However, the actually capacity of the raw water intake is currently limiting the system to 450 gpm. The projected maximum day demand is expected to exceed this capacity in 2027 if the intake is not improved to be able to sustain the capacity of the pumps, which total 700 gpm. The Town may be able to delay this deficiency by decreasing DSL or promoting water conservation; however, this would be a short-term fix, and it is suggested that the intake is still upgraded.

TREATMENT PLANT DEFICIENCIES

The drinking water treatment plant has a capacity of 700 gpm. A description of the treatment plant and its capacity can be found in Chapter 1 of this Plan. Table 1-3 shows the capacity of each treatment plant component. The treatment plant has adequate capacity for the 20-year planning period (based on 24 hours of pumping/filtration).

STORAGE DEFICIENCIES

The Town currently has adequate storage, with nesting of fire flow and standby storage, through projected demands for the year 2036, as shown in Table 3-19. Additional storage is needed in the 10 to 20-year planning period. A project is included in Chapter 8 to build a second reservoir at Kent's Bridge identical to the existing tank.

TELEMETRY AND CONTROL DEFICIENCIES

The existing water system telemetry and control system is in need of improvements to allow the operators to efficiently and effectively operate the system. The Town has expressed a desire to have a laptop on which they can access the water utility SCADA system to avoid having to drive out to the treatment plant to check alarms and levels. The town has also noted communications failures between the treatment plant and the reservoir levels, sometime causing overflows at the reservoirs.

WATER DISTRIBUTION SYSTEM DEFICIENCIES

The Town has identified a number of distribution improvements to correct its distribution system deficiencies. These improvements are outlined in Chapter 8, Capital Improvements.

The following are improvements from previous water system plans that have not been completed that the Town would like to keep on the CIP:

- Meter Improvements at the Intertie: The intertie between the Town of Cathlamet and the Puget Island Water System is metered on the north side of the Highway 405 bridge. The meter is above ground and unprotected. The Town would like to protect the intertie by enclosing the piping and meter in a locked vault. As a part of this project, the Town would also add a strainer upstream from the meter in order to protect the meter from damage by occasional debris flowing through the distribution system.

- Elochoman Valley Road: Replace an estimated 250 lineal feet of 6-inch water main with new 8-inch ductile iron (DI) water main at the intersection of Elochoman Valley Road and Elk Meadow Drive.

- Miscellaneous Valve Replacements: Install a total of four 8-inch resilient seat gate valves at select locations to better respond to operational maintenance or emergencies.

The following improvements need to be made within the 6-year planning period to address fire flow deficiencies as described in the hydraulic modeling section of this chapter:

- 2nd Street – Replace an estimated 800 linear feet of 4-inch (AC) water main with 8-inch (PVC) water main along 2nd Street from the Marina at the end of 2nd Street to Una Avenue. This project is currently in design and is scheduled to be constructed in 2024.

- Maple Street – Replace an estimated 500 linear feet of 6-inch (AC) water main with 8-inch (PVC) water main from the corner of Maple Street and South 3rd Street to the hydrant at the school.

Over the last 3 years, distribution system leakage has averaged approximately 20.7 percent. Reduction of distribution system leakage will increase the number of ERUs that can be served by the system as well as reduce pumping costs. Reduction of distribution system leakage is a high priority. Annual leak detection, leak repair, and routine service meter replacement are significant elements required to reduce distribution system leakage.

Currently, water mains and individual service meters are replaced as breakage problems occur. Failures are often determined by comparing the current water bill to the previous month's bill. If the meter readings are substantially higher or lower than the previous month and water usage has not significantly changed, the Town will check the meter and watch for obvious signs of leakage. If the problem persists and no leakage is found, then the meter is replaced.

In addition, the Town of Cathlamet has a number of future main extension projects that are anticipated to be developer projects to serve future growth. These projects are not planned within the 6-year planning period and are discussed in more detail in Chapter 8.

ASSET MANAGEMENT PLAN

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 Town 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 Town's major water system assets and relates these items to planned Capital Improvement Projects previously described in this chapter. This inventory is used to assess the adequacy of the Town's Capital Improvement Program to maintain current levels of service over the long term.

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 3-27. 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 3-27

Asset Condition Rating System

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

ASSET INVENTORY

The Town of Cathlamet's Asset Inventory is shown in Table 3-28. Assets in Table 3-28 are sorted from highest Criticality to lowest Criticality, and then (for assets with equivalent criticality) by Annualized Replacement Cost. The inventory includes all major components of the Town's water system.

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TABLE 3-28

Asset Inventory

No.	Item	Asset Description	Year Installed	Condition	Life Expectancy (Years)	Remaining Useful Life (Years)	Consequence of Failure (CoF)	Likelihood of Failure (LoF)	Criticallity of Failure (CoF*LoF)	Replacement Cost (2022 dollars)	Annualized Replacement Cost
1	Telemetry System	PLCs, Radios, Antennas, Computer	~1999	Poor	20	-4	5	3	15	$650,000	$32,500
2	Finished Water Pumps	Original to WTP	~1999	Good	30	6	4	3	12	$80,000	$2,667
3	Raw Water Intake	90 LF of perforated 10-inch HDPE	1986	Acceptable	50	13	5	2	10	$200,000	$4,000
4	Intake Pumps	Floway Model 10JKM four stage line-shaft vertical turbine pumps, with 7.5-hp motors	2012	Good	30	19	5	2	10	$70,000	$2,333
5	Secondary Surface Water Intake	Consists of a bullet nose screen and valve that connects to the raw water intake pipe	2016	Acceptable	50	43	4	2	8	$25,000	$500
6	Greenwood Reservoir BPS	Booster Pump Station within a CMU building	1998	Acceptable	40	15	3	2	6	$350,000	$8,750
7	Greenwood Reservoir PRV	Single Pressure Reducing Valve station	1998	Acceptable	50	25	3	2	6	$150,000	$3,000
8	Cochran Drive PRV	Single Pressure Reducing Valve station	1998	Acceptable	50	25	3	2	6	$150,000	$3,000
9	Boege Rd/SR4 PRVs	Two PRV stations on north and south side of SR4	2023	New	50	50	3	2	6	$295,000	$5,900
10	Columbia St PRV	Single Pressure Reducing Valve station	1998	Acceptable	50	25	3	2	6	$150,000	$3,000
11	Eagle Pt. (High School) PRV	Single Pressure Reducing Valve station	1998	Acceptable	50	25	3	2	6	$150,000	$3,000
12	Boege Rd PRV - Elochoman Millworks	Single Pressure Reducing Valve station	1998	Acceptable	50	25	3	2	6	$150,000	$3,000
13	Puget Island Intertie (Meter)	Intertie meter	Unknown	Acceptable	50	Unknown	3	2	6	$150,000	$3,000
14	Crista Vista Water System Intertie (Meter)	Intertie meter	2023	New	50	50	3	2	6	$2,000	$40
35	Post Chlorine Pumps	Two Stenner 85 MHP5 pumps	2021	Acceptable	10	8	3	2	6	$5,000	$500
15	Greenwood Reservoir	500,000-gallon welded steel tank	1967	Acceptable	75	19	4	1	4	$1,800,000	$24,000
16	Kent's Bridge Reservoir	530,000-gallon glass lined, bolted steel reservoir	1998	Acceptable	100	75	4	1	4	$1,900,000	$19,000
17	Metering Pumps for coagulant injection	Two Stenner 85 MHP5 pumps	2022	Acceptable	10	9	2	2	4	$5,000	$500
18	Polymer Pumps	Two Stenner 85 MHP5 pumps	2022	Acceptable	10	9	2	2	4	$5,000	$500
19	Pre Chlorine Pumps	Two Stenner 85 MHP5 pumps	2018	Acceptable	10	5	2	2	4	$5,000	$500
20	Fluoride Pumps	Two Stenner 85 MHP4 pumps	2018-2019	Acceptable	10	5-6	2	2	4	$5,000	$500
21	Filter Unit	USFilter, Trident 210A	~1999	Good	50	26	4	1	4	$1,000,000	$20,000
22	Chlorine Analyzer	Hach CL17	2014	Good	10	1	2	2	4	$5,000	$500
23	Emergency Generator	Cummins QSB7-G5 NR3, 480/277V Voltage Range	2023	New	50	50	3	1	3	$250,000	$5,000
25	Customers Water Meters	Ranges from 5/8" to 2"	Varies	Varies	20	Varies	1	3	3	$265,000	$13,250
26	Distribution System Piping	Ranges from 4" to 12", mainly 6"	Varies	Varies	60	Varies	1	1-3	1-3	$22,606,150	$376,769
27	Backwash Blowers	Allows for cleaning of the backwash filters	~1999	Good	20	-4	2	1	2	$50,000	$2,500
28	Backwash Settling Tank	100,000-gallon above ground tank	~1999	Acceptable	50	26	2	1	2	$200,000	$4,000
29	Finsihed Water Clearwell	12,400-gallon finished water pumping wet well	~1968	Good	50	-5	2	1	2	$150,000	$3,000
30	Upper Clearwell	55,000-gallon below grade concrete clearwell	~1999	Good	50	26	2	1	2	$150,000	$3,000
31	Finished Turbidimeter	Hach Low Range 1720E	2014	Acceptable	10	1	1	2	2	$5,000	$500
32	Influent Turbidimeter	Hach Surface Scatter 6	~2014	Acceptable	10	1	1	1	1	$10,000	$1,000
33	Influent Flow Meter	Siemans Sitrans FM Magflo	2014	Acceptable	20	11	1	1	1	$5,000	$250
34	Streaming Current	Chemtrac SCM2500 (located under filters)	~2014	Acceptable	10	1	1	1	1	$10,000	$1,000
35	Static Mixer	TAH 3-Stage Process Mixer	~1999	Status unknown	30	6	1	1	1	$4,000	$133
36	Tank Sediment Remover	Scavenger Model PLR by Aqua Products, Inc	~1999	Never been used	20	-4	1	1	1	$50,000	$2,500
Total										**$31,057,150**	**$553,593**

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 Town of Cathlamet, evaluate past conservation efforts, and describe Cathlamet's water use efficiency plan for the next 6 years.

WATER USE EFFICIENCY PLANNING REQUIREMENTS

In 1989, the Washington Legislature passed the Water Use Efficiency Act (43.20.230 RCW), which directed DOH to develop procedures and guidelines relating to water use efficiency. In response to this mandate, Ecology, the Washington Water Utilities Council, and DOH jointly published a document titled *Conservation Planning Requirements* (1994).

In 2003, the Municipal Water Supply - Efficiency Requirements Act (Municipal Water Law) was passed. This legislation amended RCW 90.46 to require additional conservation measures and the Municipal Water law directed DOH to develop the Water Use Efficiency Rule (WUE Rule), which was adopted in January 2007. In addition, DOH has developed a WUE Rule guidance document, titled, "Water Use Efficiency Guidebook" (WUE Guidebook), which was updated January 2017 (DOH Publication No. 331-375). and superseded and replaced the 1994 Conservation Planning Requirements. The WUE Rule and the WUE Guidebook now provide all the currently effective water use efficiency planning requirements.

WATER USE EFFICIENCY RULE

The WUE Rule consists of a series of amendments to existing sections and addition of new sections to WAC 246-290, the Group A Public Water System Regulations, and sets additional requirements for public water purveyors. The WUE Rule is comprised of four sections:

- Planning requirements
- Distribution leakage standard
- Customer goal setting
- Annual WUE Reporting

The WUE Guidebook is intended to provide guidance and clarification on the requirements of the WUE Rule, and not to establish any additional requirements. The requirements of the WUE Rule are discussed in the following sections.

PLANNING REQUIREMENTS

The Planning Requirements of the WUE Rule include the following:

- Estimation of the amount of water saved through implementation of the system's WUE program over the past 6 years.
- Description the water system's WUE goals.
- Select WUE measures.
- For each WUE measure selected, either
  - Include a plan to implement the measure, or
  - Evaluate selected water use efficiency measures to show that they are not cost effective.

These WUE Rule planning requirements are addressed in the following sections:

ESTIMATION OF WATER SAVED

The ERU value has decreased from the last planning period (2011-2014) when it averaged 175 gpd/ERU to this plan (2015-2021) having an average of 132 gpd/ERU. The reduction in water use rate may be due to several influences, including water rates and regular promotion of water conservation by Cathlamet.

The overall change in residential water use rate from 175 to 132 gallons per ERU per day over the data period indicates an overall use rate reduction of 43 gallons per ERU per day, which is 15,695 gallons per ERU per year. At the 2021 estimated 1,446 ERUs from Table 2-10, this represents water savings of approximately 22.7 million gallons per year.

The overall change in DSL dropped from the 2014 3-year rolling average of 21.3 percent to the 2020 3-year rolling average of 17.7 percent. This decrease shows that Cathlamet is consistently moving towards the DSL goal of 10 percent. The year 2021 is not included in this discussion because there was a significant pipe leak that contributed to the majority of the DSL for that year. The 3.8 percent drop represents nearly 4 million gallons saved.

WATER USE EFFICIENCY GOALS

The WUE Rule requires that water use efficiency goals must be set in a public forum that provides opportunity for consumers and the public to participate and comment on the goals.

The Town set goals in the 2015 Plan to reduce the amount of distribution system leakage to meet WUE requirements of less than 10 percent and to promote conservation by its customers to reduce overall water demand. The Town has made progress toward both these goals in the last 6 years. However, the Town did not reach 10 percent DSL and will continue to keep this as their supply-side goal. The Town's current Water Use Efficiency Program demand-side goal was adopted in July 2010, and is to "Reduce average per capita residential consumption by two percent over the next 6 years by increasing customer awareness of water conservation measures through a program of public education, and improved customer leak detection capability provided by the new meters."

As the water system continues to grow it is anticipated that water use efficiency will continue to improve. This is due to plans to improve the water distribution system, improvements in water system control, and further measures to promote conservation. Also new home construction practices can result in a decline in the average ERU value because current building codes require the installation of higher efficiency plumbing fixtures that result in lower water consumption. The Following are proposed Water Use Efficiency goals for the 2023 to 2029 time period:

- Goal 1: Reduce the amount of DSL to a 3-year rolling average of less than 10 percent by 2028.
- Goal 2: Reduce average per capita residential consumption by 2 percent over the next 10 years.

SELECTED WATER USE EFFICIENCY MEASURES

The WUE Rule requires that water systems with between 500 and 999 service connections must implement or evaluate a minimum of four water use efficiency measures. The WUE Guidebook further states that water use efficiency measures that are required in other portions of the WUE Rule cannot be counted as measures to be selected under this requirement. Measures required in other portions of the WUE Rule include the following:

- Installation of source and service meters if meters are not already present;
- Regular calibration of meters;
- Development and implementation of a water loss control program if unaccounted-for water exceeds 10 percent;
- Education of consumers about water use efficiency practices; and
- Evaluation of rates that encourage water demand efficiency.

Measures that the WUE Guidebook suggests that can count toward satisfying the required number of water use efficiency measures include the following:

- Implementation of a conservation rate structure;
- Implementation of a water reclamation program;
- Customer assistance in repair of leaks in customer service lines and in homes;
- Additional consumer education, such as student education and consumer education at fairs; and
- Implementation of measures by customer class count as separate measures for each customer class for which it is implemented.

Conservation Rate Structure

The Town currently has rate structure that includes a fixed service charge with a per-unit charge as water consumption increases. The per-unit charge does not increase with increased water use; therefore, the rate structure is not considered an increasing block rate. The current rate structure does promote conservation by charging more for increased water use but is does not currently count as a water use efficiency measure since it is not an inclining block rate. The Town has seven customer classes, if the Town modified the rate structure to an inclining block rate, the Town would add seven new conservation measures. The Town's current rates can be found in Appendix F.

Customer Assistance in Repair of Leaks in Customer Service Lines and in Homes

The utility will notify customers of possible leaks on the residential side of the meter when a customer's usage changes by more than 10 percent from the previous month. The utility will explore the possibility of offering a billing adjustment when the customer provides proof of repair to the billing department.

The Town will continue to implement all their current measures described in the preceding sections as part of their Water Use Efficiency Program. Many of the measures selected for continued implementation require little funding. The Town will track finances associated with each measure and compare it to water saved to evaluate the effectiveness of each measure. If measures do not provide enough savings to meet their goals, additional measures will be considered.

IMPLEMENTATION/EVALUATION OF WATER USE EFFICIENCY MEASURES

Customer assistance in repair of leaks in customer service lines and in homes will include all seven customer classes. Therefore, the Town is implementing 7 WUE Measures. Since the minimum number of conservation measures is being implemented, no evaluation of the cost effectiveness of customer assistance in repair of leaks is required.

METERING REQUIREMENTS

The WUE Rule required all sources and customer service connections be metered by the year 2016. Cathlamet currently meters all sources, and all customers, and implements a water meter replacement program to assure meter accuracy. Therefore, no further action is required to comply with this requirement. The Town is currently switching over to ultrasonic meters and Advanced Metering Infrastructure (AMI), which will allow Cathlamet to collect real time data once they have enough meters installed to justify putting up the collector tower.

DISTRIBUTION SYSTEM LEAKAGE STANDARD

The WUE Rule set a DSL standard of 10 percent or less of finished water production based on a 3-year rolling average. Distribution system leakage is defined as the sum of all water metered into the distribution system over a given time period, less the sum of all metered water uses, and known or credibly estimated unmetered uses, out of the distribution system over the same time period. Known or credibly estimated unmetered uses may include uses such as construction, firefighting, water main flushing, and estimated leakage from leaks that have been repaired.

The three-year rolling average distribution system leakage for Cathlamet was 20.7 percent in 2021. This leakage rate exceeds the minimum requirement under the WUE Rule and therefore the Town must implement a water loss control action plan (WAC 246-290-820(1)(b)(iv) and (4)).

The Town of Cathlamet has compiled this Water Loss Control Action Plan (WLCAP) as part of a water use efficiency program under WAC 246-290-810 since the system's Distribution System Leakage (DSL) exceeds 10 percent. The following items are included in the WLCAP:

(a) The control methods necessary to achieve compliance with the distribution system leakage standard;

The Town is required to reduce DSL to below ten percent, which equates to an overall reduction of approximately 10.7 percent from the last 3-year rolling average of 20.7 percent. The methods that the Town will utilize to reduce DSL to achieve compliance with DOH standards include replacing *leaking pipes as they are discovered through the system's budgeted leak detection program every 3 years. In addition, the Town will continue replacing undersized pipes within its distribution system.*

Much of the Town's distribution system leakage (DSL) is likely a result of aging pipelines. While this DSL is currently higher than 10 percent, the Town has been making quantifiable improvements in reducing DSL. The most recent data demonstrates a DSL reduction of more than 7 percent between 2017 and 2020. In 2021 the Town found and fixed a large leak which contributed to a significantly higher DSL rate in the 2021 data, but is not indicative of the typical water loss.

The Town will be proactive in investigating sources for this high DSL by conducting system wide leak detection every 3 years. This will help to pinpoint major leaks in the system. At this time it is very difficult for the Town to identify where leaks are occurring unless there are visible signs at ground level. Leak detection will solve this problem.

All customers receiving water must be metered in order to maintain an accurate accounting of water used by the system. If this water is used and not metered, it is categorized as DSL. All accounts served by the Town are currently metered. The Town's biggest concern is metering hydrant use and construction water, as this is the most likely water to go unaccounted for.

(b) An implementation schedule;

Water mains scheduled for replacement in the next 20 years are listed in Chapter 8 of this Plan. Leak detection and repair is scheduled to occur every three years through the 10- and 20-year planning periods.

(c) A budget that demonstrates how the control methods will be funded;

A proposed budget is included in Chapter 9 of this Plan, which shows all water main replacements will be installed utilizing the water system's rates, reserves, and select funding programs to finance construction. Rate increases will be implemented in the coming years so that water main replacement can be continued.

In addition, the Town has budgeted $10,000 every 3 years for its leak detection program.

(d) Any technical or economic concerns which may affect the system's ability to implement a program or comply with the standard including past efforts and investments to minimize leakage;

With a system of this age and size, a distribution system leakage much less than 10 percent may be difficult. The Town will continue to reassess its program to lower its distribution system leakage until low levels of DSL are attained. The Town will need to continue to raise water rates to pay for capital improvements.

(e) If the average distribution system leakage calculated under subsection (2) of this section is greater than ten and less than twenty percent of total water produced and purchased, the water loss control action plan must assess data accuracy and data collection.

The Town's three year rolling average DSL is greater than 20 percent.

(f) If the average distribution system leakage calculated under subsection (2) of this section is between 20 and 29 percent of total water produced and purchased, the water loss control action plan must include elements listed under (e) of this subsection and implementation of field activities such as actively repairing leaks or maintaining meters within twelve months of determining standard exceedance.

The Town actively repairs leaks as soon as they are discovered. Over the next 12 months, the Town will perform a system wide leak detection survey and repair any leaks discovered as a result of the survey. In addition, as discussed above, water meters will be checked if they appear to be functioning incorrectly and the meter will be replaced. The Town is currently replacing meters with new ultrasonic AMI capable meters as they come up. Once a significant enough number of meters have been replaced with the AMI technology, collectors tower(s) will be installed which will collect data continuously and automatically.

(g) If the average distribution system leakage calculated under subsection (2) of this section is at thirty percent or above the total water produced and purchased, the water loss control action plan must include elements listed under (e) and (f) of this subsection (which are discussed below) and include implementation of additional control methods to reduce leakage within six months of determining standard exceedance.

The Town's DSL is under 30 percent.

GOAL SETTING AND PERFORMANCE REPORTING

Pursuant to the WUE Rule, Cathlamet must set water use efficiency goals and report progress annually. Cathlamet's water use efficiency goals have been addressed in preceding sections of this chapter. The annual report must include the following:

- Total source production.
- Total customer consumption.
- Progress made toward achieving your water savings goals for the year.

The WUE Rule requires that water conservation goals must include a measurable outcome, address water supply or demand characteristics, and include an implementation schedule. The goal setting process must be held through a public forum and be re-evaluated every 10 years. Annual reports must be available to the public and submitted to customers and DOH by July first.

The Cathlamet water use efficiency goals have been established through a public review and comment process as part of public review and comment process of this Plan. The Cathlamet Town Council has fully reviewed the water use efficiency goals contained in this Plan, provided opportunity for public review, comment and input, and has given due consideration to all public comment and input in the development of these goals.

WATER USE DATA REPORTING

The *Conservation Planning Requirements* identified several categories of water use data that must be collected and recorded. This data is needed to meet the planning and performance reporting requirements and check compliance with the distribution system leakage standard of the WUE Rule. Table 4-1 summarizes the water use data collection requirements.

TABLE 4-1

Summary of Water Use Data Collection

Data Type	Unit of Measure	Collection Frequency	Comments
Water Service Connections	Number	Annual	Track by customer class
Source of Supply Meter Readings	Gallons	Daily	Production data is collected at the treatment plant daily and reported to DOH on a monthly basis
Import/Export from Emergency Interties	Gallons	Daily	The Town of Cathlamet interties with the Wahkiakum PUD
Wholesale Water Sold	Gallons	Daily	The Town of Cathlamet wholesales water to the Wahkiakum PUD for the Puget Island Water System
Wholesale Water Purchased	N/A	N/A	The Town of Cathlamet has no wholesale source
Maximum Day	Gallons	Monthly	Maximum day is determined monthly from source of supply meter readings.
Maximum Month	Gallons	Annual	Maximum month is determined annually from the monthly production reports.
Accounted for Water	Gallons	Monthly	The sum of metered water sales, known unmetered water use (e.g., filling a 5,000-gallon water truck), and estimated unmetered water use (e.g., main flushing).
Distribution System Leakage	Gallons and Percent of Production	Annual	The difference between annual production and annual accounted-for water.
Residential Service Meter Readings	Gallons	Monthly	Total water use by customer class for each billing period.
Industrial/Commercial Service Meter Readings	Gallons	Monthly	
Population Served	Number of People	Update Annually	Service area population estimated from 2020 census and active connections at 2.4 people per connection.
Economic Data	Dollars	Annual	Review high, low and average water bills and assure adequate utility revenues.
Conservation Data	Gallons per capita per day	Annual	Track per-capita water use trends.

WATER USE EFFICIENCY PROGRAM DEVELOPMENT AND LEVEL OF IMPLEMENTATION

The following sections describe the Town of Cathlamet's water use efficiency goals, a description of the conservation measures, and the resulting water use projections.

TARGET WATER SAVINGS PROJECTIONS

Per capita water use history is summarized in Table 4-2. This table is based only on residential consumption in Cathlamet, inside and outside the Town limits but not including the intertie with Puget Island. Residential consumption per capita ranged from 53 to 56 gallons per capita per day (gpcd) with an average of 55 gpcd, as shown below.

TABLE 4-2

Average Annual per Capita Water Consumption

Year	Cathlamet Residential Consumption (gpd)	Residential Population		Average Per Capita Residential Use (gpcd)
		In Town	Out of Town(1)	
2018	70,036	490	751	56
2019	72,370	520	804	55
2020	75,395	560	871	53
2021	79,708	560	884	55
Average				**55**

(1) Estimated population based on number of connections.

The water use efficiency program sets an annual conservation goal of 2 percent reduction in per capita residential use in the next 6 years. This goal is appropriate for the Town because it is ambitious enough to result in noticeable water savings and is realistic enough to attain.

Table 4-3 shows the Town's water use projections as derived in Chapter 2, with the goals of reducing residential per capita consumption by two percent over the next 10 years and reducing the amount of DSL to a 3-year rolling average of less than 10 percent by 2028.

TABLE 4-3

Water System Demand Forecasting with WUE Goals Achieved

Year	Projected Total Residential Population[(1)]	Per Capita Residential Water Use Without Conservation (gpcd)[(2)]	Average Day Residential Consumption Without Conservation (gpd)[(3)]	Per Capita Residential Water Use With 2 Percent Conservation (gpcd)[(4)]	Average Day Residential Consumption With 2 Percent Conservation (gpd)[(5)]	Reduction of Average Day Residential Consumption (gpd)[(6)]	Average Day Production without Conservation (20.7% DSL) (gpd)[(7)]	Average Day Production w/Reduced DSL and 2 Percent Annual Conservation (gpd)[(8)]	Reduction of Average Day Production (gpd)[(9)]
2022	1,477	55.2	81,544	55.2	81,544	0	102,829	102,829	-
2023	1,511	55.2	83,421	55.1	83,254	167	105,197	100,306	4,891
2024	1,546	55.2	85,342	55.0	85,000	341	107,619	98,838	8,781
2025	1,581	55.2	87,307	54.9	86,783	524	110,097	96,425	13,671
2026	1,618	55.2	89,317	54.8	88,602	715	112,632	98,447	14,185
2027	1,655	55.2	91,373	54.7	90,460	914	115,225	100,511	14,714
2028	1,693	55.2	93,477	54.6	92,356	1,122	117,878	102,617	15,261
2029	1,732	55.2	95,630	54.4	94,291	1,339	120,592	104,768	15,825
2030	1,772	55.2	97,831	54.3	96,266	1,565	123,369	106,962	16,406
2031	1,813	55.2	100,084	54.2	98,282	1,802	126,209	109,203	17,007
2032	1,854	55.2	102,388	54.1	100,341	2,048	129,115	111,490	17,626
2033	1,897	55.2	104,746	54.1	102,651	2,095	132,088	114,057	18,031
2034	1,941	55.2	107,158	54.1	105,014	2,143	135,129	116,683	18,447
2035	1,985	55.2	109,625	54.1	107,432	2,192	138,241	119,369	18,871
2036	2,031	55.2	112,149	54.1	109,906	2,243	141,424	122,118	19,306
2037	2,078	55.2	114,731	54.1	112,436	2,295	144,680	124,929	19,750
2038	2,126	55.2	117,373	54.1	115,025	2,347	148,011	127,806	20,205
2039	2,175	55.2	120,075	54.1	117,674	2,402	151,419	130,748	20,670
2040	2,225	55.2	122,840	54.1	120,383	2,457	154,905	133,759	21,146

TABLE 4-3 – (continued)

Water System Demand Forecasting with WUE Goals Achieved

Year	Projected Total Residential Population(1)	Per Capita Residential Water Use Without Conservation (gpcd)(2)	Average Day Residential Consumption Without Conservation (gpd)(3)	Per Capita Residential Water Use With 2 Percent Conservation (gpcd)(4)	Average Day Residential Consumption With 2 Percent Conservation (gpd)(5)	Reduction of Average Day Residential Consumption (gpd)(6)	Average Day Production without Conservation (20.7% DSL) (gpd)(7)	Average Day Production w/Reduced DSL and 2 Percent Annual Conservation (gpd)(8)	Reduction of Average Day Production (gpd)(9)
2041	2,276	55.2	125,668	54.1	123,155	2,513	158,472	136,839	21,633
2042	2,328	55.2	128,562	54.1	125,990	2,571	162,121	139,989	22,131
2043	2,382	55.2	131,522	54.1	128,891	2,630	165,853	143,213	22,641

(1) Projected population is from Table 2-14, equal to Cathlamet residential population plus outside town limits population, does not include Puget Island.
(2) Per capita water use without conservation is from Table 4-2.
(3) Average day consumption without conservation is projected population times per capita water use without conservation.
(4) Per capita water use with 2 percent conservation is per capita water use without conservation reduced by 2 percent over the first 10 years then maintained at the resultant reduced rate for the remaining period.
(5) Average day consumption with conservation is projected population times per capita water use with 2 percent conservation.
(6) Reduction of average day consumption is average day consumption without conservation minus average day consumption with conservation.
(7) Calculated from average residential consumption without conservation.
(8) Calculated from average day residential consumption with 2 percent conservation using 20.7 percent DSL in 2022, 17 percent DSL in 2023, 14 percent DSL in 2024, and 10 percent DSL in all years from 2025 to 2043.
(9) Reduction of average day production is average day production without conservation minus average day production with 10 percent DSL and 2 percent conservation.

As shown in Table 4-3, in the year 2032 this water use efficiency schedule accounts for a savings of 17,626 gpd. At the end of the 20-year planning period, in 2043, this schedule accounts for a savings of 22,641 gpd. If both water use efficiency goals are achieved, the net water savings over the 20-year planning period will be about 132 million gallons total.

EVALUATION OF WATER RECLAMATION OPPORTUNITIES

The Revised Code of Washington (RCW) requires public water systems serving 1,000 or more connections to evaluate opportunities for reclaimed water when completing water system plans.

While the Town of Cathlamet serves slightly over 1,000 connections when including the Puget Island Water System, managed by Wahkiakum County PUD, the water available for reuse would come solely from the Town of Cathlamet since they have a wastewater treatment facility and the Puget Island Water System is served by individual septic systems.

Based on the 2021 estimated average number of people per household, by the end of the 20-year planning period, the Town of Cathlamet is projected to serve just over 1,000 connections. Once the town exceeds 1,000 connections, they will be required to evaluate opportunities for reclaimed water. The evaluation includes five elements:

1. Washington State requirements
2. Identification of potential reclaimed water users
3. Estimates of potable water savings if reclaimed water were available
4. Financial feasibility of implementing reclaimed water projects
5. Recommendations for implementing a reclaimed water program

WATER RECLAMATION AND REUSE REQUIREMENTS IN WASHINGTON STATE

"Reclaimed water" is defined in RCW 90.46.010 as "water derived in any part from wastewater with a domestic wastewater component that has been adequately and reliably treated, so that it can be used for beneficial purposes. Reclaimed water is not considered a wastewater."

In the State of Washington, any type of direct beneficial reuse of municipal wastewater is defined as water reuse or reclamation. The Departments of Health and Ecology have issued Water Reuse and Reclamation Standards jointly. This discussion is based on the current standards dated September 1997, which are adopted by reference in RCW Chapter 90.46, Reclaimed Water Use.

Washington State reuse standards are based on similar standards used throughout the United States. Washington's reuse standards for municipal wastewater can be grouped into four categories:

- Treatment Standards
- Permitted Uses of Reclaimed Water
- Use Area Requirements
- Operational and Reliability Requirements

Washington's reuse treatment standards call for *continuous* compliance, meaning that the treatment standard must be met on a constant basis or the treated water cannot be used as reclaimed water.

Treatment Standards

The State of Washington's standards for municipal wastewater reuse have four classifications based on the type of treatment provided. The classifications are summarized below in Table 4-4.

TABLE 4-4

State of Washington Reclaimed Water Treatment Standards

Reuse Class	Continuously Oxidized(1)	Continuously Coagulated(2)	Continuously Filtered(3)	Disinfection (Total Coliform Density)(4)	
				7-Day Median Value	Single Sample
A	Yes	Yes	Yes	≤2.2/100ml	23/100ml
B	Yes	No	No	≤2.2/100m1	23/100ml
C	Yes	No	No	≤23/100ml	240/100ml
D	Yes	No	No	≤240/100ml	no standard

(1) Oxidized wastewater is defined as wastewater in which organic matter has been stabilized such that the biochemical oxygen demand (BOD) does not exceed 30 mg/L and the total suspended solids (TSS) do not exceed 30 mg/L (monthly average basis), is non-putrescible (does not have a foul smell) and contains dissolved oxygen.

(2) Coagulated wastewater is defined as an oxidized wastewater in which colloidal and finely divided suspended matter have been destabilized and agglomerated prior to filtration by the addition of chemicals or an equally effective method.

(3) Filtered wastewater is defined as an oxidized, coagulated wastewater that has been passed through natural undisturbed soils or filter media, such as sand or anthracite, so that the turbidity as determined by an approved laboratory method does not exceed an average operating turbidity of 2 nephelometric turbidity units (NTU), determined monthly, and does not exceed 5 NTU at any time.

(4) Disinfection is a process which destroys pathogenic organisms by physical, chemical or biological means. The disinfection standards use coliform density as the measure of pathogen destruction. DOH recommends that a chlorine residual of 0.5 mg/L be maintained during conveyance from the reclamation plant to the use area to avoid biological growth in the pipeline and sprinkler heads.

Permitted Uses of Reclaimed Municipal Wastewater

Allowable water reuse methods within the State of Washington are presented in Table 4-5. Most of the allowable reuse methods provide limited opportunity for reuse due to the relatively small quantities and seasonal nature of the reuse demand. Two reuse methods that offer the potential for 100 percent reuse on a year-round basis are groundwater recharge and streamflow augmentation. A more detailed discussion of groundwater recharge and streamflow augmentation is provided after Table 4-5.

TABLE 4-5

Allowable Uses of Reclaimed Water

Use	Class of Reclaimed Water Allowed			
	Class A	Class B	Class C	Class D
Irrigation of Non-Food Crops				
Trees and fodder, fiber, and seed crops	YES	YES	YES	YES
Sod, ornamental plants for commercial use, pasture to which milking cows or goats have access	YES	YES	YES	NO
Irrigation of Food Crops				
Spray Irrigation:				
All food crops	YES	NO	NO	NO
Food crops which undergo physical or chemical processing sufficient to destroy all pathogenic agents	YES	YES	YES	YES
Surface Irrigation:				
Food crops where there is no reclaimed water contact with edible portion of crop	YES	YES	NO	NO
Root crops	YES	NO	NO	NO
Orchards and vineyards	YES	YES	YES	YES
Food crops which undergo physical or chemical processing sufficient to destroy all pathogenic agents	YES	YES	YES	YES
Landscape Irrigation				
Restricted access areas (e.g., cemeteries, freeway landscaping)	YES	YES	YES	NO
Open access areas (e.g., golf courses, parks, playgrounds, etc.)	YES	NO	NO	NO
Impoundments				
Landscape impoundments	YES	YES	YES	NO
Restricted recreational impoundments	YES	YES	NO	NO
Non-restricted recreational impoundments	YES	NO	NO	NO
Fish Hatchery Basins	YES	YES	NO	NO
Decorative Fountains	YES	NO	NO	NO
Flushing of Sanitary Sewers	YES	YES	YES	YES

TABLE 4-5 – (continued)

Allowable Uses of Reclaimed Water

Use	Class of Reclaimed Water Allowed			
	Class A	**Class B**	**Class C**	**Class D**
Street Cleaning				
Street sweeping, brush dampening	YES	YES	YES	NO
Street washing, spray	YES	NO	NO	NO
Washing of Corporation Yards, Lots, and Sidewalks	YES	YES	NO	NO
Dust Control (Dampening Unpaved Roads, Other Surfaces)	YES	YES	YES	NO
Dampening of Soil for Compaction (Construction, Landfills, etc)	YES	YES	YES	NO
Water Jetting for Consolidation of Backfill Around Pipelines				
Pipelines for reclaimed water, sewage, storm drainage, gas, electrical	YES	YES	YES	NO
Fire Fighting and Protection				
Dumping from aircraft	YES	YES	YES	NO
Hydrants or sprinkler systems in buildings	YES	NO	NO	NO
Toilet and Urinal Flushing	YES	NO	NO	NO
Ship Ballast	YES	YES	YES	NO
Washing Aggregate and Making Concrete	YES	YES	YES	NO
Industrial Boiler Feed	YES	YES	YES	NO
Industrial Cooling				
Aerosols or other mist not created	YES	YES	YES	NO
Aerosols or other mist created (e.g., cooling towers, spraying)	YES	NO	NO	NO
Industrial Process				
With exposure of workers	YES	NO	NO	NO
Without exposure of workers	YES	YES	YES	NO

<u>Groundwater Recharge</u>

Groundwater recharge with reclaimed water is permitted under the water reuse standards. Three categories of groundwater recharge are covered in the water reuse standards:

1. Direct injection to a drinking water aquifer;

2. Direct injection to a non-drinking water aquifer; and

3. Surface percolation.

Direct Injection to a Drinking Water Aquifer

Direct injection of reclaimed water to a drinking water aquifer must meet the water quality standards for primary contaminants (except nitrate), secondary contaminants, radionuclides and carcinogens contained in Table 1 of WAC 173-200, as well as maximum contaminant levels (MCLs) contained in the State Drinking Water Standards, WAC 246-290.

Additionally, for direct injection to a drinking water aquifer, preinjection treatment must include the following:

1. Turbidity $\leq$ 0.1 NTU (average) and $\leq$ 0.5 NTU (maximum)

2. Total organic carbon levels $\leq$ 1.0 mg/L

3. Total nitrogen $\leq$ 10 mg/L as N

4. Any other constituent limits deemed appropriate by DOH or Ecology

Direct Injection to a Non-Drinking Water Aquifer

Direct injection of reclaimed water to a non-drinking water aquifer must meet Class A reclaimed water treatment standards as well as the following additional criteria:

1. $BOD_5 \leq 5$ mg/L

2. TSS $\leq$ 5 mg/L

3. Any additional criteria deemed necessary by DOH or Ecology

Surface Percolation

Groundwater recharge using surface percolation requires at least Class A reclaimed water unless a lesser level is allowed under a pilot project status by DOH and Ecology. In addition to secondary treatment to provide oxidized wastewater, the process must include a "step to reduce nitrogen prior to final discharge to groundwater."

<u>Streamflow Augmentation</u>

For small streams where fish habitat has been degraded due to low instream flows, streamflow augmentation is an option allowed under the water reuse regulations and standards. This reuse method requires an NPDES permit and adherence to the Surface Water Quality Standards (WAC 173-201A). However, the key difference between streamflow augmentation and surface water disposal is that a determination of beneficial use has been established based on a need to increase flows to the stream. To make this determination requires concurrence from the Washington State Department of Fish and Wildlife that the need exists for additional instream flows.

The Town of Cathlamet has a couple small creeks; Abe Creek, and Cougar Creek, and one major river; the Elochoman River within or adjacent to its Urban Growth Area (UGA). The creeks feed directly into the Columbia River over a precipice that is not passable by fish. The Elochoman River also flows directly into the Columbia River and is the sole source water for the Town. The Town of Cathlamet wastewater treatment plant (WWTP) effluent flows through an outfall into the Columbia River.

<u>Other Uses</u>

The water reuse standards allow for other uses that are not discussed in detail in this Chapter. However, the general basis for the reuse criteria is that when unlimited public access to the reclaimed water is involved (as is the case for the reuse scenarios that might apply for the Town of Cathlamet) the criteria will require Class A reclaimed water. Essentially, for a water reclamation project to have the flexibility to allow for relatively unrestricted use, the reclaimed water should meet the Class A reuse standard.

Use Area Requirements

The water reuse standards establish criteria for siting and identifying water reclamation projects and their facilities. Water reclamation storage facilities, valves, and piping must be clearly color-coded and labeled and no cross connections between potable water and reclaimed waterlines are allowed. The potable water system manager must have an approved cross-connection control program pursuant to WAC 246-290-490.

Maximum attainable separation between reclaimed waterlines and potable waterlines must be achieved. A minimum horizontal separation of 10 feet is required for buried lines, but when crossing is necessary, a minimum 18-inch vertical separation is required and the potable waterline must be above the reclaimed waterline.

Reclaimed water may be used to flush toilets in condominiums and apartment complexes as long as residents do not have access to plumbing systems for repairs or modifications.

Another key requirement for a water reclamation project is setback distance. Table 4-6 summarizes setback requirements for water reclamation facilities. In general, setback distances are minimized with higher levels of treatment and reliability. Class A reclaimed water requires no buffer between irrigated areas and public use areas.

TABLE 4-6

Setback Distances for Reclaimed Water in the State of Washington

Reclaimed Water Use/Facility	Distance (Feet)			
	Class A	Class B	Class C	Class D
Minimum Distance to Potable Water Well:				
Spray or Surface Irrigation	50	100	100	300
Unlined Storage Pond or Impoundment	500	500	500	1,000
Lined Storage Pond or Impoundment	100	100	100	200
Pipeline	50	100	100	300
Minimum Distance from Irrigation Areas to Public Areas	0	50	50	100

Operational and Reliability Requirements

Under the reuse standards, there are a number of operational and reliability requirements for a water reclamation plant. Several key requirements are summarized below.

- Minimum Class III Operator.
- Critical equipment and process failures must be signaled by an alarm.
- Emergency storage and disposal facilities in the event of equipment failure or the intermittent production of effluent that does not meet the reclaimed water standards.
- Operating records provided to DOH as well as Department of Ecology.
- No bypass of untreated or partially treated water.
- Either a standby power supply or long-term disposal or storage facilities for untreated wastewater.

POTENTIAL RECLAIMED WATER USERS

Inventory of Large Water System Users

Table 2-11 shows that top 10 largest water users accounted for over 54 percent of metered consumption in 2021, with the approximately 43 percent being attributed to the Puget Island system. Commercial water use within the Town of Cathlamet accounted for approximately 17 percent of total consumption in 2021.

Parks and Recreational Areas

The Town of Cathlamet has the local high school athletic fields and a golf course located outside the Town limits that would be considered irrigable property. Irrigable property is defined as areas with managed landscapes having grass, flowers or shrubs. To date, these activities are not separately metered, so it is unknown the quantity of water utilized for irrigation.

Sewer Jetting

The Town of Cathlamet wastewater collection system could utilize reclaimed water to jet sewer wastewater collection piping and for other operational uses at the wastewater treatment plant.

CURRENT AND FUTURE WASTEWATER FLOWS

The Town's Wastewater Treatment Facility (WWTF) has an average annual design capacity of 188,000 gallons per day. The Town's projected influent flows to the Wastewater Treatment Facility (WWTF), which are presented in Table 4-7.

TABLE 4-7

Projected WWTF Flows for the Town of Cathlamet(1)

All Flows in gpd	2027	Buildout
Average Dry Weather Flow	127,000	349,700
Average Annual Flow	188,000	372,400
Maximum Month Flow	383,000	500,300
Peak Day Flow	971,000	574,300

(1) Town of Cathlamet Wastewater Facilities Plan Amendment, January 2008.

In addition to the water quality of the reclaimed water, the diurnal and seasonal variations in flow will be a major consideration in the design of reuse facilities. These issues will be considered further in the water reuse feasibility analysis.

WATER REUSE FEASIBILITY ANALYSIS

Groundwater Recharge

Groundwater recharge by direct injection would potentially be the most expensive reuse option because it would require upgrading the wastewater treatment plant to include Class A treatment plus reverse osmosis treatment and TOC removal. However, groundwater recharge by surface percolation involves a lesser degree of treatment.

The Town of Cathlamet is currently discharging treated effluent to the Columbia River. Because of the significant costs, technical challenges and limited benefits that might be derived from a reuse strategy involving groundwater recharge, direct injection is not considered a feasible option by the Town.

Streamflow Augmentation

Based on the Washington State Department of Ecology's draft 2002/2004 Water Quality Assessment 303(d) list for non-pollutant impaired streams, there is a single river in the vicinity of Cathlamet that would benefit from streamflow augmentation. The key with any streamflow augmentation project is establishing benefit to habitat. Generally speaking the rivers and streams in the vicinity of Cathlamet are subject to low streamflows during the late summer months.

Streamflow augmentation could be considered a feasible option by the Town; however, the amount of water that would be added and the distance it would have to be piped are not cost effective.

Irrigation

Irrigation of the Town's athletic fields is likely the most beneficial and feasible use for reclaimed water in the Town. Since all of the Town's irrigation needs are not yet accounted for due to the short amount of time the athletic fields have been in existence, the cost and quantity of reclaimed water use for this purpose cannot yet be determined.

Components of Water Reuse System

If there was substantial demand for reuse within the Town of Cathlamet, the Town could potentially supply those users with non-potable water. Costs to upgrade the treatment plant and lay 'purple pipe' to the areas of need would range in cost from an estimated 5 to 10 million dollars based on similar projects.

For the foreseeable future, the Town can meet its water conservation goals without investing in such a significant project. Additionally, there appear to be no insurmountable environmental pressures for the Town to discontinue discharging treated effluent to the Columbia River. Therefore, this preliminary analysis indicates that the costs significantly outweigh potential benefits for developing a water reuse capability.

The Town may give further consideration to water reuse at a later date. Costs for upgrades to the WWTF and water distribution system would be further refined in a detailed study. An evaluation of financing options, which would likely include a combined effort of grants/loans and rate increases, would be included in this study.

CHAPTER 5

WATERSHED CONTROL PROGRAM

INTRODUCTION

In Washington State, water supply systems using a surface water source must develop and implement a watershed control program to protect the water supply and the health of water system customers. This chapter has been prepared to fulfill the watershed control program requirements for a filtered system, in accordance with WAC 246-290-668.

WATERSHED DESCRIPTION

The Elochoman River intake structure for the water treatment plant is located approximately 4 river miles (RM) upstream from its confluence with the Columbia River. Terrain within the watershed consists primarily of hilly, forested land with some flatter valley bottomlands. The vegetation within the basin is predominantly forestland with some valley bottomlands in agricultural production. The primary land use within the watershed area is forestry, comprising approximately 97 percent.

The stream gage closest to the intake structure is the United States Geological Survey (USGS) Station 14247500, located above the confluence of the Elochoman River and Beaver Creek. Mean annual flow at that gage for the 30 years of record is 375 cubic feet per second (cfs) and extreme high and low flows are 5,410 cfs and 15 cfs, respectively. Stream length from gage to drainage basin divide is approximately 19.4 miles. The mean basin elevation is 1,190 feet above sea level. Eighty-eight percent of the land within the basin was covered by forest as of 1984 and 2 percent is covered by lakes. This basin data was provided in 'Streamflow Statistics and Drainage-Basin Characteristics for the Southwestern and Eastern Regions, Washington, Volume 1' published by the USGS in 1985.

LOCATION AND SIZE

Figure 5-1 shows the location and size of the Elochoman River drainage basin and watershed. The watershed is located north and slightly east of the Town of Cathlamet. The drainage basin consists of approximately 40,000 acres above the intake structure and is located in portions of three counties; the largest portion is Wahkiakum County followed by Cowlitz and Lewis Counties.

LAND USE AND OWNERSHIP

The 40,000-acre drainage basin is a mix of very low density rural residential (10 to 20 acres), medium density residential (1 to 2.5 acres), low density (2.5 to 5 acres), agriculture/conservation (20+ acres), forest resource use, and publicly managed lands. Approximately 20 percent of the lower watershed is zoned in the aforementioned residential and agricultural/conservation classifications, the remaining 80 percent of the upper watershed is forest resource and publicly managed land. Some of the largest landowners include: Hawaii Ers Timberland LLC, Pacific West Timber Co. LLC, Alco Holdings LLC, Manulife Insurance CO, ET AL, L & C Tree Farms LLC, Weyerhaeuser Timber Holdings Inc., and the State of Washington.

ROADS AND TRAILS

State Route 407 (SR 407) bifurcates the watershed for approximately two-thirds of its length beginning at the mouth of the Elochoman River and follows the course of the river. The State Route provides access to the treatment facility and two fish hatcheries, the Beaver Creek Hatchery and the Elokomin Hatchery. Two smaller county roads including Schoonover Road and Beaver Creek Road provide access to a limited number of residences in the lower reaches of the watershed. There are also numerous logging roads and foot trails throughout the drainage basin.

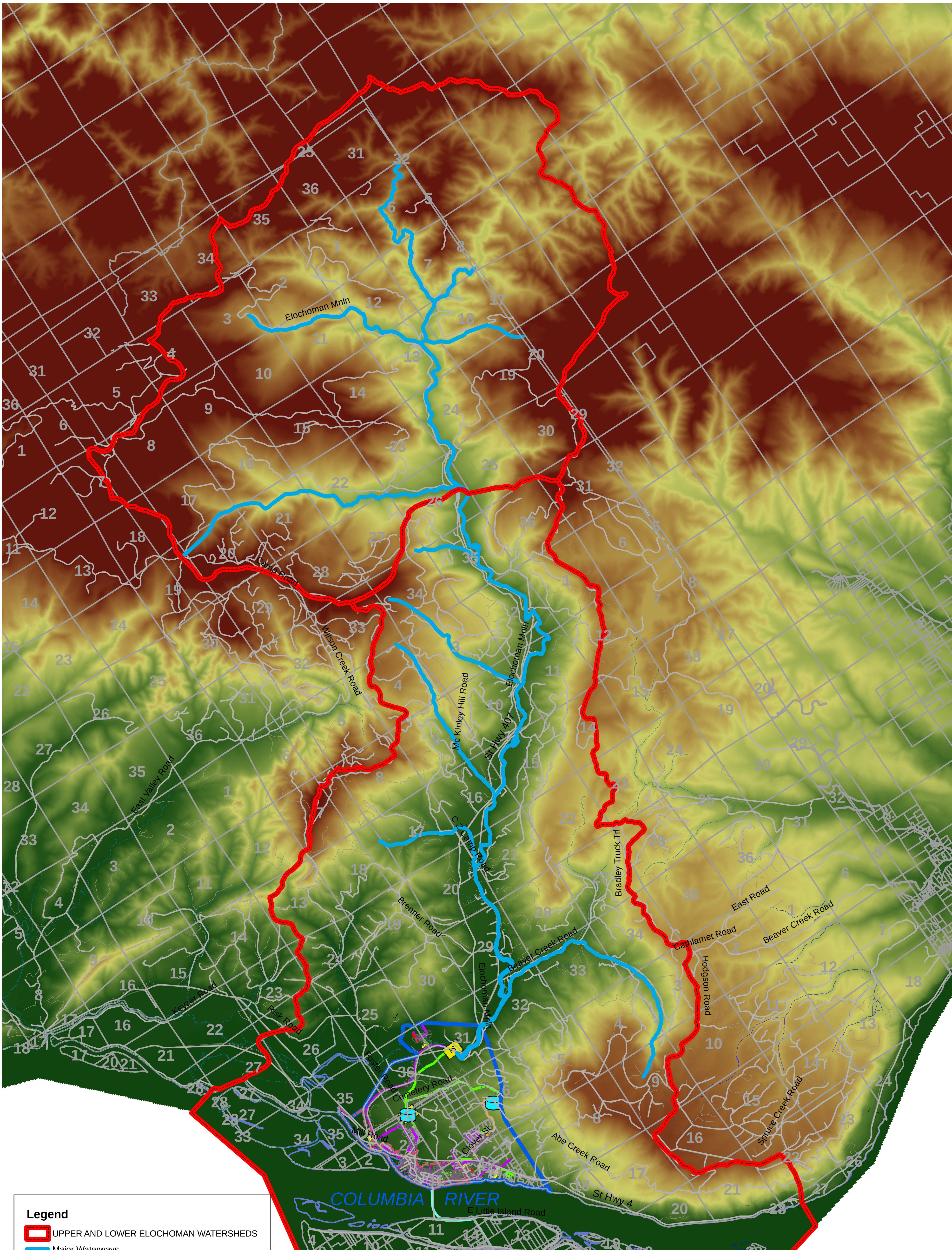
HYDROLOGY AND GEOLOGY

According to the U.S. Climate Normals, a data search from the National Centers for Environmental Information, the mean annual precipitation measured at Cathlamet between 1991 and 2020 averaged approximately 79.8 inches per year with approximately 31 inches accumulating during winter months.

The drainage basin soils are primarily very deep to deep, very well drained to well drained, siltstone and sandstone in the uplands surrounding the Elochoman River. Soil types in the uplands and mountains include Raught-Germany and Bunker-Knappton soils. Soils on the marine terraces and uplands include Lytell-Astoria and Zenker-Elochoman soils. In the river bottom the Grehalem-Rennie soils are typically very deep and either well or poorly drained. Slopes vary from flat terrain along the river bottom to steep slopes of 70 percent. The bulk of the area is in the upland category with slopes ranging from 30 percent to 60 percent.

FLORA AND FAUNA

The vegetation within the drainage basin consists primarily of woodland areas. The principal trees include Douglas fir, western hemlock, and red alder. Understory species include salmonberry, salal, red huckleberry, and western swordfern.



Legend

- UPPER AND LOWER ELOCHOMAN WATERSHEDS
- Major Waterways
- Town Limits
- Service Area
- Reservoirs
- PS Pumps
- Vavles
- Less than 2"
- 4" Water Line
- 6" Water Line
- 8" Water Line
- 12" Water Line
- Puget Island Service Line

N

12,500 6,250 0

SCALE: 1"=6,250'

TOWN OF CATHLAMET

FIGURE 5-1
WATERSHED BOUNDARY MAP

Gray & Osborne, Inc.
CONSULTING ENGINEERS

CGASKIN C:\GIS\DATA\WAHKIAKUM_CO\CATHLAMET\Project MXD's\FIGURE 1-3.mxd

INVENTORY OF CONTAMINANTS

Activities and land uses which are detrimental to water quality are widespread, and include both point and non-point contaminant sources. The following activities and land uses are discussed in order of priority based upon their potential to degrade water quality in the Elochoman River.

Logging operations should be considered the primary threat to water quality in the Elochoman River at the water treatment plant intake. Effects of logging operations may include high turbidity levels after heavy rainfalls due to clear cutting operations and road building operations, as well as possible contaminations resulting from fuel and oil spills related to logging equipment operations. Another potential risk to water quality in the river would stem from chemicals used for fire prevention and control operations by logging interests.

Elochoman Valley Road, a county road often still referred to as SR 407, follows alongside the Elochoman River for approximately 6 miles before becoming a private forestry road. Elochoman Valley Road is used primarily by private residents, recreationalists, and logging interests. In addition, spraying of weeds and other operation and maintenance practices related to the upkeep of Elochoman Valley Road may also affect water quality and should be monitored.

There are a number of agricultural operations in the Elochoman Valley upstream of the water treatment plant intake, which have the potential to adversely affect water quality. These adverse affects would most likely stem from over application or spilling of agricultural chemicals such as pesticides or fertilizers. Presently, there are no dairies in operation upstream of the water treatment plant intake.

On-site septic systems are prevalent in the Elochoman River Valley upstream of the water treatment plant intake. These septic systems have the potential to affect water quality; however, a high failure rate would have to occur for any changes to be detectable at the water treatment plant, unless a system were to fail which was located very near the river or one of its tributaries. As a preventative measure, the Town will coordinate with Wahkiakum County to maintain involvement in the permitting and inspection of new and existing septic systems upstream of its water treatment plant intake.

Other uses of the watershed include recreational activities such as hunting, fishing, and hiking.

WATER RIGHTS

A water rights analysis for the Town of Cathlamet is presented in Chapter 3. The total water rights available for the system are 1.83 cfs (821 gpm) instantaneous withdrawal rate (Q_i) and 633.8 Acre-Feet per Year (ac-ft/yr) annual withdrawal rate (Q_a) of which the maximum withdrawal between May 1 through September 30 is limited to 308.8 (ac-ft/yr).

In 2001, the Town purchased an additional 0.5 cfs of water rights from the Elochoman River from a local farmer. This water right is included in the above instantaneous and annual water right quantities. The Town of Cathlamet has no additional water rights applications pending. The Town of Cathlamet Water Rights Certificates and Permits are included in Appendix B.

WATER QUALITY RISK ASSESSMENT

A detailed analysis of the Town's source water quality can be found in Chapter 3 of this document. The Washington State DOH has rated the Town's drinking water source as high susceptibility for contamination.

WATERSHED CONTROL PROGRAM

The Town of Cathlamet will continue to execute and update its Watershed Control Program. Since the program is predominantly an education/awareness program, assessment will be based upon data collection and water quality monitoring. Data collection will include the listing of potential contaminant sources such as the fish hatcheries and a summary of their fish rearing processes, a list of all logging companies and their planned activities and chemical usage, a list of agricultural operations and their chemical uses and activities, and a list of the largest property owners in the basin and their land uses.

Water quality monitoring will be conducted as required by the DOH at the intake structure. This monitoring includes coliform monitoring and other testing of the source water. As there is no dam or other water impoundment present on the Elochoman River that controls its flow, contaminants reaching the river upstream of the water treatment plant intake will flow to the intake unimpeded. Thus, any spill reports or observed changes in raw water quality will be followed up immediately.

The Town will contact the individual companies that own timber rights in the watershed and the surrounding lands to determine the practices they follow in using the watershed. The Town will obtain any forest practice applications the respective timber owners have in the area. The Town will pursue agreements with these timber owners for notification of spraying/fertilizing operations within the watershed. Additionally, the water treatment plant should be contacted if contamination problems arise as a result of transportation aspects of the logging and agricultural interests in the valley.

WATERSHED CONTROL ACTIONS

Appropriate contingency planning for continued operation of the water system in the event of contamination to the Elochoman River is the key to successful emergency operation. Prevention of further raw water contamination will require shut down of the Elochoman River intake and the water treatment plant to allow time to assess contamination. During that time, reservoir levels will need to be closely monitored and emergency conservation measures put into effect to conserve a short-term supply of potable water.

The following is a list of actions the Town will consider implementing to ensure the future protection of the Elochoman watershed.

INCREASE KNOWLEDGE OF WATERSHED ACTIVITIES

The Town will keep up to date on who owns land on or within the perimeter of the watershed. Each time the land ownership is changed on the perimeter of the watershed, the Town will attempt to notify the landowner of the possible impacts they may have on the watershed. The Town will also notify the County that the Town is interested in any planning activities or building permits that are occurring within the watershed boundary.

The Town will attempt to contact the owners of property in the watershed to determine any activities that are occurring. A list of property owners and their respective acreages should be kept and maintained by Town staff.

SECURE ACCESS TO DRAINAGE BASIN

Access to the Town's treatment facility is secured and locked at the entrance. It is not possible to secure the access to the entire watershed due to its size and private ownership. The Town will post signs along roads in the watershed indicating the surrounding area provides the water supply to the Town of Cathlamet and Puget Island and that activities within the watershed contribute to the Town's overall water quality.

WILDLIFE PROGRAM

Beaver activity has been identified within the watershed. When the beavers are identified within the watershed, the Town works with Wahkiakum County to trap and remove beavers from the watershed area.

MONITOR DRAINAGE BASIN

A member of the Town staff travels to the treatment plant daily. Town staff patrol the watershed perimeter and access roads as frequently as time permits. The Town will continue to monitor the watershed. All Town staff that are responsible for monitoring activities in the watershed should be knowledgeable about the watershed boundaries, access, and the potential impacts that various activities can have on the watershed. Most of the forestland is behind locked gates, which effectively limit activity to logging and forest management.

EROSION PREVENTION

Any entities who perform logging or road building within or near the watershed area should use Best Management Practices (BMPs) when performing these activities. The Town will seek assistance to reseed or replant any area within the watershed, which are damaged by forest fires. The Washington State Forest Practices Act is the governing regulation which has the most effect on the Town's watersheds. This Act exerts control over the timber harvesting and road building activities with respect to riparian buffers and overall water quality. The Town will review Forest Practices Applications submitted to the Washington State Department of Natural Resources (DNR) for projects in the watershed. If the landowner is not aware of the use of these watersheds as the drinking water source for the Town, they will be informed by letter of this fact as well as any other specific concerns that the Town may have regarding a particular project. The landowner will be provided key telephone numbers to contact Town personnel in case of an emergency. For a copy of the Forest Practices Act Frequently Asked Questions see Appendix M.

EMERGENCY RESPONSE

In the event of a fire or any life-threatening situations, 911 should always called first. If an emergency concerning the watershed should occur, such as a spill or illegal activity within the watershed, the following individuals or agencies should be contacted immediately.

Wahkiakum County Sheriff Dispatch ....(360) 795-3242

Town of Cathlamet Fire Department 911

Washington State Department of Health
    Division of Drinking Water (SW Office) ....(360) 236-3030
    24 Hour Drinking Water Emergency Hotline ....(877) 481-4901
    (800) 525-2536

Water Quality Superintendent ....(360) 795-6041
    (360) 751-4672
    Superintendent Emergency Hotline ....(360) 795-8032
    Town Hall ....(360) 795-3203
    Water Treatment Plant……… ....(360) 795-3650

Department of Natural Resources
    Report a Forest Fire Hotline ....(800) 562-6010

CHAPTER 6

OPERATION AND MAINTENANCE PROGRAM

INTRODUCTION

The objective of this Chapter is to provide an evaluation of the Town of Cathlamet's Operation and Maintenance (O&M) Program and its ability to assure satisfactory management of the water system operations in accordance with WAC 246-290. The Town's specific component related documentation is maintained by the Town for use by operations personnel.

The O&M Program includes the following elements:

- Water System Management and Personnel
- System Operation and Control
- Inventory of Repair Materials
- Emergency Response Program
- Cross-Connection Control Program
- Customer Complaint Response Program
- Recordkeeping and Reporting
- Sanitary Survey Findings
- Operations Program Summary

WATER SYSTEM MANAGEMENT AND PERSONNEL

The Town of Cathlamet is governed by a mayor and five-member Town Council. The Town of Cathlamet's Water System is publicly owned and maintained by the Town. Water system staff include a Public Works Superintendent and three utility maintenance workers. The Town's water system personnel and classification are described below.

OPERATOR CERTIFICATION

State law requires Group A public water systems to retain operators certified as competent to operate and manage the system. WAC 246-292 describes the requirements for cities and for operators. Both the Town's distribution system and Water Treatment Plant are separately classified and must have operators that meet the designated certification classes.

According to WAC 246-290-040, the distribution system is classified based on the population the water system serves. Given that the Town serves a population between 251 and 1,501, the system is designated as a Class 1 Water System. WAC 246-292-050 requires that water systems have at least one certified Water Distribution Manager

(WDM) and that the WDM at least be certified to the distribution system classification level of the system, if not higher. The Town has two operators with suitable WDM certification. A water treatment plant is classified based on a point rating system described in WAC 246-290-040. DOH has determined that the Town of Cathlamet's Water Treatment Plant requires a Class 3 designation. The Town now has a water treatment plant operator (WTPO) with Level 3 certification. Additional WDM and WTPO certifications for the Town's water system personnel are listed below in Table 6-1.

The Town of Cathlamet's Cross-Connection Control Program (Appendix E) also requires the Town to have a certified Cross-Connection Control Specialist (CCS) and Backflow Assembly Tester (BAT). The BAT must inspect, test, and monitor the Town's backflow prevention assemblies in accordance with WAC 246-290-490. The Town currently does not have a certified CCS nor anyone with BAT certification. The Town's current CCS recently retired but will still be on-call until a new CCS is certified. Additionally, customers may have their device tested by an approved third-party BAT. Certifications for water system personnel are listed in Table 6-1.

TABLE 6-1

Town of Cathlamet Water System Personnel Certifications

Staff	Position	Certification(s)
David McNally	Public Works Superintendent	WTPO 2, WDM 2, WWTPO 1
Jay Watson	Utility Maintenance Worker III	WTPO 3, WDM 2, WWTPO 4
James Smith	Utility Maintenance Worker I	In training
Troy Gorley	Utility Maintenance Worker I	In training

PROFESSIONAL GROWTH REQUIREMENTS

To promote and maintain expertise for the various grades of operator certification, Washington State requires that all certified operators meet professional growth requirements by completing no less than three Continuing Education Units (CEUs) within each 3-year period. Programs sponsored by both the Washington Environmental Training Resource Center (WETRC) and the American Water Works Association (AWWA) Pacific Northwest Subsection are the most popular sources of CEUs for certified operators in Washington State. The professional growth requirement may also be met by certification advancement through examination or certification in a different classification.

The Public Works Superintendent maintains the status of staff CEUs. Resources to obtain training are provided by the Town as necessary to maintain these credits.

SYSTEM OPERATION AND CONTROL

The Town of Cathlamet staff is responsible for the daily operations of its water treatment plant, storage facilities, and distribution system. The system has a total of five pressure zones. The water level in the Greenwood Reservoir is maintained by the pumps at the Water Treatment Plant. A float switch in the Greenwood Reservoir signals the pumps when there is a water demand. Currently, the reservoir has a 4-foot cycle between the pump on and pump off cycle.

The Town's raw water intake is located adjacent to the Town's water treatment plant. The intake consists of a 90-foot-long, 10-inch-diameter polyethylene pipe with concrete anchors located at 20-feet on center. The intake pipe is perforated with 1/4-inch-diameter holes evenly spaced to provide 40 holes per linear foot of pipe. The pipe is installed in a gravel trench in the Elochoman River approximately 5 feet below the riverbed. The intake pipe terminates in a manhole on either side of the river. Water from the intake pipe flows by gravity into the raw water pump station manhole. Two 350-gpm vertical turbine pumps convey water from this manhole into the Water Treatment Plant. A slide gate isolates the raw water manhole from the intake pipe.

A secondary surface water intake was constructed next to the infiltration pipe to allow the plant to draw in raw water from the Elochoman's surface when the infiltration pipe capacity is restricted by sediment or when water levels get low.

The Town currently has two water storage reservoirs with a total capacity of 1,030,000 gallons. The Greenwood Reservoir has a capacity of 500,000 gallons, while the Kent's Bridge Reservoir has a capacity of 530,000 gallons. All water from the Water Treatment Plant is pumped to the Greenwood Reservoir. From the Greenwood Reservoir, a portion of the water is pumped to the Kent's Bridge Reservoir by the Greenwood Pump Station. The Greenwood Pump Station is controlled by the level in the Kent's Bridge Reservoir.

Most of the distribution system is gravity fed and requires no active operation aside from setting PRVs. A majority of the downtown area is serviced by looped mains. The isolation of one main in this area will not have a major impact on regular service. Water mains to the outlying areas are not looped and closing lines in these areas effectively shuts down service for the term of the line closure. Closure of some of the looped lines within the system will also affect system pressures during high flow events.

IDENTIFICATION OF MAJOR SYSTEM COMPONENTS

The locations of the major water system components are shown in Figure 1-2. The major components of the Town's water system include a treatment plant and raw water intake structure, two reservoirs, a booster pump station, five PRV Stations, and the water distribution system.

Raw Water Intake

The intake is located under the Elochoman River adjacent to the water treatment plant. However, it is still susceptible to flood related damage. Such damage could include clogging or complete loss of the intake pipe. The Town has mitigated the effects of flood damage by burying the intake structure approximately 5 feet below the riverbed's bottom. However, the intake must be flushed regularly with air to function properly. The addition of a secondary intake helps mitigate clogging and low water level problems.

Treatment Plant

The Water Treatment Plant site may be subject to any number of threats including flooding, water quality constraints, vandalism, power outages, and mechanical failures. Potential problems, which may be caused by flooding can include contamination of the clearwell due to the inflow of flood waters, damage to electrical components, and damage to any other components which are near the ground. Water quality changes in the river, such as high turbidity, significant pH changes, or chemical contamination, could be beyond the capability of the plant. Most of the treatment plant components are inside the treatment plant building and all outside doors should always be locked when personnel are not present. Power outages cannot be prevented, fortunately they do not occur often. The Town of Cathlamet is currently working on a project to install a permanent emergency generator at the Water Treatment Plant. The generator installation is expected to be completed in late 2023. This generator will give the Town the ability to continue operations at the treatment plant in a power outage situation without having to manually hook up a rented generator.

Reservoirs

Vulnerability concerns for a reservoir includes the potential damage to the structure and contamination of its contents. The storage reservoirs were constructed to reduce the potential for vandalism by being completely sealed with locked hatches. Vandalism cannot be completely prevented but can be deterred. To deter such acts, all locks and other protection equipment are inspected during every site visit and will be repaired or replaced when needed. Vent screens should be checked twice a year and repaired as needed to prevent birds or others wildlife from entering the reservoir. The reservoirs may still be susceptible to natural and man-made disasters such as earthquakes or vandalism.

Booster Pump Station

The Town's booster pump station (Greenwood BPS) is the sole source of supply for its customers in Zones 2, 3, and 4. Potential threats to the well-being of the booster pump station include: mechanical failures, vandalism, power outages, loss of reservoir, as well as other accidental situations. The booster pump station was constructed with multiple pump redundancy to minimize problems with mechanical failures. The station was designed to be well protected against vandalism inside the pump house. The station is equipped with electrical pigtails and a manual transfer switch for the connection of an external generator during power outages. Loss of the Greenwood Reservoir would require pumping directly from the water treatment plant to the booster pump station. While this is certainly not an ideal condition, it is possible under an emergency situation. The system operated this way for about 6 weeks while the Greenwood Reservoir was being repainted mid-May through June 2007.

Pressure Reducing Valve Stations

The Town currently has five pressure reducing stations, which serve the five pressure zones. These PRV stations include the Greenwood Reservoir PRV, Eagle Point PRV, Columbia Street PRV, Puget Island PRV, and Cochran Drive PRV. Pressure reducing valves regulate the pressure in a certain zone as to not put unnecessary strain on the pipes.

Distribution

Distribution system vulnerability could arise from breaks in the piping network, causing an extensive loss of water, and thereby depleting storage in addition to potentially causing flooding, loss of service, and contamination of the water. All systems are expected to have some breaks, however, to reduce the number of breaks, construction standards regarding pipe bedding and materials should be followed. Properly marked and operating isolation valving will help reduce problems associated with distribution breaks. The Town will implement a valve exercising program with copies of up-to-date maps available at the treatment plant and in all maintenance vehicles showing the entire distribution system with all the isolation valves clearly marked.

WATER QUALITY MONITORING

The Town receives an annual statement from DOH that indicates what water quality tests are required and when they are required. The monitoring requirements for 2022 are provided in Appendix I. An analysis of the Town’s most current water quality test results is included in Chapter 3. The Town is also required to publish a Consumer Confidence Report (CCR) every year to provide customers with water quality data and explanations on any deficiencies the water system may have. A copy of the most recent CCR can be found in Appendix G.

Water quality monitoring is conducted by the Public Works Department. The Public Works Superintendent is responsible for scheduling and collecting samples based upon DOH requirements. Town personnel using a HACH DR2 conduct chlorine sampling within the distribution system. The sampling procedure is in accordance with the manufacturer recommendations. The Town is required to test for a chlorine residual within the distribution system. The Town must have a detectable amount of chlorine in at least 95 percent of the samples taken each month.

Bacteriological samples are required to be taken in accordance with the Coliform Monitoring Plan in Appendix I. Samples are delivered by Town personnel to the Wahkiakum County Health Department office in Cathlamet for testing. Sample bottles are picked up at the Health Department as needed. The County sends the results directly to the Town and DOH. The Town stores a copy in the water quality file located at Town Hall.

For other chemical testing the Town uses ALS Environmental Lab in Kelso, Washington. Bottles for testing are usually requested by the Town 2 to 3 days in advance and are delivered by mail to the Town. Samples are sent back to the lab via the mail. The Town stores the results in the water quality file located at Town Hall.

PREVENTIVE MAINTENANCE

The most cost-effective method for maintaining a water system is to provide a planned preventive maintenance program. A planned preventive maintenance program can provide the optimum level of maintenance activities for the least total maintenance cost. Typical tasks that are performed on a daily, monthly, or yearly basis are listed below in Table 6-2.

TABLE 6-2

Preventive Maintenance Tasks

Frequency	Tasks
Daily	• Respond to customer inquiries. • On-call 24 hours per day. • Respond to service requests. • Monitor chlorine and fluoride residuals and turbidity. • Monitor for leaks in the system. • Visit treatment plant and record meter readings and river stage level and ensure proper operation of treatment equipment. • Monitor water level in the reservoirs
Monthly	• Collect routine coliform samples. • Inspect reservoir hatches, vents, and screens.
Yearly	• Inspect all Town-owned backflow prevention devices. • Flush distribution system and repair leaks. • Inspect watershed protection area for contaminant sources. • Inspect and exercise hydrants and valves.
As Needed	• Clean reservoirs (every 5 years or as needed). • Recoat reservoirs

Treatment Plant/Raw Water Intake

The treatment plant is managed by a certified operator. Daily operations include monitoring reservoir levels, monitoring operation of the raw water intake, taking daily water quality samples as required, and recording this information on water treatment plant monthly reports. Further daily tasks include checking chemical feed systems, adjusting chemical feed rates as needed, monitoring backwash cycles and general plant cleaning and upkeep. Depending on the time of year the raw water intake is flushed every 1 to 5 days.

Reservoirs

Improperly maintained reservoirs can cause contamination in public water systems. This is a result of contaminants entering the reservoir through cracks or openings at the vent, overflow or drain screens. Deteriorating hatch covers and vandalism can also compromise reservoir water quality. Poorly designed and maintained reservoirs can hamper the emergency operation of a water system. Written documentation of reservoir maintenance should be completed with each inspection and repair, and a copy of the report retained on file.

Each of the storage reservoir sites is visited monthly. Site visits check water levels and inspect the site for damage or vandalism. Inspection includes checking fencing, locks, and hatches for evidence of intrusion. Storage reservoirs shall be drained, cleaned, and inspected every 5 years. Painting and other maintenance shall be scheduled on an as needed basis, based upon observed conditions.

Booster Pump Stations

The Town booster pump station is visited daily and checked for vandalism and pump run status. Pump run times should be recorded along with reservoir elevations. Abnormalities in pump sounds or operation are to be noted and repaired as needed. The pump start and stop features, along with alternating pump controls, shall be tested on a monthly basis.

Distribution System and Valve Maintenance

Good preventive maintenance dictates that all valves be exercised regularly. An important aspect of distribution system valve maintenance and record keeping is to ensure that distribution valves are completely open. A partially closed valve can reduce peak day operation and fire flow. To maintain PRV stations, the Town exercises its valves, inspects the PRV settings, and clean them out as needed to keep the stations running efficiently and to prevent failure.

The distribution lines are predominantly along existing roadways. Therefore, any visible leaks or exposures should be noticed by the public and reported to the responsible authority. Several thousand feet of water main has been constructed along gravel logging roads. The Town can watch for leaks in this section of line when traveling to inspect the Kent's Bridge Reservoir. Faulty pipe should be repaired as time permits depending on the severity of the problem.

The Town will conduct a valve exercising program for all system valves 6 inches or greater on an annual basis. The Town will exercise all valves annually.

Hydrant Maintenance

Hydrants should be inspected regularly and repaired if necessary. It is important to maintain good records of hydrant maintenance. The Cathlamet Fire Department does the Town's hydrant flushing and testing. A waterline flushing program will be conducted semiannually by the Town on dead-end lines as well as on an as needed basis per customer concerns. The following recommended procedure for testing fire hydrants has been adapted from the American Water Works Association (AWWA) (1989).

- Check appearance of hydrants for visible damage or leaks. Check for residue stains on the hydrant.
- Remove an outlet nozzle cap and sound for leakage.
- Check for presence of water or ice in the hydrant body with a plumb bob.
- Replace the outlet nozzle cap. Open the hydrant a few turns and allow air to vent. Tighten cap.
- Open the hydrant fully.
- Check for leakage at flanges and around outlet nozzles, packing, and seals.
- Partially close the hydrant so the drains open and water flows through under pressure for about 10 seconds, flushing the drain outlets.
- Close the hydrant completely.
- Remove an outlet nozzle cap and attach a fire hose or some other deflector.
- Open the hydrant and flush.
- Close the hydrant and check for operation of the drain valve.
- Check the main valve for leakage.
- Remove all outlet nozzle caps, clean and lubricate threads.
- Check chains and cable for free action.
- Replace caps and tighten.
- Check lubrication of operating nut threads.
- Locate and exercise auxiliary valve. Leave open.

Distribution System Flushing

Distribution system flushing will be conducted on a regular basis to help reduce stagnant water in the distribution system that could contribute to water quality problems. This task will be combined with the hydrant maintenance.

Meters

Accurate water metering is an essential financial and conservation-oriented component of water system infrastructure. A substantial amount of revenue may be lost through inaccurate metering of residential and commercial accounts. The importance of accurate source meter readings cannot be overestimated. Without accurate source meter readings, the Town cannot determine lost and unaccounted-for water volumes or accurately bill its customers.

The life expectancy of service meters is approximately 20 years. The Town is currently in the process of installing AMI capable ultrasonic water meters as the existing meters begin to fail. Once enough new meters have been installed the Town will install the AMI collector infrastructure to automatically collect meter data. Currently the new ultrasonic meters must be ready manually until the full system is up and running. As of 2022, the Town has no meter testing equipment and as such, continually maintains a stock of new meters to replace meters determined to be faulty.

INVENTORY OF REPAIR MATERIALS

The Town maintains repair supplies including the appurtenances needed to make emergency repairs. At a minimum the materials on hand include the materials necessary to repair leaks for every size and type of pipe in the distribution system. Additional repair materials can be purchased in the closest cities of Longview and Vancouver/Portland if necessary.

EMERGENCY RESPONSE PROGRAM

Water utilities have the responsibility to provide an adequate and reliable quantity and quality of water at all times. To meet this requirement, utilities must reduce or eliminate the effects of natural disasters, accidents, and intentional acts. Although it is not possible to anticipate all potential disasters affecting the Town’s water system, procedures are formulated to manage and remedy common emergencies.

WATER SYSTEM PERSONNEL EMERGENCY CALL LIST

Table 6-3 provides phone numbers for emergency contacts including response agencies, governments, and material suppliers.

TABLE 6-3

Water System Emergency Phone List

Agency/Group/Business	Contact	Phone Number
Fire/Police Emergency	--	911
Town of Cathlamet Fire Department	Vernon Barton	(360) 795-8065
Wahkiakum County Sheriff	Mark C. Howie	(360) 795-3242
Washington State Patrol	Kelso Detachment Naselle Detachment	(360) 578-4147 (360) 596-4000
Water System Equipment and Supplies	H.D. Fowler Company	(360) 574-9377
Wahkiakum County Health Division	Coliform Testing	(360) 795-6207
ALS Environmental Laboratory	Inorganic chemical testing (VOC/SOC testing)	(360) 577-7222
Washington State Testing Laboratory	Inorganic chemical testing	(206) 418-5400
Washington State Department of Health	SW Regional Office	(360) 236-3030
Washington State Department of Health	After-Hours Emergency	(877) 481-4901
Washington State Department of Ecology	Spill Response	(360) 407-7455
Washington State Emergency Management	Oil and Hazardous Materials Spills	(800) 258-5990
State Wide One-Call	Utility Locates	(800) 424-5555
Town of Cathlamet Water Operations Superintendent Maintenance Maintenance Maintenance	Public Works Water Plant David McNally Jay Watson David Florek Troy Gorley	(360) 795-3203 (360) 795-3650 (360) 751-0257 (360) 751-4676 (360) 849-9759 (360) 849-9484
Wahkiakum County PUD	Dan Kay	(360) 795-3266
Washington State Department of Transportation	Bridges and Structures Office	(360) 705-7200
Gray & Osborne, Inc.	Olympia Office Seattle Office Vancouver Office	(360) 292-7481 (206) 284-0860 (360) 571-3350

EMERGENCY PROCEDURES

Contamination of Water Supply

Bacterial contamination of the water supply can result from such items as main breaks or pollution from an isolated source. Table 6-4 provides the appropriate action that will be taken in the event of the contamination of the water supply.

TABLE 6-4

Water System Contamination Response Actions

Distribution System Contamination
• Perform chemical and free chlorine residual analysis at various locations within the system, including the reservoirs and at system extremities.
• Disinfect distribution lines as dictated by the nature of the contamination.
Reservoir Contamination
• Isolate reservoir from system.
• Inspect vent screens, hatches, and piping to identify source of contamination.
• Resample to confirm contamination. Take multiple samples at different locations in reservoir, if possible.
• Check distribution system for presence of contamination.
• If reservoir water is contaminated and therefore considered unsuitable for consumption, drain and clean reservoir.
• Disinfect reservoir if bacteriological standards are exceeded. Follow AWWA Standards. A 50 ppm chlorine solution in the reservoir can be obtained by adding 97 gallons of 5.25 percent chlorine bleach per 100,000 gallons of storage.

Bacteriological Presence Detection Procedure

Public systems may occasionally experience detection of bacteriological contaminants. Such detections are typically the result of sample tap contamination or improper bacteriological sample collection procedures. However, bacterial contamination of water systems can result from such events as main breaks or pollution from an isolated source. The persistent detection of coliform bacteria in the supply, particularly *E.coli* or fecal coliform, may require the issuance of a public boil water notice to ensure the health and safety of customers is not compromised. Emergencies such as floods, earthquakes, and other disasters can result in damage to the system infrastructure, which may also warrant a boil water notice as a precautionary measure.

The Revised Total Coliform Rule only requires public notification within 24 hours when two related samples (a routine and one or more of its corresponding repeat samples) test positive for total coliform bacteria and there is *E.coli* bacteria in one or more of the samples. All customers should be notified through a boil water notice, a sample of which is provided in Appendix N. WAC 246-290-320 requires water utilities to follow specific procedures in the event coliform bacteria are detected in the water system. Refer to DOH publication 331-187 *Follow-up to an Unsatisfactory Routine Coliform Sample* in Appendix O for procedures to follow in the event of an unsatisfactory coliform test.

VOC/SOC and Inorganic Chemical/Physical Characteristics Detection Procedures

Volatile organic chemical (VOC) and synthetic organic chemical (SOC) samples are routinely taken from supply sources. VOC and SOC tests include numerous different chemicals. VOCs and SOCs are generally not detected in supply sources. Therefore, any detection of VOCs or SOCs may warrant follow-up investigation even if it does not exceed an MCL. If routine VOC or SOC samples detect one or more chemicals, additional samples may be taken specifically for that chemical or possibly for a surrogate such as Total Organic Carbon if it reduces follow-up chemical testing costs. Follow-up procedures in the event of VOC or SOC detection are specified in WAC 246-290-320 (6). Follow-up actions may vary depending upon the specific chemical detected and the level at which it is detected. The DOH area representative should be contacted to coordinate follow-up sampling and appropriate responses.

Power Failure

Various types of weather can cause a loss of power. These weather conditions include wind, lightning, freezing rain, or snowstorm. Additionally, power can be lost through traffic accidents.

In the event of a power outage, public works staff will first check reservoir levels visually. The possible length of the power outage will be estimated and customers will be notified of the emergency and water conservation will be requested through radio, television, newspaper and/or Sheriff's car loudspeaker.

Although power outages are not common in the Cathlamet area, they do occur occasionally. The water system relies on electrical power for treatment plant and booster pump station operation. If power is lost the distribution system will still operate on storage reserves. Storage reserves may last 2 to 3 days without replenishment, depending upon demands. The Greenwood Booster Pump Station is equipped with an emergency power connection, but the Town does not own a generator to power this station at this time. The Town would need to rent a trailer-mounted generator in an extended power outage. As stated earlier, the Town has an agreement with a local contractor to supply a trailer-mounted generator during times of emergency. This would also be necessary at the Water Treatment Plant until the permanent generator construction is finished in 2023.

Severe Earthquake

A major earthquake could destroy all water system structures such as the intake facility, treatment plant, reservoirs, transmission mains, and distribution mains. The contingency plan for such an event is to isolate problem areas with isolation valving in the short-term. Lines would be replaced once priorities were set by the Town. If reservoirs were lost, the Town would notify all customers of the situation by radio, telephone, newspapers, the local sheriff's car loudspeakers, special phone numbers, and even door to door, if necessary. Depending on the severity of the loss, such a notification would spell out specific water uses allowed during the event and would remain in effect until further notification.

Table 6-5 provides procedures to follow in the event of a severe earthquake.

TABLE 6-5

Severe Earthquake Response Actions

System Component	Proposed Actions
Reservoirs	• Observe structure for visual signs of structural damage • If structural damage is apparent, drain reservoir and inspect the interior, exterior and roof of the tank • If leakage is suspected, isolate reservoir and monitor water level
Distribution Lines	• Close valves to isolate breaks • Check reservoir level • Notify water customers of emergency and request water conservation
Raw Water Intake/ Treatment Plant	• Inspect raw water intake and treatment for operation

Cold Weather Conditions/Severe Snow Storm

Extended cold weather conditions could cause freezing problems at shallow service connections, valve vaults without an insulating earth cover, reservoirs, and water supply and treatment facilities. Heavy snowfall may impede employees from reaching a problem area. Water supply should not be interrupted because flowing water is used to prevent freezing. Table 6-6 addresses the possible emergency events and response actions that will be taken in the event of a severe snowstorm.

TABLE 6-6

Severe Freezing/Snowstorm Response Actions

System Component	Proposed Actions
Reservoirs	• Clear snow from roads and walkways
Distribution Lines	• Contact Wahkiakum County Public Works, Roads Division, to expedite plowing to any problem area • Have chains and snow gear ready for maintenance equipment and vehicles • Maintain mapping of valve locations to locate valves as needed • Frozen lines can be wrapped with heat tape
Raw Water Intake/ Treatment Plant	• Clear snow from Treatment Plant access road • Inspect water intake and treatment for operation

High Water and Flooding

Heavy snowmelt and/or rains can cause the water levels to rise and reach a flood level. Puget Island and areas along the Elochoman River, including the water treatment plant are susceptible to flooding. The most vulnerable water system components include floodwater entering into the treatment plant clearwell and silting up of the river intake structure. If portions of the Town system became significantly inundated, the area can be valved off to prevent contamination. Customers as well as the Fire Department would be notified in advance of any shut down. If any portion of the system were shutdown, that portion would need to be drained and disinfected prior to being put back into service. Table 6-7 addresses the possible emergency events and response actions that will be taken in the event of high water or flooding.

TABLE 6-7

High Water/Flooding Emergency Response Actions

System Component	Proposed Actions
Reservoirs	• No action should be required as reservoirs are above flood level
Distribution Lines	• Test for coliform bacteria
Raw Water Intake/ Treatment Plant	• Inspect raw water intake and treatment plant for operation • Test for coliform bacteria

CROSS-CONNECTION CONTROL PROGRAM

A Cross-Connection Control Program is another element of the Town’s water system developed to ensure safe reliable water for its customers. The program’s goal is to prevent backflow of contaminated water into the system during low pressure occurrences or other water system abnormalities. The backbone of the program is the Town ordinance 550-12, which allows the Town to eliminate cross-connections or require installation of an approved backflow prevention assembly to protect the public potable water system. Sites and components subject to cross-connection are selected based upon potential risk. An effective cross-connection program will have and ordinance, program construction standards, public notification and a program for existing cross-connections, operation and maintenance program, documentation and record keeping of results and operator certification and training.

The Town of Cathlamet’s cross-connection control regulations are located in Chapter 13.50 of the Town’s Municipal Code which was last updated in March of 2022. A copy of Chapter 13.50 is located in Appendix F.

PRIORITY SERVICE LIST

The Town of Cathlamet reviews the types of uses and determines the degree of hazard based on the Cross-Connection Control Manual.

NEW AND EXISTING CROSS-CONNECTION DEVICES

As of 2022, the Town currently has approximately 25 cross-connection control devices located within the water system. New and existing cross-connection control devices are evaluated and catalogued initially by the Town's Cross-Connection Control Specialist (CCS). It is the responsibility of the customer to ensure proper backflow assembly testing (BAT) of the devices on an annual basis thereafter and submit documentation of testing to the Town. Backflow prevention devices are required on all new cross-connections. New services are required to have an evaluation by the Town's Cross-Connection Control Specialist to determine what type of backflow device is needed.

CROSS-CONNECTION CONTROL PROGRAM RECORD KEEPING

A critical program element of a Cross-Connection Control Program is the maintenance of accurate records. A Cross-Connection file has been developed and is kept at the Town Hall by the Cross-Connection Control Specialist. This person is responsible for updating the file as new sites are identified and backflow assemblies are installed. The file has a summary sheet identifying all sites that have backflow devices and the devices status. Each site has a separate file for the inspection report, manufacturer's data and other information of actual installation, a sketch of the installation showing the location within the building or at the site, a copy of the annual maintenance reports and any other correspondence between the Town and the customer regarding the cross-connection program.

PROGRAM SCHEDULING AND PERSONNEL REQUIREMENTS

Inspection and testing of the cross-connection control devices is done by independent private contractors and paid for by the service customer. Maintenance of backflow testing equipment is the sole responsibility of the BAT contractor. However, the Town maintains staff with the required CCS and BAT certifications. This person maintains state certification as a Cross-Connection-Control Specialist. Currently, Water System Maintenance Worker, Terry Vik is certified and is on-call and responsible for implementation of the program. The Town is currently in the process of certifying a new Cross-Connection-Control Specialist.

CROSS-CONNECTION CONTROL CUSTOMER EDUCATION

The Town reminds its water customers of the need for cross-connection control through annual bill inserts.

CUSTOMER COMPLAINT RESPONSE PROGRAM

The Town of Cathlamet has a form that customers can use to make formal complaints. The form is available at Town Hall from the Clerk. The Town will develop a written procedure for handling complaints. The procedure will involve all billing complaints being handled by the Town Clerk. The complaint will be verbally responded to and a note of the response will be made on the complaint response form and kept on file at Town Hall. Similarly for water quantity, pressure and quality complaints, the complaint form will be passed on to the Water System Supervisor for response. If the customer is not satisfied with the response, the complaint will need to be taken to the Mayor and Town Council at the next Council meeting.

RECORD KEEPING AND REPORTING

The Public Works Superintendent keeps Town records for water quality and the monthly treatment plant reports in files at the treatment plant. Records are maintained for all water quality tests, treatment plant monthly reports and all correspondence with DOH. The water quality records for bacteriological and turbidity shall be maintained for at least five years. Chemical results shall be kept as long as the system is in operation. Records of operation and analyses required by DOH shall be maintained for three years. Records of customer use by class, treatment plant production, and water loss calculations shall be maintained for 6 years. Construction documents, project reports, water right documents and any DOH approvals shall be maintained for the life of the system.

SANITARY SURVEY FINDINGS

Every three to five years, DOH completes a sanitary survey on the water system to identify significant deficiencies, significant findings, and observations. This most recently took place in August of 2019 and one significant deficiency and four significant findings were found. The significant deficiency and findings were corrected by the Town by November of 2019. A copy of the sanitary survey letter can be found in Appendix P.

OPERATIONS PROGRAM SUMMARY

Operation of the Town of Cathlamet water system is the responsibility of the Public Works Department. This is a small department that is also responsible for the other public works areas. The Town has qualified personnel to operate and maintain the water system. The Town will need to support these people in maintaining their certifications through continual training programs as required by the certifying organization.

Routine and preventive maintenance requires substantial labor. Maintenance at the water treatment plant and booster pump station are a priority for the operators. Other routine and preventive maintenance items, such as valve exercising and meter testing can get neglected due to other more immediate needs such as system repairs for all the public works entities. The Town will review and discuss options for making additional time available for routine and preventive maintenance duties. This will give the staff an opportunity to foresee problems before they become emergencies.

CHAPTER 7

DISTRIBUTION FACILITIES
DESIGN AND CONSTRUCTION STANDARDS

OBJECTIVE

The objective of this chapter is to document the Town of Cathlamet's design and construction standards to allow the Town to obtain DOH approval to utilize the alternative review process for construction of new and replaced water distribution facilities. Through this process, a purveyor needs no further approval from DOH for distribution project reports, construction documents, or installation of distribution mains, pipe linings, and tank coatings.

This chapter includes the following elements:

- System Standards, Policies and Procedures
- Project Review Procedures
- Design and Construction Standards
- Construction Certification and Follow-up Procedures

The Town's Water System Standards (Standards) are located in Appendix D.

SYSTEM STANDARDS, POLICIES AND PROCEDURES

The Town has developed a Water System Standards document to govern any improvements within the public right-of-way and/or public easements, all improvements required within the proposed right-of-way of new subdivisions and for all improvements intended for maintenance by the Town.

PROJECT REVIEW PROCEDURES

Project review procedures vary with the level of complexity of the anticipated project. In general, distribution projects identified in a Water System Plan do not require DOH review. Any distribution projects beyond those identified will require DOH review and approval.

The Town Council and the Town's consulting engineer shall review all distribution improvements and replacements during the design phase. This review will be to ensure the project is in compliance with the Town's Standards. During construction, the Town's personnel will make site visits to ensure the project is constructed in accordance with the specifications. Any changes from the Town's Water System Standards will require written approval from the Town Council. A Construction Completion Report Form shall be submitted to the Town Council and the DOH within 60 days of completion and prior to use of the installation. The report shall state that the project was constructed in accordance with the plans and specifications.

Connection of additional water customers will be requested on an on-going basis as the Town grows. Reviews for new customers will be done through the Town's water service application process. The Town Council, Public Works Superintendent, and Cross-Connection Control Specialist will be involved in the review process. The Town Council's review will ensure the proposed services remain consistent with the planning goals of the Town. The Public Works Superintendent will review the application for water availability according to the system's Operating Permit, the need for any possible water main extensions, and to ensure anticipated water use is consistent with water system guidelines. The Cross-Connection Control Specialist will review the application for water use and the potential for cross-connections. Prior to the construction of the service connection, the Specialist will review the backflow prevention assembly installation for compliance with Cross-Connection requirements.

DESIGN AND CONSTRUCTION STANDARDS

Water facilities are to be designed and constructed in accordance with the design standards in Chapter 3 of this Water System Plan and the Town of Cathlamet Water System Standards that are included in Appendix D. These standards must be followed for any water facility design and construction project.

CONSTRUCTION CERTIFICATION AND FOLLOW-UP PROCEDURES

During the construction of any water facility, the Town shall have a representative make periodic inspections. The representative will report progress and any variance from the construction documents to the consulting engineer responsible for construction management. Additionally, the representative should be present for all pressure tests, disinfection procedures, and water quality sampling as defined in the Standards. In the future, the Town may want to consider requiring the developer to hire an on-site representative to be present a minimum of four hours per day in addition to the testing and disinfection procedures.

Upon completion of the project, the consulting engineer responsible for construction management shall complete a Construction Completion Report Form and submit it to DOH. This form is the Engineer's certification that the project was completed in conformance with the plans, specifications, and Town Standards. Additionally, the construction manager shall prepare record drawings to submit to the Town for their project files.

CHAPTER 8

CAPITAL IMPROVEMENT PROGRAM

OBJECTIVE

This chapter presents the Capital Improvement Program (CIP) for the 10- and 20-year planning periods. Recommended water system improvements and associated costs, along with scheduling information is presented in the following sections according to analyses, identified deficiencies, and recommendations identified in Chapter 3 of this plan. For the proposed projects identified in this chapter, preliminary cost estimates are provided in Appendix Q. The project costs are preliminary estimates and are in 2022 dollars and includes predesign, design, permitting, construction, and construction administration costs unless otherwise noted.

Projects that are in progress or completed since the 2015 Water System Plan are shown in Table 8-1.

TABLE 8-1

Capital Improvement Progress Since 2015

Title	Year Scheduled	Year Completed
Water Treatment Plant Interim Intake Modifications	2016	2016
Main Street Water Main Break Repair	-	2018
Columbia Street Water Main Improvements	2020	2021
WTP Generator	2023	In Progress
Boege Road PRV Stations	2023	In Design

CAPITAL IMPROVEMENTS

SOURCE IMPROVEMENTS

As shown in Chapter 3, the Town has adequate water rights to meet all current and projected demands. However, the raw water intake in the Elochoman River does not have adequate capacity to meet projected maximum day demands by 2027.

According to observations and discussions with Town staff, it is suspected that part of the intake structure may be partially obstructed by sediment from the river. Backwashing the infiltration pipe with air blowers only proves partially useful, which leads the Town to believe some other obstruction between the air line and the raw water wet well may be limiting the intake capacity. A thorough cleaning and inspection of the intake is recommended as a short-term solution to increase capacity. However, a long-term solution is still recommended as well.

Since the Elochoman River is the sole water source for the Town, and subject to periods of high turbidity in winter and low flow in summer, the Town is investigating alternative sources to increase reliability in both quality and quantity. The Town's total water rights, which include surface water rights for the Elochoman River, Cougar Creek, and Abe Creek are sufficient to meet the Town's demand during the 20-year planning period. However, Cougar and Abe Creeks are not developed sufficiently to currently utilize them as potable water sources. The Town has previously investigated a number of options including utilizing the creeks for non-potable uses, particularly during the summer season, thereby reducing the summer season withdrawal from the Elochoman River. All options to utilize the creeks as sources would require construction of significant infrastructure.

Another possibility the Town has discussed with the Washington Department of Ecology is transferring a portion of the water rights from the above creeks to a groundwater source. Ideally, this source would be located upstream of the WTP within the Elochoman River valley. Provided water quality from this groundwater source meets state drinking water standards, the water could be pumped directly into the distribution system. A number of small test wells were installed as part of an unrelated hydrogeologic investigation, which indicated groundwater in the area under artesian pressure. Further investigation will be necessary to ascertain quantities and quality available.

However, Ecology has indicated that there may be water right issues that limit the Town's ability to transfer these rights to another location. A groundwater source would reduce impacts to protected salmonids in the Elochoman River associated with summer low flow and would increase reliability of the Town's source of supply. No further progress has been made on the effort to transfer water rights since 2008. Should the Town decide to pursue a change in water rights, the Town will also evaluate the feasibility of developing the Abe and Cougar Creek sources as either potable or non-potable sources. The Town has also begun to engage in talks with Wahkiakum PUD about a possible joint project to develop a well on Puget Island that could provide an additional source that would benefit both the Town and the Puget Island Water System. The development of a new well on Puget Island would require the construction of a storage tank, booster pump station, and transmission main to convey the water to both systems. This would be a long term investment into both systems.

Source projects are identified below.

SO-1: Improve Raw Water Intake
Estimated Cost: $100,000

Pumping tests performed by the Town in 2022 indicate the raw water intake has a maximum capacity of about 450 gpm (648,000 gpd). A secondary surface intake was constructed in 2016, however it does not benefit the treatment plant during extreme low river levels in the summer. This intake could be lowered or modified to allow it to collect more water year-round. This project is scheduled for 2024 because under current projections, unless the Town drastically reduces system-wide DSL and/or maximum day demand, demands will exceed the raw water intake capacity by 2027.

SO-2: Replace Raw Water Infiltration Gallery
Estimated Cost: $1,000,000

The preliminary cost estimate for this project is $1,000,000. This project is scheduled for the 10-year CIP if project SO-1 is completed in the near future. It will likely take approximately 1 to 2 years to design and permit these improvements.

SO-3(a): Transfer or Change Water Rights
Estimated Cost: $20,000

The town currently has a single source of supply, the surface water intake at the Elochoman River. Utilizing a groundwater source would require a transfer or change of the Town's existing water rights since the Elochoman watershed basin is closed to any new appropriations. One other possibility is the purchase of existing groundwater water rights from willing sellers. Additional investigation will be necessary to determine if a transfer, change, or purchase is feasible. The investigation might include the Town conducting a detailed hydrogeologic investigation followed by the subsequent drilling of test wells, and finally the drilling and equipping of production wells. The estimated cost of initiating a water right transfer or change is $20,000. Purchase of a groundwater right is contingent on the availability of water rights for sale in the basin and the actual cost of the right if available. The costs associated for this project do not include design, permitting, construction, or construction administration.

SO-3(b): Detailed Hydrogeologic Investigation
Estimated Cost: $30,000

Conduct a detailed hydrogeologic investigation within a half-mile to either side and the terminal end of the proposed pipeline upstream of the WTP in the Elochoman River valley. The estimated cost of a detailed hydrogeologic investigation is $30,000. The costs associated for this project do not include permitting, construction, or construction administration.

SO-3(c): Drill Test Well
Estimated Cost: $300,000

Following the hydrogeologic investigation and a suitable location(s) determined, complete a test well for a possible production well. The test well will include the services of a hydrogeologist, preliminary investigation and report, 8-inch-diameter test well, pumping tests, and water quality sampling.

SO-3(d): Drill and Equip Production Well
Estimated Cost: $1,100,000

Provided the test well yields adequate results for water quantity and quality for production capacity, a production well will be drilled and equipped. In addition to the well, a transmission main will be required to transport the water from the wellhead to the distribution system or reservoir. The estimated cost for this project includes equipping the well, pump house (if necessary), and transmission main to connect to the system. Since many of these items are dependent upon the outcome of the detailed hydrogeologic investigation the estimate provided is planning level only.

SO-4: Surface Water Diversion/Satellite Water Treatment Plant Feasibility Study
Estimated Cost: $50,000

In addition to the Elochoman River, the existing water rights held by the Town of Cathlamet include the surface water sources of Cougar and Abe Creeks, which are currently not developed. The report would study the feasibility of the project, which would consist of construction of a diversion structure at each source, a common raw water transmission main, a small filtration plant, and distribution main connecting to the existing system.

The estimated cost of the Feasibility Study for this project is $50,000. The costs associated for this project do not include permitting, construction, or construction administration. Following the Feasibility Study, a pilot study would be required, followed by detailed design, plans, and specifications for the project at an estimated cost of $500,000.

The location of the filtration plant is dependent upon the availability of power, site access, and construction easements for the transmission main from the diversions, and the intercept to the distribution system. Water treatment would likely be provided by a Conventional or Membrane Package Plant sized to meet the water rights for those sources, which equates to approximately 0.65 mgd. A Predesign Report would be required to determine the treatment process, raw water quality analysis, and siting locations. Prior to the Predesign Report, the overall cost of this project is highly speculative, but would likely exceed $4,000,000.

Another alternative to be investigated in the Predesign Report would include the use of these sources for the Town's non-potable water requirements such as irrigation at the ball fields, High School, golf course, and Crista Vista development. This could eliminate the need for treatment. It would also reduce demand at the existing WTP during the summer when low flows in the Elochoman River are typically experienced, thereby providing more water for potable uses. The estimated cost of developing these sources as non-potable sources ranges from $1,000,000 to $3,000,000.

TREATMENT IMPROVEMENTS

The following projects are recommended for the Town's treatment facilities:

WT-1: Install WTP Emergency Generator
Estimated Cost: $176,000

Install a 150 kW generator at the WTP to improve reliability of the system during a power outage. This project is projected currently being constructed and will allow the Town to have its own emergency capabilities and be able to recover the system more quickly during power outages. The costs associated for this project do not include predesign, design, or permitting.

WT-2: Replace Finish Water Pumps
Estimated Cost: $60,000

Replace the two existing 300-gpm finish water pumps with two 350-gpm pumps. This project is included in the 10-year CIP because it is necessary to maximize the treatment plant capacity of 700 gpm.

STORAGE IMPROVEMENTS

As discussed in Chapter 3 of this Plan, the existing distribution system is capable of meeting fire flow requirements in the Town's system, with the exception of a few locations in the downtown area. Hydrant testing and fire flow modeling indicate that required fire flow of 1,500 gpm for industrial/commercial areas cannot currently be achieved in the downtown area along 2nd Street, and one hydrant near the elementary school.

S-1: New 530,000-Gallon Reservoir
Estimated Cost: $4,200,000

Construct a new 530,000-gallon glass lined, bolted steel reservoir adjacent to the existing Kent's Bridge Reservoir. At currently projected demands, the Town is expected to need additional storage capacity by 2037. Kent's Bridge Reservoir site is the ideal location for a new tank because the location has adequate land and the location would allow water to be conveyed to most of the system by gravity, through cascading PRVs.

DISTRIBUTION SYSTEM IMPROVEMENTS

Distribution system deficiencies were identified and improvements were recommended in Chapter 3. Distribution improvements are classified into three major categories: Repair/Replacement, Hydraulic Improvements, and Water Main Extensions. All distribution system improvements will be designed to meet fire flow requirements.

Lengths of water mains to be replaced were estimated from GIS base maps. Actual lengths required may vary when design surveys are performed. Following are the recommended distribution system improvements:

D-1: Boege Road PRV Stations
Estimated Cost: $295,500

Install two new Pressure Reducing Valve (PRV) stations near the intersection of State Route 4 and Boege Road and adjust the settings of the existing Boege Road PRV. This project is currently under design and is scheduled to begin construction in 2023. The project will increase service pressures in the southeastern end of the system without adversely increasing pressures on the west side of the existing Pressure Zone 2.

D-2: Valve and Hydrant Replacement Program
Estimated Cost: $15,000/year

According to operations staff, the Town currently has an abundance of old and aging valves and hydrants. To combat the increased cost of maintenance and replacement of broken valves and hydrants, the Town is pursuing to replace old and aging valves and hydrants with a budget of $15,000 per year.

D-3: 2nd Street Main Replacement
Estimated Cost: $380,000

Replace an estimated 800 linear feet of 4-inch (AC) water main with 8-inch (PVC) water main along 2nd Street from the marina at end of 2nd Street to Una Avenue. This project is projected to begin construction in 2024. This project will increase fire flow availability to the industrial/commercial area along 2nd Street and near the marina.

D-4: Maple Street Extension
Estimated Cost: $100,000

Replace an estimated 500 linear feet of 6-inch fiberglass wrapped PVC water main with 8-inch (PVC) water main from the corner of Maple Street and South 3rd Street to Wahkiakum Middle/Elementary School, to increase fire flow availability.

D-5: Jacobson Road Water Main Improvements
Estimated Cost: $100,000

Wahkiakum County has discussed plans to replace a section of Jacobson Road from SR 4 to Columbia Street. This gives the City an opportunity to upsize the current 6-inch water main with 8-inch (PVC) water main to increase fire flow availability. This improvement would include upsizing approximately 1,700 feet of water main and is placed in the 20-year improvements due to the county not having a defined start date for the project.

DELEVLOPER EXTENSIONS

The Town will not incur any costs associated with developer extensions.

DE-1: Front Street Main Replacement
Estimated Cost: $304,000

Replace an estimated 1,240 linear feet of 6-inch (AC) water main with 8-inch (PVC) water main along Front Street from River Street to the Julia Butler Hansen Bridge. This project is included in the 20-year CIP to increase fire flow availability.

DE-2: Greenwood Road Main Replacement
Estimated Cost: $320,000

Replace an estimated 1,350 linear feet of 6-inch (AC) water main with 8-inch (PVC) water main along Greenwood Road from Cedar Lane to Mattie Street to increase fire flow availability.

DE-3: Greenwood Reservoir Main Extension
Estimated Cost: $270,000

Install an estimated 1,200 linear feet of 8-inch water main connecting the main on Greenwood Road south of the Greenwood Reservoir and Morgan Drive. This area will need to be served from the PRV that supplies water from Pressure Zone 4 to Pressure Zone 5. This project will be financed as a developer extension when development occurs in that area. The Town will maintain the water line once it is accepted as complete. The cost estimate for this improvement is $270,000.

DE-4: Crista Vista Main Extension
Estimated Cost: $881,000

Install an estimated 4,200 linear feet of 8-inch (PVC) water main from Clover Street east then south to the intercept with the water main on State Route 4 in order to connect the Crista Vista Water System. This project would likely be developer financed.

DE-5: Upper Elochoman Valley Road Main Extension
Estimated Cost: $1,380,000

Install up to an estimated 7,500 linear feet of 8-inch (PVC) water main from the Water Treatment Plant northeast up the Elochoman Valley Road. The project route would parallel the highway and connect to the proposed new reservoir. In addition, pending the outcome of a hydrogeological investigation and water right transfer, this new water main could also connect the water system to a new groundwater source. The estimated cost of the 7,500 linear feet of water main is $1,380,000. Estimated costs of the new reservoir and groundwater source projects are described above.

DE-6: Una Avenue Main Replacement
Estimated Cost: $155,000

Replace an estimated 600 linear feet of 4-inch (AC) water main with 8-inch (PVC) water main along Una Avenue from 3rd Street to Butler Street to increase fire flow availability.

TELEMETRY AND CONTROL SYSTEM IMPROVEMENTS

T-1: SCADA Control System
Estimated Cost: $200,000

As described in Chapter 3, the existing telemetry and control system requires the operator to spend significant amounts of time at the WTP and the Town has reported occasional signal blackout between the WTP and the reservoirs. The existing system is old, and maintenance and repair of the system will become more of a problem over time. Modern control systems provide better system information and control capabilities. The Town is planning on replacing the existing control system with a more reliable system.

CONSERVATION MEASURES

LD-1: Leak Detection and Repair Program
Estimated Cost: $10,000 Every 3 Years

The Town will pursue a regular leak detection and repair program. The annual cost of leak detection and repair may vary in reality; however, for planning and budgeting purposes the Town will allocate $10,000 every 3 years to leak detection and repair.

PLANNING

P-1: Water System Plan
Estimated Cost: $75,000

Water System Plans are required to be updated every 10 years. The amount budgeted for the next Plan is $75,000 to begin in year 2033.

CAPITAL IMPROVEMENT SCHEDULE

The summary of estimated costs below are in 2022 dollars. The total estimated cost of all recommended capital improvements is $8,964,500, not including developer extensions.

- Source of supply improvements are estimated to cost $2,600,000.
- Water Treatment Plant improvements are estimated to cost $236,000.
- Water storage improvements are estimated to cost $4,200,000.
- Distribution system improvements are estimated to cost $1,583,500.
- Developer extension expenditures are estimated to cost $3,310,000. These will most likely be financed by the developer.
- Telemetry system improvements are estimated to cost $200,000.
- Other capital improvements such as leak detection and water system plan updates are estimated to cost an additional $135,000.

The 10-year capital improvements total $2,566,500. In 2021, the Town served an average of 673 active metered services, serving a total of 822 ERUs (not counting DSL or the intertie with Puget Island). The Town's cost of the 10-year recommended capital improvements constitute a cost of $3,814 per metered connection, or $3,122 per ERU served.

The 20-year capital improvement plan includes those projects to be completed from year 10 through year 20. Many of these projects will be developer financed if they are to be completed. The balance of total project costs from year 10 to year 20 is $6,388,000, not including developer extensions.

The capital improvements identified above are indicated on Figure 8-1. A prioritization schedule and cost summary for the recommended 10- and 20-year Town/developer funded improvements are shown in Table 8-2 and assumes an inflation rate of 4 percent.

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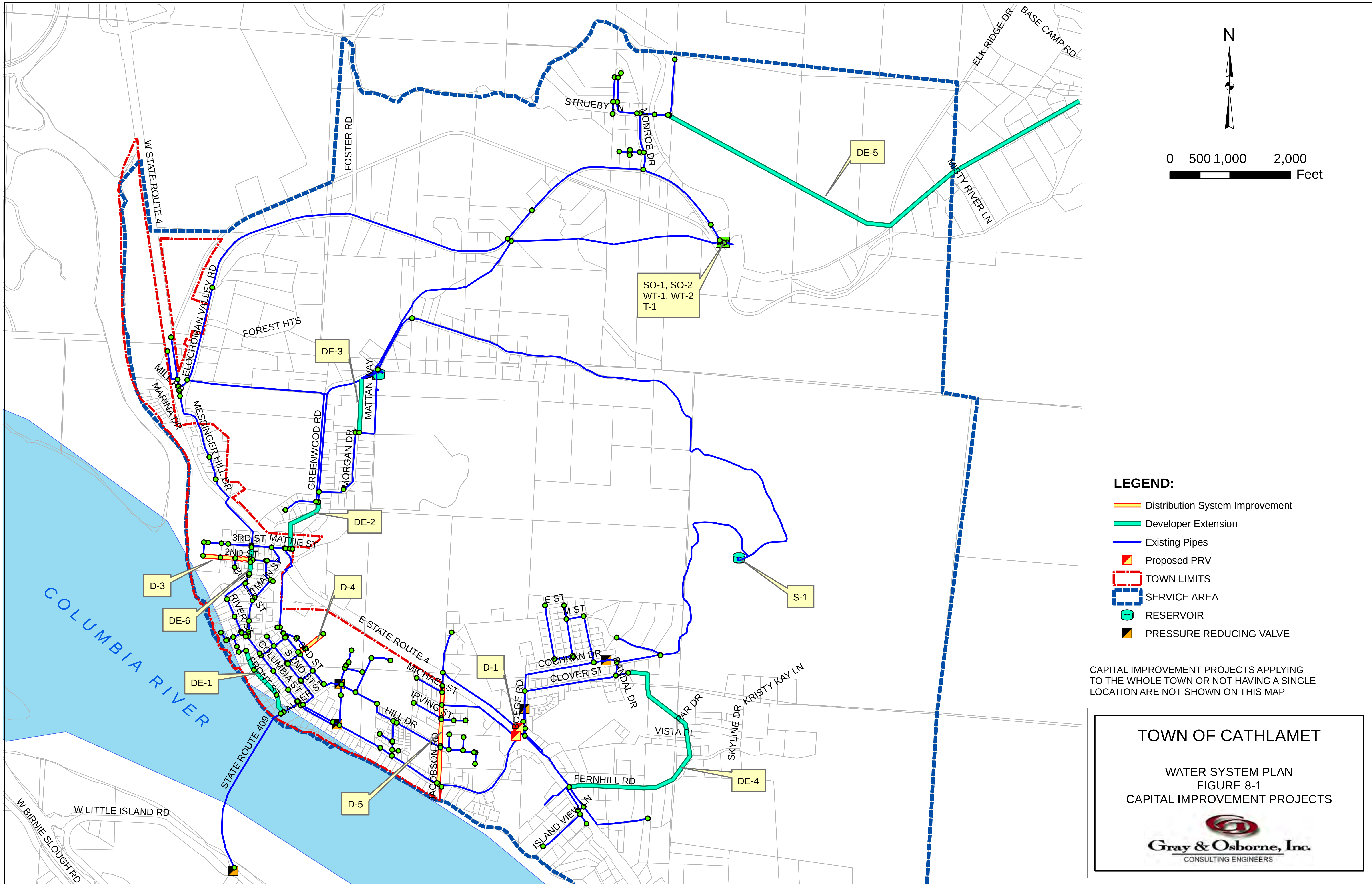

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TABLE 8-2

Capital Improvement Schedule

No.	Project Title	Total Cost(1)	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034-2043
Source														
SO-1	Improve Raw Water Intake	$100,000		$108,200										
SO-2	Replace Raw Water Infiltration Gallery	$1,000,000							$1,316,000					
SO-3(a)	Transfer or Change Water Rights	$20,000												$20,000(2)
SO-3(b)	Detailed Hydrogeologic Investigation	$30,000												$30,000(2)
SO-3(c)	Drill Test Well	$300,000												$300,000(2)
SO-3(d)	Drill and Equip Production Well	$1,100,000												$1,100,000(2)
SO-4	Surface Water Diversion and Satellite Water Treatment Plant Feasibility Study	$50,000												$50,000(2)
Water Treatment Plant														
WT-1	Install WTP Generator	$176,000	$183,000											
WT-2	Replace Finish Water Pumps	$60,000			$67,500									
Distribution System														
D-1	Boege Road PRV Stations	$295,500	$307,300											
D-2	Miscellaneous Valve Replacement and Installation	$300,000	$15,000	$16,200	$16,900	$17,500	$18,200	$19,000	$19,700	$20,500	$21,300	$22,200	$23,100	$288,400
D-3	2nd Street Main Replacement	$380,000		$411,000										
D-4	Maple Street Extension	$100,000									$142,300			
D-5	Jacobson Street Replacement	$508,000												$508,000(2)
Developer Extensions														
DE-1	Front Street Main Replacement	$304,000(3)												
DE-2	Greenwood Road Main Replacement	$320,000(3)												
DE-3	Greenwood Reservoir Main Extension	$270,000(3)												
DE-4	Crista Vista Main Extension	$881,000(3)												
DE-5	Upper Elochoman Valley Road Main Extension	$1,380,000(3)												
DE-6	Una Ave Main Replacement	$155,000(3)												
Storage														
S-1	New 530,000 Gallon Reservoir	$4,200,000												$4,200,000(2)
Telemetry and Control System														
T-1	SCADA Control System	$200,000					$243,300							
Conservation Measures														
LD-1	Leak Detection and Repair Program	$60,000			$11,200			$12,700			$14,200			$54,300
Planning														
P-1	Water System Plan Update	$75,000											$115,500	
Total		**$8,446,500**	**$505,300**	**$535,400**	**$95,600**	**$17,500**	**$261,500**	**$31,700**	**$1,335,700**	**$20,500**	**$177,800**	**$22,200**	**$138,600**	**$6,042,700**

(1) Costs are in 2022 dollars.
(2) Inflation is not included due to the construction year being unknown.
(3) The Town will not incur any costs associated with developer extensions.

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ANALYSIS

A useful metric to assess whether a utility's capital expenditures are adequate to maintain the utility's current level of service long-term is to compare the utility's average annual Capital Improvement Program budget to the total annualized replacement cost of the utility's assets. The total annualized replacement cost is defined as the cost of each asset divided by the expected useful life of that asset, summed for all assets. It is representative of the rate at which the utility's assets are declining in value (in dollars per year), assuming straight-line depreciation. If the utility is spending approximately as much every year on capital improvement projects as the rate at which its assets are declining in value (in dollars per year), the utility can reasonably be expected to maintain its current level of service, assuming that its capital spending is primarily focused on renewal of existing infrastructure. If it is spending significantly less, the utility's level of service could be expected to decline over time, and if it is spending significantly more, the utility's level of service could be expected to improve over time.

As shown in Table 3-28, the total estimated replacement cost in 2022 dollars of the Town's major water system assets is $31,057,150, and the corresponding total annualized replacement cost of those assets is about $553,593. From Table 8-2, the amount the Town plans to spend on capital improvement projects over the 10-year planning period (2023 to 2033) is $2,566,500, or an average of about $256,650 per year. This planned level of spending is less than the water system's annualized replacement cost, so it can be concluded that the Town is likely not investing sufficient resources in its Capital Improvement Program to maintain or improve its current level of service. For this reason, it is recommended that the Town conduct a rate study to analyze how they may better plan for financial viability into the future. Financial analysis for the water utility is provided in Chapter 9.

CHAPTER 9

FINANCIAL PROGRAM

OBJECTIVE

The objective of this chapter is to analyze the Town's total costs of providing water service, review the current rate structure to ensure that the current or proposed adjusted rates are adequate to cover the costs of operation and maintenance, and ascertain the Town's financial capability to implement the 10-Year Capital Improvement Plan as outlined in Chapter 8.

PAST AND PRESENT FINANCIAL STATUS

This section reviews historic revenues and expenses, and current Town of Cathlamet rates. The fund is operated on a balance budget at the end of the year. Projects identified in the yearly budgets are permitted only as funds are available.

WATER RATES

The Town adopted water rates through Ordinance 662-22, which are included in Chapter 13 of the Town of Cathlamet Municipal Code (Appendix F). Water rates for 2022 are summarized in Table 9-1.

TABLE 9-1

Town of Cathlamet 2022 Water Rates

Meter Size	In-Town Base Rate (\$/month)(1)	In-Town Usage Rate (\$/100cf)(2)	Out-of Town Base Rate (\$/month)(1)	Out-of-Town Usage Rate (\$/100cf)(2)
5/8 inch	\$38.76	\$2.65	\$56.87	\$3.55
3/4 inch	\$45.85	\$2.65	\$70.97	\$3.55
1 inch	\$61.45	\$2.65	\$88.96	\$3.55
1-1/2 inch	\$81.68	\$2.65	\$117.52	\$3.55
2 inch	\$104.41	\$2.65	\$149.61	\$3.55
3 inch	\$138.57	\$2.65	\$196.45	\$3.55
4 inch	\$181.49	\$2.65	\$258.38	\$3.55

(1) Monthly minimum charge. Up to 350 cubic feet of water per month.
(2) Per 100 cubic feet for water consumed that exceeds 350 cubic feet in any one month.

In addition to the above fees, the Town, charges a water hookup fee for new construction, which is \$3,000 plus cost of installation within the corporate limits of the Town and \$5,000 plus cost of installation outside Town limits.

The Town has a minimum charge for multiple-family dwelling units using only one meter. The minimum charge per month is as follows: billed as a 5/8-inch meter for single-family, 3/4–inch meter for two to three dwelling units, 1-inch meter for four to six dwelling units, 1-1/2-inch meter for 7 to 10 dwelling units, 2-inch meter for 11 to 20 dwelling units, 3-inch meter for 21 units and up, and 4-inch meter for schools.

HISTORIC REVENUES AND EXPENSES

Historic revenues are summarized in Table 9-2.

TABLE 9-2

Summary of Historical Water Revenues

Description	2020	2021	2022
Water Taxes	$37,778	$39,078	$40,078
Intergov. Revenues	$2,088	$-	$3,607
Water Sales	$625,523	$651,230	$655,004
Late Fees	$2,601	$2,789	$9,242
Connections	$36,360	$93,902	$64,000
Investment Interest	$4,296	$1,029	$21,776
Miscellaneous Revenue	$17,007	$25,944	$15,986
Water DOC Loan (PC-20)	$607,388	$-	$-
Loan PC20-96103-045	$9,474	$76,679	$-
Loan PC20-96103-045 Retainage	$23,846	$2,839	$-
Total Water Revenues	**$1,366,361**	**$893,490**	**$809,693**

Historic Expenses are summarized in Table 9-3. These records were provided by the Town.

TABLE 9-3

Summary of Historical Water Expenses

Description	2020	2021	2022
Salaries, Wages, and Benefits	$190,704	$278,863	$281,604
Training/Education	$1,798	$926	$1,558
Professional Services	$11,692	$11,116	$10,888
Water Information Tech	$6,261	$4,482	$6,293
Repairs/Maintenance/Testing	$6,001	$10,614	$8,683
Supplies(1)	$18,956	$36,377	$72,927
Fuel	$3,365	$1,853	$2,834
Rentals, Leases, and Permits	$9,201	$8,303	$6,537

TABLE 9-3 – (continued)

Summary of Historical Water Expenses

Description	2020	2021	2022
Utilities	$42,705	$49,648	$37,687
Communications	$12,745	$8,770	$9,363
Advertising	$935	$161	$-
Insurance	$22,539	$22,104	$20,263
Taxes(2)	$73,294	$84,189	$75,084
Audit Costs	$5,852	$-	$5,375
Capital Improvements	$745,852	$56,734	$199,115
Loan Repayments	$68,092	$99,901	$99,366
Misc.(3)	$646	$4,507	$6,530
Total Water Expenses	**$1,220,636**	**$678,545**	**$844,109**

(1) Includes Water Plant chemicals and supplies, Water Distribution supplies, maintenance parts, and uniforms.
(2) Includes B&O Tax, Water Utility Tax, and Water Excise Tax.
(3) Includes Water vehicle services and other misc. costs.

Based on the calculated revenues and expenses in Tables 9-2 and 9-3, the Cathlamet Water Utility cash flow is summarized in Table 9-4.

TABLE 9-4

Summary of Historical Cathlamet Water Fund Cash Flow

Description	2020	2021	2022
Beginning Fund Balance	$781,169	$926,894	$1,141,839
Total Revenues	$1,366,361	$893,490	$809,693
Total Expenses	$1,220,636	$678,545	$844,109
Ending Fund Balance	**$926,894**	**$1,141,839**	**$1,107,423**

PROJECTED REVENUES AND EXPENDITURES

Table 9-5 shows projected revenues and expenditures. Revenue from water taxes, water sales, late fees, connection charges, and miscellaneous revenues are projected to increase by the 2.3 percent system growth rate. Investment interest is projected to remain constant. Investment income would increase if invested reserves increase and decrease if invested reserves decrease. With proposed capital improvements, capital reserves will be projected to remain steady, so investment income will also be projected to remain steady.

All expenses are projected to increase at an estimated 4 percent annual inflation rate, except for loan repayments. Loan repayments are not expected to increase. Expenses for utilities are also projected to increase by an additional 2.3 percent system growth rate to reflect additional costs associated with a growing system.

Additionally, to fund the projects presented in the 10-year CIP and to grow the Town's water capital reserve fund it is assumed that the water system will increase rates, matching the estimated inflation rate, at four percent annually.

TABLE 9-5

Projected Revenues and Expenditures

	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033
Revenues											
Water Taxes[1]	$40,999.34	$41,942.33	$42,907.00	$43,893.86	$44,903.42	$45,936.20	$46,992.73	$48,073.57	$49,179.26	$50,310.38	$51,467.52
Water Sales[1]	$670,069.47	$712,283.85	$757,157.73	$804,858.67	$855,564.76	$909,465.34	$930,383.05	$951,781.86	$973,672.84	$996,067.31	$1,018,976.86
Rate Increase[2]	$26,802.78	$28,491.35	$30,286.31	$32,194.35	$34,222.59	$36,378.61	$37,215.32	$38,071.27	$38,946.91	$39,842.69	$40,759.07
Late Fees[1]	$9,454.76	$9,672.22	$9,894.68	$10,122.26	$10,355.07	$10,593.24	$10,836.88	$11,086.13	$11,341.11	$11,601.96	$11,868.80
Connections[1]	$65,472.00	$66,977.86	$68,518.35	$70,094.27	$71,706.44	$73,355.68	$75,042.87	$76,768.85	$78,534.54	$80,340.83	$82,188.67
Investment Interest[3]	$21,775.62	$21,775.62	$21,775.62	$21,775.62	$21,775.62	$21,775.62	$21,775.62	$21,775.62	$21,775.62	$21,775.62	$21,775.62
Miscellaneous Revenue[1]	$16,354.03	$16,730.17	$17,114.96	$17,508.61	$17,911.30	$18,323.26	$18,744.70	$19,175.83	$19,616.87	$20,068.06	$20,529.62
CIP Loan (SO-2)	$-	$-	$-	$-	$-	$-	$1,335,700.00	$-	$-	$-	$-
Total Revenue	**$850,928.00**	**$897,873.39**	**$947,654.65**	**$1,000,447.63**	**$1,056,439.21**	**$1,115,827.96**	**$2,476,691.17**	**$1,166,733.13**	**$1,193,067.15**	**$1,220,006.85**	**$1,247,566.17**
Expenditures											
Salaries, Wages, and Benefits[4]	$292,868.15	$304,582.88	$316,766.19	$329,436.84	$342,614.31	$356,318.88	$370,571.64	$385,394.51	$400,810.29	$416,842.70	$433,516.40
Training/Education[4]	$1,620.83	$1,685.66	$1,753.09	$1,823.21	$1,896.14	$1,971.99	$2,050.87	$2,132.90	$2,218.22	$2,306.95	$2,399.22
Professional Services[4]	$11,323.21	$11,776.14	$12,247.18	$12,737.07	$13,246.55	$13,776.41	$14,327.47	$14,900.57	$15,496.59	$16,116.46	$16,761.11
Water Information Tech[4]	$6,544.47	$6,806.25	$7,078.50	$7,361.64	$7,656.10	$7,962.35	$8,280.84	$8,612.08	$8,956.56	$9,314.82	$9,687.41
Repairs/Maintenance/Testing[4]	$9,030.29	$9,391.50	$9,767.16	$10,157.85	$10,564.16	$10,986.73	$11,426.20	$11,883.24	$12,358.57	$12,852.92	$13,367.03
Supplies[4]	$75,844.59	$78,878.37	$82,033.51	$85,314.85	$88,727.44	$92,276.54	$95,967.60	$99,806.31	$103,798.56	$107,950.50	$112,268.52
Fuel[4]	$2,947.08	$3,064.96	$3,187.56	$3,315.06	$3,447.67	$3,585.57	$3,729.00	$3,878.16	$4,033.28	$4,194.61	$4,362.40
Rentals, Leases, and Permits[4]	$6,798.63	$7,070.57	$7,353.39	$7,647.53	$7,953.43	$8,271.57	$8,602.43	$8,946.53	$9,304.39	$9,676.56	$10,063.63
Utilities[5]	$40,096.28	$42,659.24	$45,386.02	$48,287.09	$51,373.60	$54,657.40	$58,151.10	$61,868.12	$65,822.73	$70,030.12	$74,506.45
Communications[4]	$9,738.01	$10,127.53	$10,532.63	$10,953.94	$11,392.09	$11,847.78	$12,321.69	$12,814.56	$13,327.14	$13,860.22	$14,414.63
Advertising[4]	$167.02	$173.70	$180.65	$187.88	$195.39	$203.21	$211.34	$219.79	$228.58	$237.73	$247.24
Insurance[4]	$21,073.50	$21,916.44	$22,793.10	$23,704.82	$24,653.01	$25,639.13	$26,664.70	$27,731.29	$28,840.54	$29,994.16	$31,193.93
Taxes[4]	$78,087.14	$81,210.63	$84,459.05	$87,837.41	$91,350.91	$95,004.95	$98,805.15	$102,757.35	$106,867.65	$111,142.35	$115,588.05
Audit Costs[4]	$-	$5,590.45	$-	$5,814.07	$-	$6,046.63	$-	$6,288.49	$-	$6,540.03	$-
Capital Improvements[4]	$505,300.00	$535,400.00	$95,600.00	$17,500.00	$261,500.00	$31,700.00	$1,335,700.00	$20,500.00	$177,800.00	$22,200.00	$138,600.00
CIP Loan Repayment (SO-2)[7]	$-	$-	$-	$-	$-	$-	$66,785.00	$63,853.59	$63,853.59	$63,853.59	$63,853.59
Loan Repayment (534-2)[6]	$40,590.00	$40,590.00	$40,590.00	$40,590.00	$40,590.00	$40,590.00	$40,590.00	$40,590.00	$40,590.00	$40,590.00	$40,590.00
Loan Repayment (PR-18)[6]	$13,980.81	$13,749.81	$-	$-	$-	$-	$-	$-	$-	$-	$-
Loan Repayment (PC-20)[6]	$44,276.14	$43,872.14	$43,468.13	$43,064.12	$42,660.12	$42,256.11	$41,852.10	$41,448.10	$41,044.09	$40,640.08	$40,236.08
Misc.[4]	$6,790.85	$7,062.48	$7,344.98	$7,638.78	$7,944.33	$8,262.10	$8,592.59	$8,936.29	$9,293.74	$9,665.49	$10,052.11
Expenditures Total	**$1,167,076.99**	**$1,225,608.75**	**$790,541.14**	**$743,372.15**	**$1,007,765.27**	**$811,357.35**	**$2,204,629.70**	**$922,561.87**	**$1,104,644.52**	**$988,009.29**	**$1,131,707.80**
Operating Cash Flows											
Beginning Cash Balance	$1,103,816	$787,667	$459,932	$617,045	$874,121	$922,795	$1,227,265	$1,499,327	$1,743,498	$1,831,921	$2,063,918
Total Revenues	$850,928	$897,873	$947,655	$1,000,448	$1,056,439	$1,115,828	$2,476,691	$1,166,733	$1,193,067	$1,220,007	$1,247,566
Total Expenditures	$1,167,077	$1,225,609	$790,541	$743,372	$1,007,765	$811,357	$2,204,630	$922,562	$1,104,645	$988,009	$1,131,708
Ending Cash Balance	**$787,667**	**$459,932**	**$617,045**	**$874,121**	**$922,795**	**$1,227,265**	**$1,499,327**	**$1,743,498**	**$1,831,921**	**$2,063,918**	**$2,179,777**

(1) All items footnoted number 1 are projected to increase by the projected annual system growth rate of 2.3 percent.
(2) Rate increase is projected to increase identical to the estimated inflation rate of 4 percent.
(3) Investment Interest is projected to remain steady throughout the projected period because, with capital improvement financing, invested reserves will be projected to remain steady.
(4) All items footnoted number 4 are projected to increase at an estimated annual inflation rate of 4 percent.
(5) Utilities are projected to increase at an estimated annual inflation rate of 4 percent plus the projected system growth rate of 2.3 percent.
(6) Debt repayment schedule provided by Town.
(7) The CIP Loan repayment is assumed to be a 40-year annual payment loan with 4 percent interest and 5 percent down the first year.

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FINANCIAL VIABILITY

According to the Department of Health, utilities can work toward financial viability using the following guidelines. The full document detailing these guidelines can be found in Appendix R of this Plan, it is summarized here:

1. **Develop an operating budget.** All utilities should develop a 10-year budget to pay for maintenance and operations of their system. This budget should account for inflation, debt payments, and contributions to reserve accounts. This chapter has established the 10-year operating budget for the Town in Table 9-5.

2. **Take another look at your rates.** Many water systems do not charge enough to pay for basic maintenance and operation of their system, maintain reserve accounts, and make debt payments. Use the 10-year operating budget to assess whether or not your system needs to raise water rates or change rate structure to one which encourages more efficient water use.

3. **Create and fund an operating cash reserve.** This fund should be used only to handle problems with cash flow should there be a lag in income. One suggested approach is to maintain an operating fund with the amount of cash needed to pay for 30 to 45 days of water system costs. Be sure to add funds over time as needed.

4. **Create and fund an emergency reserve.** Your emergency reserve fund should have enough money in it at all times to replace the most vulnerable part of the water system. Transmission lines are the most vulnerable part of the Town of Cathlamet's water system. Based on Table 9-6, the emergency reserve (represented by "Ending Capital Balance") has ample funds to replace a waterline.

5. **Create and fund reserves for capital improvements and equipment replacement.** This fund should be an account set aside to ensure that aging equipment and infrastructure do not become a financial burden for your water system. The Town should develop a list of equipment and infrastructure that will need to be replaced in the next 10 years and keep enough money set aside in the budget to replace it.

RATE STRUCTURE ANALYSIS

The Town's current rate structure includes a meter charge (or base charge) that is based on meter size and a single commodity charge for water use in excess of 350 cubic feet. The fixed service charge should reflect the true costs of delivering water and a minimum use charge. The true costs of delivering water includes current operating costs, the costs associated with over-sizing the system to meet maximum day demand, and the costs of developing future sources of water. Consumption charges that encourage the efficient use of water include increasing block rates, which have a per-unit charge that increases as water consumption increases, and seasonal rates, which include an additional charge for water use above a certain threshold during months when system demand is highest. The Town does not currently have increasing block rates or seasonal rates but could add one or both of these rate structures to encourage more efficient water use.

The Town show increase rates to at least keep up with inflation

CONCLUSIONS AND RECOMMENDATIONS

Based on our review of the Town's water utility finances and planned capital improvements, the current rates are not sufficient enough to fund operations and planned capital improvements over the 10-year planning period, while maintaining a net positive ending cash balance. A rate increase will be needed to maintain reserves through the end of the 10-year planning period. A rate structure analysis will be needed to determine how best to increase revenue while impacting ratepayers the least. Possibilities include adding a second tier rate for use over 1,000 cubic feet of water use per month and seasonal rates when system demand is highest. A rate increase for the fixed service charge may also be necessary.

AVAILABLE CAPITAL IMPROVEMENT FUNDING SOURCES

The following are potential funding sources available for financing public water utility improvements.

Grants:	Community Development Block Grant (CDBG) US Economic Development Administration (US EDA) USDA Forest Service, Rural Assistance Program (USFS) USDA Rural Development (RD)
Loans:	Public Works Trust Fund (PWTF) Community Economic Revitalization Board (CERB) Drinking Water State Revolving Fund (DWSRF) USDA Rural Development (RD)
Bonds:	Revenue Bonds General Obligation Bonds
Other:	Utility Local Improvement Districts

COMMUNITY DEVELOPMENT BLOCK GRANT (CDBG)

The Community Development Block Grant program, administered by the Washington State Department of Commerce, consists of two programs that can be used to fund water system planning and construction projects. The first is the Planning-Only Grant program. This program supports a range of planning activities that lead to implementation of priority projects that benefit low- and moderate-income communities. Funding levels are set at a maximum of $30,000 for most planning projects.

The second program is the General Purpose grant program, which allows applicants to request up to $1 million for design and construction of public facilities, community facilities, housing rehabilitation, or economic development projects that principally benefit low- and moderate-income persons. Local match is not required for either the Planning-Only or General Purpose programs. Applications are typically due in early June, and grants are awarded early September.

PUBLIC WORKS TRUST FUND (PWTF)

The Public Works Trust Fund (PWTF) is a revolving loan fund designed to help local governments finance needed public works projects through low-interest loans and technical assistance. The PWTF, established in 1985 by legislative action, currently offers loans substantially below market rates.

- 5-year preconstruction loans up to $1 million are available; work must be completed within 2 years.
- Construction loans up to $10 million are available with a 20-year loan repayment period. Construction must be completed within 5 years.
- Emergency loans of up to $1 million are offered with a 20-year loan repayment term, or the life of the project, whichever is less.

The application cycle for preconstruction and construction loans is biennial, and the application cycle for emergency loans is open until available funds are exhausted. The next funding cycle is expected to be announced in early 2023. Eligible public works systems include streets and roads, bridges, storm sewers, sanitary sewers, and domestic water. Loans are presently offered for purposes of repair, replacement, rehabilitation, reconstruction or improvement of existing eligible public works systems, and can be sized to meet the needs of growth.

COMMUNITY ECONOMIC REVITALIZATION BOARD (CERB)

The Community Economic Revitalization Board (CERB) offers programs to rural communities for prospective development projects when feasibility is demonstrated. Applicants must provide evidence that a private development or expansion is likely to occur as a result of the public improvements. CERB requires that the project generate either significant job creation or significant private investment in order to be eligible for funding. Grants up to $50,000 with 25 percent (of project cost) matching funds are available for planning, and loans up to $3 million with a maximum 20-year loan term are available for design and construction. Interest rates are 1 percent to 3 percent. Applicants must demonstrate the need for CERB assistance, and a private partner may be required.

DRINKING WATER STATE REVOLVING FUND (DWSRF)

In 1997 the Washington State Department of Health began taking applications for a new loan program called the Drinking Water State Revolving Fund (DWSRF). The program was funded by Congress as part of the 1996 reauthorization of the Safe Drinking Water Act. The program provides low-interest loans to help publicly owned as well as privately owned not-for-profit and for-profit water systems make improvements to water systems for public health protection.

The program is primarily targeted toward projects that will improve public health and safety. Infrastructure improvement projects can also be considered, but are given a lower priority in the ranking. Currently, DWSRF offers loans for preconstruction, construction, and emergency response uses. No local match is required.

- 10-year preconstruction loans for planning and engineering are available with 0 percent interest, 2 percent loan origination fee, 2-year time of performance, and a maximum award of $500,000. Online applications are accepted year-round until funding is exhausted.

- Construction loans are available with a 20-year loan repayment period, or the life of the project, whichever is less. The expected 2022 interest rate is 1.75 percent, and loans are subject to a 1 percent loan fee. The 2022 application period is October 1 through November 30.

- Emergency loans of up to $500,000 are offered with a 0 percent interest rate, 1.5 percent loan fee, 10-year repayment term, and 2-year performance term. Repayment begins the first October after contract execution.

Project rankings and selection are made by the Department of Health; program financial administration is handled by the Department of Commerce.

USDA RURAL DEVELOPMENT

USDA Rural Development (RD) has a loan program that is available to communities whose rates, as a result of projected RD debt payments, are expected to exceed the rates of "similar" communities. Under certain conditions, RD's funding options include a limited grant program. The loan program provides up to 40-year loan terms at an interest rate usually between 2.25 and 4.5 percent. Rates vary depending on hardship condition and market interest rates. RD loans are issued as revenue bonds that require a bond reserve equal to 1 year of debt service. Applications are accepted year-round

US ECONOMIC DEVELOPMENT ADMINISTRATION (US EDA)

US EDA offers competitive grants up to $1 million for projects within Region 10. Projects are selected locally by an economic development district and submitted to Congress for competitive selection among other regions in the United States. Similar to CERB, applicants must have an industrial partner ready to proceed or a feasibility study that establishes realistic job creation.

US FOREST SERVICE

Forest Service grants are available through the Rural Community Assistance Program to assist rural communities that are dependent on natural resources. Project proposals must show a broad community benefit that result in greater ability to improve economically, socially, or environmentally. The project must have the potential for economic development and/or job creation/retention. An application must be located within 100 miles of a Forest Service office and be able to document a history of at least 15 percent dependency on forest products. Grant funds are available for components of planning and design and are limited to $50,000.

REVENUE BONDS

The most common source of funds for construction of major utility improvements is the sale of revenue bonds. These are tax-free bonds are issued by a city or town. The major source of funds for debt service on revenue bonds is from monthly water or sewer service charges. In order to qualify to sell revenue bonds marketable to investors, the bonds typically have contractual provisions for the city or town to meet debt coverage requirements. The city or town must show that its annual net operating income (gross income less operation and maintenance expenses) must be equal to or greater than a factor, typically 1.2 to 1.4 times the annual debt service on all par debt. If a coverage factor has not been specified it will be determined at the time of any future bond issues.

GENERAL OBLIGATION BONDS

A city or town may by council action or special election issue general obligation bonds to finance almost any projects of general benefit to the city or town. The bonds are repaid by tax assessments levied against all privately-owned properties within the city or town. This includes vacant property that would not otherwise contribute to the cost of the specific improvements. This type of bond issue is usually reserved for municipal improvements that are of general benefit to the public, such as arterial streets, bridges, lighting, municipal buildings, firefighting equipment, parks, and water and wastewater facilities. General obligation bonds are the most attractive bonds to investors because they are backed by the municipality's full taxing authority and carry the lowest rate of interest of any type of bond that a city or town may issue.

Disadvantages of general obligation bonds include the following:

- Voter approval is often required. The city or town will incur the legal costs of drafting a ballot measure and pay for the cost of holding a special election. There is also the additional cost of investing staff time in public education of the need for the project, yet there is always uncertainty to the outcome of elections.

- There are legal, as well as practical limits on the amount of general obligation debt a city or town can issue. Financing capital improvements through general obligation debt reduces the ability of the city or town to issue additional general obligation debt, which is often the only source of outside financing for many general government facilities.

UTILITY LOCAL IMPROVEMENT DISTRICTS

Formation of a Utility Local Improvement District (ULID) is a method of financing capital improvements by the sale of bonds. Bonds are retired with revenues collected via assessment on the properties benefitting from the capital improvements funded by the ULID, and via utility revenues. The process for formation and administration of LIDs and ULIDs is outlined in RCW 35.43 through 35.56.

ADDITIONAL RESOURCES

Several additional resources for locating funding opportunities are listed below.

- The Infrastructure Assistance Coordinating Council (IACC) is a nonprofit organization that aims to provide resources and technical assistance to local governments in order to support infrastructure development and maintenance. The IACC's current website is http://www.infrafunding.wa.gov/.

- The Washington Fund Directory is a resource maintained by the Office of the State Treasurer that lists various funding programs by type of project and type of funding. The Washington Fund Directory's current website is https://www.wafunddirectory.wa.gov/.

- The Washington Water and Salmon Fund Finder provides information on grant and loan opportunities for natural resources projects, and is currently located at https://data.wa.gov/stories/s/Washington-Water-Salmon-Fundfinder/xcku-b9qq/.

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: 05/25/2022
Printed: 2/27/2023
WFI Printed For: On-Demand
Submission Reason: Contact Update

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
11850 D	CATHLAMET WATER DEPT	WAHKIAKUM	A	Comm

6. PRIMARY CONTACT NAME & MAILING ADDRESS	7. OWNER NAME & MAILING ADDRESS
DAVID S. MCNALLY [MANAGER] 375 2ND ST CATHLAMET, WA 98612	CATHLAMET, TOWN OF DAVID S. MCNALLY 375 2ND ST CATHLAMET, WA 98612 SUPERINTENDENT
STREET ADDRESS IF DIFFERENT FROM ABOVE	**STREET ADDRESS IF DIFFERENT FROM ABOVE**
ATTN	ATTN
ADDRESS PO BOX 68	ADDRESS
CITY CATHLAMET STATE WA ZIP 98612006	CITY STATE ZIP

9. 24 HOUR PRIMARY CONTACT INFORMATION		10. OWNER CONTACT INFORMATION	
Primary Contact Daytime Phone:	(360) 795-8032 x4	Owner Daytime Phone:	(360) 795-3650
Primary Contact Mobile/Cell Phone:	(360) 431-0721	Owner Mobile/Cell Phone:	
Primary Contact Evening Phone:	(xxx)-xxx-xxxx	Owner Evening Phone:	(xxx)-xxx-xxxx
Fax:	E-mail: dxxxd@townofcathlamet.com	Fax: (360) 795-3780	E-mail: dxxxd@townofcathlamet.com

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

- [x] Not applicable (Skip to #12)
- [ ] Owned and Managed
- [ ] Managed Only
- [ ] Owned Only

SMA NAME: __________ SMA Number:

12. WATER SYSTEM CHARACTERISTICS (mark all that apply)

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

13. WATER SYSTEM OWNERSHIP (mark only one)

- [ ] Association
- [x] City / Town
- [ ] County
- [ ] Federal
- [ ] Investor
- [ ] Private
- [ ] Special District
- [ ] State

14. STORAGE CAPACITY (gallons): 1,030,000

15 Source Number	16 SOURCE NAME — 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	17 INTERTIE — INTERTIE SYSTEM ID NUMBER	18 SOURCE CATEGORY: WELL	WELL FIELD	WELL IN A WELL FIELD	SPRING	SPRING FIELD	SPRING IN SPRINGFIELD	SEA WATER	SURFACE WATER	RANNEY / INF. GALLERY	OTHER	19 USE: PERMANENT	SEASONAL	EMERGENCY	20 SOURCE METERED	21 TREATMENT: NONE	CHLORINATION	FILTRATION	FLUORIDATION	IRRADIATION (UV)	OTHER	22 DEPTH — DEPTH TO FIRST OPEN INTERVAL IN FEET	23 CAPACITY (GALLONS PER MINUTE)	24 SOURCE LOCATION: 1/4, 1/4 SECTION	SECTION NUMBER	TOWNSHIP	RANGE
S01	ELOCHOMAN RIVER									X			X			Y		X	X	X		X		600	NE SW	31	9N	05W

WATER FACILITIES INVENTORY (WFI) FORM - Continued

1. SYSTEM ID NO.	2. SYSTEM NAME	3. COUNTY	4. GROUP	5. TYPE
11850 D	CATHLAMET WATER DEPT	WAHKIAKUM	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?)		649	Unspecified
A. Full Time Single Family Residences (Occupied 180 days or more per year)	624		
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	19		
B. Full Time Residential Units in the Apartments, Condos, Duplexes, Dorms that are occupied more than 180 days/year	25		
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	
B. Institutional, Commercial/Business, School, Day Care, Industrial Services, etc.	55	55	
28. TOTAL SERVICE CONNECTIONS		704	

29. FULL-TIME RESIDENTIAL POPULATION

A. How many residents are served by this system 180 or more days per year? 1155

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?	700	700	1100	1100	1100	900	900	900	900	900	900	900
B. How many days per month is water accessible to the public?	30	30	30	30	30	30	30	30	30	30	30	30

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?	446	429	426	421	446	210	74	83	400	446	441	446
B. How many days per month are they present?	20	20	20	20	20	20	20	20	20	20	20	20

33. ROUTINE COLIFORM SCHEDULE	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
	2	2	2	2	2	2	2	2	2	2	2	2

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
11850	CATHLAMET WATER DEPT

Total WFI Printed: 1

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

Water Facilities Inventory (WFI)

Report Create Date:	2/27/2023		
Water System Id(s):	11850D		
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

WATER RIGHTS CERTIFICATE AND PERMITS

CERTIFICATE RECORD NO. 21, PAGE NO. 10260

STATE OF WASHINGTON, COUNTY OF Wahkiakum

CERTIFICATE OF SURFACE WATER RIGHT

(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 Water Resources thereunder.)

This is to certify that TOWN OF CATHLAMET *of* Cathlamet, *State of* Washington, *has made proof to the satisfaction of the Department of Water Resources of Washington, of a right to the use of the waters of* Elokomin River, *a tributary of* Columbia River, *with point or points of diversion within the* Gustavus Kreb D.L.C. No. 37 *Sec.* 31, *Twp.* 9 *N., R.* 5 W., *W. M., under and subject to provisions contained in* appropriation *Permit No.* 3301 *issued by the Department of Water Resources, and that said right to the use of said waters has been perfected in accordance with the laws of Washington, and is hereby confirmed by the Department of Water Resources of Washington and entered of record in Volume* 21, *at Page* 10260, *on the* 22nd *day of* March, 1968; *that the priority date of the right hereby confirmed is* February 4, 1941; *that the amount of water under the right hereby confirmed, for the following purposes is limited to an amount actually beneficially used and shall not exceed* 0.83 cubic foot per second continuously during entire year for municipal supply.

A description of the lands under such right to which the water right is appurtenant, and the place where such water is put to beneficial use, is as follows:

Area served by the Town of Cathlamet

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 Sections 6 and 7, Chapter 122, Laws of 1929.

This certificate of surface water right is specifically subject to relinquishment for nonuse of water as provided in Section 18, Chapter 233, Laws of 1967.

WITNESS the seal and signature of the Assistant Director, Division of Water Management, Department of Water Resources affixed this 22nd *day of* March, 1968

Glen H. Fiedler

Assistant Director
Division of Water Management
Department of Water Resources

S. F. No. 7355—7-57—5M. 40781 O.S.

Proof of Appropriation of Water

Application No. .... Permit No. 3301

1. Name of Permittee TOWN OF CATHLAMET-
2. Postoffice address P.O. BOX 68- CATHLAMET, WASH, 98612-
3. Source of appropriation ELOCHOMAN-RIVER-
4. Name or number of works (if any) ELOCHOMAN WATER SYSTEM
5. For what purpose or purposes is water used? SERVICE TOWN AND AREA
6. Give date of beginning of construction MARCH 1- 1967
7. Give date of completion of construction work, including water distribution system NOVEMBER 1967
8. Give date when water was completely applied to proposed use SEPTEMBER 1- 1967
9. If used for irrigation:

   Give number of acres described in permit —

   Give number of acres actually irrigated —
10. If used for power: HP actually developed —
11. LEGAL DESCRIPTION OF PROPERTY ON WHICH WATER IS USED:

    TOWN OF CATHLAMET AND AREA-

12. During what months is water used? ALL 12 MONTHS-
13. Does map filed with your application show correctly the location of well or point of diversion for withdrawal of water, and area of land where water is used? YES
14. If the dimensions, location or type of structure do not correspond to those described in your permit, state what changes have been made, giving dimensions, etc. —
15. Actual measured discharge or diversion of permanent system: 376 gals. per min (gpm or cfs) 0.83 c.f.s

(Sign certification on reverse side)

OK for Cert 0.83 cfs /WKS

STATE PRINTING PLANT OLYMPIA, WASHINGTON

AFFIDAVIT OF PUBLICATION
STATE OF WASHINGTON)
)ss.
COUNTY OF WAHKIAKUM)

Bob Nelson

being first duly sworn on oath deposes and says he is the

Publisher

of The Wahkiakum County Eagle, a weekly newspaper. That said newspaper is a legal newspaper and has been approved as a legal newspaper by order of the superior court in the county in which it is published and it is now and has been for more than six months prior to the date of publications hereinafter referred to published in the English language, continuously as a weekly newspaper in Cathlamet, Wahkiakum County, Washington, and it is now and during all of the said time was printed in an office maintained at the aforesaid place of publication of said newspaper. That the annexed is a true copy of

Notice of [illegible]
[illegible]
[illegible]

as it was published in regular issues and not in supplement form of said newspaper once a week for a period of

[illegible] consecutive weeks, commencing on the [illegible] day of [illegible]

19 [illegible] and ending on the [illegible] day of

[illegible] 19 [illegible] both dates inclusive and that such newspaper was regularly distributed to its subscribers during all of said period. That the full amount of the fee charged for the foregoing publication is the sum of $ [illegible], which amount has been paid in full at the rate of $3.20 a hundred words for the first insertion and $2.40 a hundred words for each subsequent insertion.

[illegible]

Subscribed and sworn to before me this [illegible] day of [illegible]

19 [illegible]

[illegible]

Notary Public in and for the State of Washington, Residing at Cathlamet, Washington

SEAL

STATE OF WASHINGTON
OFFICE OF THE DIRECTOR
DEPARTMENT OF WATER RESOURCES, OLYMPIA
NOTICE OF APPLICATION TO AMEND SURFACE WATER PERMIT NO. 3301
TAKE NOTICE:

That on 17 January 1968, the Town of Cathlamet, Washington filed application to change the point of diversion of 2.0 cubic feet per second of the waters of Elochoman River (Elokomin River), tributary of Columbia river, as authorized in the above-numbered permit.

That said permit provides for the water to be diverted from a point situated in the S½S½ of Sec. 31, T. 9 N., R. 5 W. W. M.

That applicant wishes to change the above-described point of diversion to a point located within the Gustavus Kreb D. L. C. No. 37, in said Sec. 31, T. 9 N., R. 5 W. W. M., said point being about 900 feet downstream from the above-described point of diversion, all within Wahkiakum County, Washington.

Any objections to the proposed amendment must be accompanied by a two dollar ($2.00) recording fee and filed with the Department of Water Resources within thirty (30) days from February 15, 1968.

/s FRED D. HAHN, Deputy Director, Department of Water Resources.

Published: Feb. 8 & 15, 1968.

STATE OF WASHINGTON
OFFICE OF THE DIRECTOR DEPARTMENT OF WATER RESOURCES
OLYMPIA
NOTICE OF APPLICATION TO AMEND SURFACE WATER PERMIT NO. 3301

TAKE NOTICE:

That on 17 January 1968, the Town of Cathlamet, Washington filed application to change the point of diversion of 2.0 cubic feet per second of the waters of Elochoman River (Elokomin River), tributary of Columbia River, as authorized in the above-numbered permit.

That said permit provides for the water to be diverted from a point situated in the S½S½ of Sec. 31, T. 9 N., R. 5 W.W.M.

That applicant wishes to change the above-described point of diversion to a point located within the Gustavus Kreb D.L.C. No. 37, in said Sec. 31, T. 9 N., R. 5 W.W.M, said point being about 900 feet downstream from the above-described point of diversion, all within Wahkiakum County, Washington.

Any objections to the proposed amendment must be accompanied by a two dollar ($2.00) recording fee and filed with the Department of Water Resources within thirty (30) days from (last date of publication.)

Witness my hand and official seal this 17th day of January, 1968.

FRED D. HAHN, Deputy Director
Department of Water Resources

Form 10. S. F. No. 120—7-25-40—3M. 10014.

3301

STATE OF WASHINGTON
DEPARTMENT OF CONSERVATION AND DEVELOPMENT
Division of Hydraulics

Permit to Appropriate Public Waters of the State of Washington

Book No. 1A of Permits, on Page 3301 Under Application No. 7227

Town of Cathlamet

of Cathlamet, Washington

is hereby granted a permit to appropriate the following described public waters of the State of Washington, subject to existing rights and to the following limitations and provisions: Permittee shall construct and maintain at his own expense a weir, or other suitable device, for measuring any water granted herein for irrigation purposes and such appropriation shall be subject to a reasonable rotation system if ordered by the State Supervisor of Hydraulics, and it is further provided that Permittee in the use of water under this permit, shall comply with all the laws of the Departments of Fisheries and Game in accordance with Chap. 127, Laws of 1939, and all regulations and laws hereafter enacted.

Priority date of this permit is February 4, 1943

Source of the proposed appropriation is Elokomin River

tributary of Columbia River

The quantity of water appropriated shall be limited to the amount which can be beneficially applied and not to exceed 2.0 cubic feet per second, or its equivalent in case of rotation, to be used as set out below:

The approximate point of diversion is located 520 ft south and 1185 W from center of Sec 31

3/4/68

Gustavus Kreb D.L.C. No. 37

being within ~~S½ of S½~~ Sec. 31, Twp. 9 N., Rge. 5 W., W. M.,

county of Wahkiakum

The use, or uses, to which water is to be applied:

For Domestic Supply and Miscellaneous Uses: .... cubic feet per second during entire year for .... to be used within .... Sec. .... Twp. .... N., Rge. .... W. M.

For Irrigation: .... cubic feet per second, from .... to .... each year, for irrigation of .... acres, described as follows:

FOR POWER: ______ cubic feet per second continuously each year. Total power to be developed ______ theoretical horse power. Total fall to be utilized ______ feet.

Nature of works by means of which power is to be developed ______

______

Works to be located in ______ Sec. ______, Twp. ______ N., Rge. ______ W. M.

Water to be returned to ______

Point of return ______ Sec. ______, Twp. ______ N., Rge. ______ W. M.

Use to which power is to be applied ______

FOR MUNICIPAL SUPPLY: 2.0 cubic feet per second during entire year to supply

Town of Cathlamet and Puget Island

DESCRIPTION OF DIVERSION WORKS

Height of dam ______ ft.; Length on top ______ ft.; Length on bottom ______ ft.

Material to be used and character of construction ______

______

Description of headgate ______

CANAL SYSTEM

AT HEADGATE: Width on top (at water line) ______ ft.; Width on bottom ______ ft.;

Depth of water ______ ft.; Grade ______ ft. fall per one thousand feet.

AT ______ MILES FROM HEADGATE: Width on top (at water line) ______ ft.; Width on bottom ______ ft.; Depth of water ______ ft; Grade ______ feet per one thousand feet.

(Please read carefully provisions below) 10-1-67

Extended to 10-1-46

Construction work shall begin on or before 10-1-66 October 1, 1943 10-1-49 [illegible]

and shall thereafter be prosecuted with reasonable diligence and completed on or before [illegible]

October 1, 1944 10-1-68

and complete application of water to proposed uses shall be made on or before [illegible]

October 1, 1945 10-1-69

Given under my hand and the seal of this office at Olympia, Washington, this 26th day of May, 19 41

State Supervisor of Hydraulics.

STATE OF WASHINGTON
DEPARTMENT OF CONSERVATION AND DEVELOPMENT
Division of Hydraulics

APPLICATION FOR A PERMIT
To Appropriate Public Waters of the State of Washington

Application No. 5355 Permit No. 3301

I, Town of Cathlamet, Washington
(Name of applicant)

of Cathlamet (Postoffice), County of Wahkiakum

State of Washington, do hereby make application for a permit to appropriate the following described public waters of the State of Washington subject to existing rights:

If the applicant is a corporation, give date and place of incorporation [illegible]

1. The source of the proposed appropriation is Elokomin ~~(Elocoman)~~ River
(Name of stream)
tributary of Columbia River

2. The amount of water which the applicant intends to apply to beneficial use is [illegible] cubic feet per second.

3. The use to which the water is to be applied is domestic, municipal supply
(Irrigation, power, mining, manufacturing, domestic supply, etc.)

4. Time during which water will be required each year Continuously

5. The approximate point of diversion is located To be supplied later (Leave this blank)
(Give distance and bearing to section corner)

being within the ~~SE/4 - SW/4~~ S S S (Give smallest legal subdivision) of Sec. ~~30~~ 31, Tp. 9 N., R. 5 W. W.M. (No. R. or W.)

in the county of Wahkiakum

6. The pipe line (Main ditch, canal, or pipe line) to be 15000 ft. ~~or miles~~ in length, terminating in the nw/4 (Smallest legal subdivision) of Sec. 12, Tp. 8 N N., R. 6 W W.M. (No. R. or W.)
the proposed location being shown on the accompanying map.

7. The name of the ditch, canal or other works is

8. Estimated cost of development necessary to utilize fully the appropriation herein asked for $ 25,000

9. Does the stream from which you wish to appropriate water flow through the tract of land on which the water is to be used? no

10. Do you own the required right-of-way for the proposed works? No

DESCRIPTION OF WORKS.

DIVERSION WORKS—

11. (a) Height of diversion dam feet; length on top feet; length at bottom feet; material to be used and character of construction
(Loose rock, concrete, masonry, rock and brush, timber crib, etc., wasteway over or around dam)

(b) Description of headgate Concrete intake
(Timber, concrete, etc., number and size of openings)

When storage works are contemplated a storage permit must be filed in addition to the above. These forms can be secured, together with instructions, by addressing the State Supervisor of Hydraulics, Olympia, Washington.

CANAL SYSTEM—

12. (a) Give approximate dimensions at each point of canal where materially changed in size, stating miles from headgate. At headgate: Width on top (at water line) ________ feet; width on bottom ________ feet; depth of water ________ feet; grade ________ feet fall per one thousand feet.

(b) At ________ miles from headgate: Width on top (at water line) ________ feet; width on bottom ________ feet; depth of water ________ feet; grade ________ feet fall per one thousand feet.

____

____

____

SUPPLY THE FOLLOWING INFORMATION ACCORDING TO USE PROPOSED.

IRRIGATION—

13. The land to be irrigated has a total area of ________ acres, described as follows: ________
(Give legal subdivision by section, township and range)

____

____

____

____

____

____

____

____
(If more space is required, attach separate sheet.)

14. Give the legal description of land when water is to be used for purposes other than irrigation, power and municipal supply ________ (Legal subdivisions) Sec. ________, Tp. ________ N., Rge. ________ (E. or W.) W. M.

(a) To what stream is water returned ________

(b) Locate the point of return ________ (Smallest legal subdivision of section) Tp. ________ N., Rge. ________ (E. or W.) W. M.

POWER—

15. (a) Total amount of power to be developed ________ (Theoretical horsepower) H. P.

(b) Total fall to be utilized ________ (Head) feet.

(c) The nature of the works by means of which the power is to be developed ________

____

____

(d) Such works to be located in ________ (Legal subdivision) of Sec. ________ Tp. ________ N., Rge. ________ (No. E. or W.) W. M.

(e) To what stream is the water to be returned ________

(f) Locate point of return ________ Sec. ________ Tp. ________ N., Rge. ________ (No. E. or W.) W. M.

(g) The use to which power is to be applied is ________

MUNICIPAL SUPPLY—

16. To supply the city of Town of Cathlamet & Puget Island
(Name)

Wahkiakum County, having a present population of 1800

and an estimated population of ____ in 19__

(a) Estimated present requirement ____

(b) Estimated future requirement ____

17. Construction work will begin on or before July, 1941 Allow 2 yrs. [illegible]

18. Construction work will be completed on or before July, 1942

Duplicate maps of the proposed ditch or other works, prepared in accordance with the rules of the State Supervisor of Hydraulics accompany this application.

City of Cathlamet, Wa.
(Name of applicant)

JOHN E. CUNNINGHAM & ASSOCIATES

By M. S. Zickler

Signed in the presence of us as witnesses:

(1) ____ (Name) , ____ (Address of witness)

(2) ____ (Name) , ____ (Address of witness)

Remarks: ____

STATE OF WASHINGTON, } ss.
COUNTY OF THURSTON.

This is to certify that I have examined the foregoing application together with the accompanying maps and data, and return the same for correction or completion, as follows: ____

In order to retain its priority, this application must be returned to the State Supervisor of Hydraulics, with corrections, on or before ____, 19__

WITNESS my hand this ____ day of ____, 19__

State Supervisor of Hydraulics.

PCU, POD, Split Certif
P rpose, Period

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY
SUPERSEDING

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
March 8, 1946		5328	3968-B

NAME
Town of Cathlamet

ADDRESS (STREET)	(CITY)	(STATE)	(ZIP CODE)
Post Office Box 68	Cathlamet	Washington	98612-0068

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, but is limited to an amount actually beneficially used.

PUBLIC WATERS TO BE APPROPRIATED

SOURCE
Elochoman River

TRIBUTARY OF (IF SURFACE WATERS)
Columbia River

MAXIMUM CUBIC FEET PER SECOND	MAXIMUM GALLONS PER MINUTE	MAXIMUM ACRE-FEET PER YEAR
0.2 cfs		(None transferred)

QUANTITY, TYPE OF USE, PERIOD OF USE

(No annual quantity transferred; increase of diversion rate only). Municipal supply Year-round, as needed

LOCATION OF DIVERSION/WITHDRAWAL

APPROXIMATE LOCATION OF DIVERSION--WITHDRAWAL
520 feet south and 1185 feet west of the center of Section 31.

LOCATED WITHIN (SMALLEST LEGAL SUBDIVISION)	SECTION	TOWNSHIP N.	RANGE, (E. OR W.) W.M.	W.R.I.A.	COUNTY
Gustavius Kreb D.L.C. No. 37	31	9	5W	25	Wahkiakum

RECORDED PLATTED PROPERTY

LOT	BLOCK	OF (GIVE NAME OF PLAT OR ADDITION)

LEGAL DESCRIPTION OF PROPERTY ON WHICH WATER IS TO BE USED

Area served by the Town of Cathlamet.

PROVISIONS

"Certificates No. 3968-A and 3968-B supersede Certificate of Surface Water Right No. 3968, issued March 22, 1951."

"Total quantities diverted May 1 through September 30 each year under the Town of Cathlamet's Certificates No. 3718-B, 3968-B, and 10260 shall not exce 247.3 acre-feet. Total annual quantities diverted under said certificates shall not exceed 572.3 acre-feet pe ear."

An approved metering device shall be installed and maintained in accordance with RCW 90.03.360, WAC 508-64-020 through -040. Meter readings shall be recorded at least monthly.

"A report of monthly and total quantities pumped from the Elochoman River by the Town of Cathlamet during the previous year, shall be submitted in tabular format to Ecology's Water Resources Program, Southwest Regional Office, annually during the month of February, or more frequently if requested by Ecology."

This Superseding Certificate may be subject to implementation of the minimum requirements established in the Conservation Planning Requirements, Guidelines and Requirements for Public Water Systems Regarding Water Use Reporting, Demand Forecasting Methodology, and Conservation Programs, July 1994, and as revised.

Under RCW 90.03.005 and 90.54.020(6), conservation and improved water use efficiency must be emphasized in the management of the State's water resources, and must be considered as a potential new source of water. Accordingly as part of the terms of this certificate, the applicant may be required to prepare and implement a water c rvation plan proved by Department of Health. The standards for such a plan may be obtained from eit ne Departm of Health or the Department of Ecology.

This Sup ding Certificate is issued subject to Washington Department of Fish and Wildlife hydraulic project approval.

The intake shall be screened at all times in accordance with Department of Fish and Wildlife ening criteria.

"This Superseding Certificate (No. 3968-B) is issued on the condition that the approved diversion rate will be put to beneficial use according to the schedule set forth in Report of Examination No. 3968-B. This certificate may be evoked in the event that the certificate holder does not carry out the appropriation in accordance with said schedule and the above provisions. Said schedule may be extended if a written request justifying extension is submitted to the Departm t of Ecology at least 30 da ior to the date to be extended."

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.

iven under my l and the seal of this office at Olympia, Washington,

this d *day of* ugust *, 19*94 .

Mary Riveland, Director

Department of Ecology

ENGINEERING DATA
OK

by Gale Blomstrom

FOR COUNTY USE ONLY

PCU, POD, Spill Card
Purpose, Period

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY
APPLICATION FOR CHANGE

REPORT OF EXAMINATION

TO APPROPRIATE PUBLIC WATERS OF THE STATE OF WASHINGTON

[X] 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
March 8, 1946	6954	5328	3968-B

NAME
Town of Cathlamet

ADDRESS (STREET)	(CITY)	(STATE)	(ZIP CODE)
Post Office Box 68	Cathlamet	Washington	98612-0068

PUBLIC WATERS TO BE APPROPRIATED

SOURCE
Elochoman River

TRIBUTARY OF (IF SURFACE WATERS)
Columbia River

MAXIMUM CUBIC FEET PER SECOND	MAXIMUM GALLONS PER MINUTE	MAXIMUM ACRE-FEET PER YEAR
0.2 cfs		(None transferred)

QUANTITY, TYPE OF USE, PERIOD OF USE

(No annual quantity transferred; increase of diversion rate only). Municipal supply Year-round, as needed

LOCATION OF DIVERSION/WITHDRAWAL

APPROXIMATE LOCATION OF DIVERSION—WITHDRAWAL
520 feet south and 1185 feet west of the center of Section 31.

LOCATED WITHIN (SMALLEST LEGAL SUBDIVISION)	SECTION	TOWNSHIP N.	RANGE, (E. OR W.) W.M.	W.R.I.A.	COUNTY
Gustavius Kreb D.L.C. No. 37	31	9	5W	25	Wahkiakum

RECORDED PLATTED PROPERTY

LOT	BLOCK	OF (GIVE NAME OF PLAT OR ADDITION)

LEGAL DESCRIPTION OF PROPERTY ON WHICH WATER IS TO BE USED

Area served by the Town of Cathlamet.

DESCRIPTION OF PROPOSED WORKS

A 10" perforated intake pipe buried in river bed; associated pumping and treatment facilities. (Intake structure may be modified during redesign of treatment plant).

DEVELOPMENT SCHEDULE

BEGIN PROJECT BY THIS DATE:	COMPLETE PROJECT BY THIS DATE:	WATER PUT TO FULL USE BY THIS DATE:
June 1, 1996	June 1, 1997	June 1, 1998

REPORT

(See accompanying report entitled, "TOWN OF CATHLAMET -- INVESTIGATION AND FINDINGS ON APPLICATIONS FOR CHANGE, WATER RIGHT CERTIFICATES NO. 3718 AND 3968".)

RECOMMENDATIONS

Based on the above-referenced report, I recommend that Application for Change No. 3968 be approved, and two superseding certificates, No. 3968-A and 3968-B, be issued. The certificates shall be subject to all applicable State laws and regulations.

Certificate No. 3968-A shall be issued in the name of Donald R. and Deloris Wages as set forth in the enclosed Report of Examination No. 3968-A.

Certificate No. 3968-B shall be issued in the name of the Town of Cathlamet, with the entries shown on page 1 of this report, and shall carry the following provisions:

PROVISIONS

"Certificates No. 3968-A and 3968-B supersede Certificate of Surface Water Right No. 3968, issued March 22, 1951."

"Total quantities diverted May 1 through September 30 each year under the Town of Cathlamet's Certificates No. 3718-B, 3968-B, and 10260 shall not exceed 247.3 acre-feet. Total annual quantities diverted under said certificates shall not exceed 572.3 acre-feet per year."

An approved metering device shall be installed and maintained in accordance with RCW 90.03.360, WAC 508-64-020 through -040 (installation, operation, and maintenance requirements are attached). Meter readings shall be recorded at least monthly.

"A report of monthly and total quantities pumped from the Elochoman River by the Town of Cathlamet during the previous year, shall be submitted in tabular format to Ecology's Water Resources Program, Southwest Regional Office, annually during the month of February, or more frequently if requested by Ecology."

The water appropriated under this application will be used for public water supply. The State Board of Health rules require public water supply owners to obtain written approval from the Office of Water Supply, Department of Health, Mail Stop LD-11, Building 3, Olympia, Washington 98504, prior to any new construction or alterations of a public water supply system.

This permit is subject to the implementation of the minimum requirements established in the <u>Interim Guidelines for Public Water Systems Regarding Water Use Reporting, Demand Forecasting Methodology and Conservation Programs</u>, July 1990, and as revised.

Under RCW 90.03.005 and 90.54.020(6), conservation and improved water use efficiency must be emphasized in the management of the state's water resources, and must be considered as a potential new source of water. Accordingly, as part of the terms of this permit, the applicant shall prepare and implement a water conservation plan approved by Department of Health. The standards for such a plan may be obtained from either the Department of Health or the Department of Ecology.

The permit is issued subject to Washington Department of Fish and Wildlife screening criteria as outlined in a hydraulic project approval. Please contact the Department of Fish and Wildlife, 600 Capital Way North, Olympia, Washington, 98501-1091, Attention: Habitat Management Division, (206) 902-2661, to obtain specified requirements for your project.
The intake shall be screened at all times in accordance with Department of Fish and Wildlife screening criteria.

Report Continued

"This superseding certificate (N... 3968-B) is issued on the condition that the approved diversion rate will be put to beneficial use according to the schedule set forth in Report of Examination No. 3968-B. This certificate may be revoked in the event that the certificate holder does not carry out the appropriation in accordance with said schedule and the above provisions. Said schedule may be extended if a written request justifying an extension is submitted to the Department of Ecology at least 30 days prior to the date to be extended."

REPORTED BY: Vinnie Wright Date: June 14, 1994

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY
7272 Cleanwater Lane • PO Box 47775 • Olympia, Washington 98504-7775 • (206) 753-2353

TOWN OF CATHLAMET --
INVESTIGATION AND FINDINGS ON APPLICATIONS FOR CHANGE,
WATER RIGHT CERTIFICATES NO. 3718 AND 3968

May 23, 1994

BACKGROUND:

The Town of Cathlamet obtains its water supply from the Elochoman River under Certificate of Surface Water Right No. 10260, which allows the diversion of 0.83 cubic feet per second (cfs). This rate of diversion is now fully utilized during peak use periods. The Town's water treatment plant no longer meets Department of Health requirements, and must be replaced with a new plant that is sized for future needs. The Town must acquire additional water rights in order to proceed with the new treatment plant.

Due to concerns about seasonal low flows in the Elochoman river, the Department of Ecology cannot approve diversions that would further diminish flows during May through September. As an alternative to applying for a new right, the Town of Cathlamet has filed to acquire portions of two existing irrigation rights in the area, Certificates of Surface Water Right No. 3718 and 3968.

The Town filed the appropriate Applications for Change of Water Right on March 29 and 30, 1993, under the provisions of Chapter 90.03 RCW. Legal notices of the proposed changes were published on June 17 and 24, 1993, in the Wahkiakum County Eagle of Cathlamet, Washington. No protests were received by this office. However, the Washington Department of Wildlife (now Fish and Wildlife) commented that Elochoman River flows should not be further depleted during the months when flows are typically below recommended levels.

Based on the report below, I recommend approval of the requested transfers of rights to the Town of Cathlamet, subject to the provisions shown at the end of the report.

INVESTIGATIONS:

In consideration of these applications, I conducted field investigations on November 3, 1993. I visited the Town of

Cathlamet's diversion site and water treatment plant, accompanied by Tony Schmidt, Water Superintendent; Dave Smith, Assistant Public Works Supervisor; and Robert A. VanderZanden, P. E., Town Engineer (Gibbs & Olson Inc.). I met with the holders of Certificate No. 3968, Donald R. and Deloris Wages, at their home; Mr. and Mrs. Wages also represent Eunice Wages, the holder of Certificate No. 3718. I visited both of the irrigated sites with Mr. Wages. Other investigations included conversations with William J. Faubion, Attorney for the Town of Cathlamet, and a review of information submitted with the application. I also researched pertinent recorded water rights, and consulted Ecology's earlier assessment of Elochoman River flow data (Application File No. S2-27954).

Transfers requested. Certificates No. 3718 and 3868 date from 1946. They were issued for 0.5 cfs and 0.4 cfs respectively, for irrigation of 90 acres total from two separate points of diversion, April 15 to October 1 each year. The present right holders have agreed to transfer 0.3 cfs from Certificate No. 3718, and 0.2 cfs from Certificate No. 3968 (total 0.5 cfs), to the Town of Cathlamet. The transfers would be accomplished by changes of purpose, place of use, time of use, and point of diversion for those portions of the irrigation rights.

The above diversion rates would be transferred to the Town's existing intake site, located near the river bridge on State Highway 407, about two miles northwest of town. This is about one quarter mile upstream of the point of diversion (POD) under Certificate No. 3718, and about two miles downstream of the POD under Certificate No. 3968.

There are no intervening water rights in the reach of river that would be affected by the upstream transfer (0.3 cfs, Certificate No.3718). The downstream transfer (0.2 cfs, Certificate No. 3968) would have no injurious effect on the holders of other rights.

Low flows in Elochoman River. The Department of Fish and Wildlife maintains steelhead and salmon hatcheries in the Elochoman River basin. The river also supports abundant native runs of anadromous fish. The fishery resources are dependent upon the availability of sufficient river flows to protect instream habitat for native runs, and migratory water for hatchery-reared fish. The Department of Wildlife recommended minimum flows of 300 cfs during February through June, and 60 cfs during July through January. Ecology's earlier analysis (under Application File No. S2-27954) shows that Elochoman River flows are typically below these levels from May 1 through September 30 each year, and seasonally reach lows of approximately 20 cfs.

The Water Resources Act of 1971 (RCW 90.54) requires that perennial rivers and streams of the state shall be retained with base flows necessary to provide for preservation of wildlife, fish, and other environmental values. In light of the above flow conditions, the requested transfers can be approved only if they will not involve further depletion of Elochoman River flows during the May - September period, beyond what is already authorized under existing water rights.

Historic and present irrigation use. The original irrigation uses were pursued until 6 to 12 years ago; during that time, the Wages' reduced the irrigation period to 9 weeks from the original 24 weeks each season, and reduced the total number of acres to 87. The original pumps (0.9 cfs total capacity) were used under each right until about three years ago, when they were replaced with portable equipment (up to 148 gpm or 0.33 cfs capacity) that is moved from one diversion site to the other. This maximum pumping rate reflects calculations submitted by Robert A. VanderZanden, P. E. (letter of January 25, 1994). Mr. VanderZanden's figures were based on the Wages' existing portable Bauer pump, power take-off from tractor at 540 rpm, and "Big Gun" sprinkler with 3/4-inch nozzle.

Mr. Wages did not have specific figures on the annual quantities of water applied per acre. Based on the present use period and pumping rate, it appears that the Wages' irrigation requirement is 41 acre-feet per year (AF/Y) for the total 87 acres. (148 gpm or 0.33 cfs continuously for 9 weeks = 13,426,560 gallons = 41 AF/Y). The Wages' reissued certificates will specify this annual amount of water from either diversion site, or from a combination of the two.

Extent of the irrigation rights. Under RCW 90.14.130-180, a water right (or portion thereof) that has been out of use more than five years is subject to relinquishment. Accordingly, the total existing rights in this case, based on the water requirement during the past five years (above), amount to a total of 0.9 cfs, 41 acre-feet per year, for 9 weeks' irrigation of up to 87 acres.

Any additional annual quantities that might have been represented by the original certificates can no longer be considered for transfer, because they have been out of use for more than five years.

Division of instantaneous pumping rates (cfs). The requested transfers (totalling 0.5 cfs) would allow the Town of Cathlamet to increase its pumping rate to 1.33 cfs, from the 0.83 cfs authorized under Certificate No. 10260. The period of use for the transferred rates would be changed to year-round as needed, subject to the limitations discussed below. This would allow the Town's diversion works and treatment plant to be designed for a single flow rate, rather than varying by season.

The Wages' would be authorized to continue irrigating with their present portable equipment (0.33 cfs capacity). However, the total of the Wages' pumping rate and the rates transferred to the Town (0.5 cfs) cannot exceed the 0.9 cfs total of the two original irrigation rights. Therefore, the Wages' re-issued certificates would allow an alternating diversion under either irrigation right (3718-A or 3968-A) at 0.33 cfs, but not pumping from both locations at the same time. Mr. Wages has indicated that this condition would be acceptable.

Total annual quantities allowable (acre-feet). The Wages intend to continue irrigating up to 87 acres for 9 weeks each year, as they have been doing. Since this is the extent of the existing rights, as discussed above, there are no annual quantities (acre-feet per year) available for transfer to the Town.

Although the Town would receive the increased "peaking" rates requested (0.5 cfs total), the total municipal diversion would still be limited to the amount of water (acre-feet) that could be pumped under the Town's existing Certificate No. 10260, at 0.83 cfs. Allowing for 5% down-time associated with filter plant maintenance, at 0.83 cfs the Town could pump 572.3 acre-feet per year (equivalent to about 511,000 gallons per day average). Superseding Certificates No. 3718-B and 3968-B, issued to the Town, would carry conditions limiting the Town's total annual diversions accordingly. This would still allow for some growth in annual water use, compared with the 1991 demand of 360 acre-feet, or 321,500 gallons per day average.

Total quantities allowable during May - September (acre-feet). Under the requested transfers, overall withdrawals from the Elochoman River must remain within the scope of existing rights, not only annually, but also during the period when flows are generally below recommended levels. The water right changes would not transfer any acre-feet to the Town (see above). Therefore, Superseding Certificates No. 3718-B and 3968-B, issued to the Town, would carry conditions limiting the Town's total diversions during May - September to 247.3 acre-feet, the same amount that could be pumped under existing Certificate No. 10260 during that period. This would be equivalent to 526,635 gallons per day (average) for the May - September period. (This is slightly higher than the annualized average, above, due to less time required for filter backwashing in the summer months).

The above limitations on acre-feet would govern the Town's average water use, but not its peak daily use. Water use on peak days could exceed the averages, using the new maximum diversion rate of 1.33 cfs. The Town would be required to meter its diversion, and to stay within the quantities (acre-feet) stated.

Relinquishment of unused quantities. As a condition of approval of the subject applications, the holders of the irrigation rights will be required to sign relinquishment forms for the portions of the original certificates that have been out of use more than five years, or that will no longer be used. These portions are the following:

1) any annual quantities exceeding 41 acre-feet per year for the two certificates combined; and

2) any diversion rate exceeding 0.33 cfs for the two re-issued irrigation certificates (No. 3718-A and 3968-A) combined. After the transfer of 0.5 cfs to the Town of Cathlamet, this will amount to a relinquishment of 0.07 cfs.

CONCLUSIONS

In accordance with Chapter 90.03.380, I find that the requested changes to Certificates No. 3718 and 3968 can be made, subject to the conditions and provisions shown on the attached Reports of Examination, without detriment or injury to existing rights or to the public interest.

(Please see "RECOMMENDATIONS" sections of the enclosed Reports of Examination No. 3718-A, 3718-B, 3968-A, and 3968-B.)

REPORTED BY: Vinnie Wright

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY

Certificate Record No. 8 , Page No. 3968
State of Washington, County of Wahkiakum

PARTIAL
RELINQUISHMENT OF CERTIFICATE OF WATER RIGHT

X SURFACE WATER ___ GROUND WATER

1. The undersigned Donald R. Wages and Deloris Wages XXXX (are) the holder(s) of a certificate of XXXXXXXX (surface) water right No. 3968 , dated March 22, 1951 , issued by the Department of Ecology or one of its predecessor agencies.

2. Said certificate authorizes withdrawal of public waters of the State of Washington for use for irrigation on A portion of the W½ of Section 29, T. 9 N., R. 5 W.W.M. beginning at the center of Section 29, thence W 1320 feet more or less; thence S 1320 feet more or less; thence E 1320 feet more or less; thence N to point of beginning.

3. A separate "Partial Relinquishment" is being filed concurrently on Certificate of Surface Water Right No. 3718 .

4. From the rights embodied in Certificates No. 3718 and 3968, a total of 0.5 cfs is being transferred to the Town of Cathlamet, through changes of water right approved by the Department of Ecology. According to the terms of said changes, the original right holders will retain total irrigation rights of 0.33 cfs, 41 acre-feet per year under Superseding Certificatas No. 3968-A and 3718-A combined.

5. The undersigned XXXX (have) no further requirement for the rights to withdraw and utilize any additional quantities that may have been embodied in the original Certificate No. 3968 , other than those referred to in Item 4., above.

6. The undersigned XXXX (have) not assigned or otherwise transferred the rights embodied in Certificate No. 3968, except as described in Item 4., above.

7. The undersigned therefore convey(s), quitclaim(s), and relinquish(es) those portions of the rights embodied in said Certificate of Surface Water Right No. 3968 to the State of Washington, described as 0.07 cfs; and any annual quantities exceeding 41 acre-feet per year under Certificates No. 3968-A and 3718-A combined.

8. It is understood that this document shall be recorded by the State of Washington in the county wherein the lands affected by said right are located, and that a superseding certificate shall be issued, in accordance with the terms of the above-referenced changes of water rights, for those portions of the irrigation rights not being relinquished.

Donald R. Wages   Deloris Wages
Signature(s)

STATE OF WASHINGTON
County of Wahkiakum

On this day personally appeared before me Donald R. Wages & Delores Wages to me known to be the individual, or individuals described in and who executed the within and foregoing instrument, and acknowledged that They signed the same as Their free and voluntary act Given under my hand and official seal this 11th day of July , 1994.

NOTARY

Notary Public in and for the State of Washington
residing in Cathlamet, WA

[illegible] POU, POD,
Purpose, Period

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY
SUPERSEDING

CERTIFICATE OF WATER RIGHT

[X] **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
August 1, 1946	7357	5522	3718-B

NAME
Town of Cathlamet

ADDRESS (STREET)	(CITY)	(STATE)	(ZIP CODE)
Post Office Box 68	Cathlamet	Washington	98612-0068

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, but is limited to an amount actually beneficially used.

PUBLIC WATERS TO BE APPROPRIATED

SOURCE
Elochoman River

TRIBUTARY OF (IF SURFACE WATERS)
Columbia River

MAXIMUM CUBIC FEET PER SECOND	MAXIMUM GALLONS PER MINUTE	MAXIMUM ACRE-FEET PER YEAR
0.3 cfs		(None transferred)

QUANTITY, TYPE OF USE, PERIOD OF USE

(No annual quantity transferred; increase of diversion rate only).	Municipal supply	Year-round, as needed

LOCATION OF DIVERSION/WITHDRAWAL

APPROXIMATE LOCATION OF DIVERSION--WITHDRAWAL
520 feet south and 1185 feet west of the center of Section 31.

LOCATED WITHIN (SMALLEST LEGAL SUBDIVISION)	SECTION	TOWNSHIP N.	RANGE, (E. OR W.) W.M.	W.R.I.A.	COUNTY
Gustavius Kreb D.L.C. No. 37	31	9	5W	25	Wahkiakum

RECORDED PLATTED PROPERTY

LOT	BLOCK	OF (GIVE NAME OF PLAT OR ADDITION)

LEGAL DESCRIPTION OF PROPERTY ON WHICH WATER IS TO BE USED

Area served by the Town of Cathl[illegible]net.

CERTIFICATE

"Certificates No. 3718-A and 3718-B supersede Certificate of Surface Water Right No. 3718, issued August 10, 1930."

"Total quantities diverted May 1 through September 30 each year under the Town of Cathlamet's Certificates No. 3718-B, 3968-B, and 10260 shall not exceed 247.3 acre-feet. Total annual quantities diverted under said certificates shall not exceed 572.3 acre-feet per year."

An approved metering device shall be installed and maintained in accordance with RCW 90.03.360, WAC 508-64-020 through -040. Meter readings shall be recorded at least monthly.

"A report of monthly and total quantities pumped from the Elochoman River by the Town of Cathlamet during the previous year, shall be submitted in tabular format to Ecology's Water Resources Program, Southwest Regional Office, annually during the month of February, or more frequently if requested by Ecology."

This Superseding Certificate may be subject to implementation of the minimum requirements established in the Conservation Planning Requirements, Guidelines and Requirements for Public Water Systems Regarding Water Use Reporting, Demand Forecasting Methodology, and Conservation Programs, July 1994, and as revised.

Under RCW 90.03.005 and 90.54.020(6), conservation and improved water use efficiency must be emphasized in the management of the State's water resources, and must be considered as a potential new source of water. Accordingly, as part of the terms of this certificate, the applicant may be required to prepare and implement a water conservation plan approved by Department of Health. The standards for such a plan may be obtained from either the Department of Health or the Department of Ecology.

This Superseding Certificate is issued subject to Washington Department of Fish and Wildlife hydraulic project approval.

The intake shall be screened at all times in accordance with Department of Fish and Wildlife screening criteria.

"This Superseding Certificate (No. 3718-B) is issued on the condition that the approved diversion rate will be put to beneficial use according to the schedule set forth in Report of Examination No. 3718-B. This certificate may be revoked in the event that the certificate holder does not carry out the appropriation in accordance with said schedule and the above provisions. Said schedule may be extended if a written request justifying an extension is submitted to the Department of Ecology at least 30 days prior to the date to be extended."

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 2nd *day of* August, *19* 94.

Mary Riveland, Director

Department of Ecology

ENGINEERING DATA
OK JVH

by Gale Blomstrom

FOR COUNTY USE ONLY

[illegible]

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY
APPLICATION FOR CHANGE

REPORT OF EXAMINATION

TO APPROPRIATE PUBLIC WATERS OF THE STATE OF WASHINGTON

[X] 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
August 1, 1946	7337	5522	3718-B

NAME
Town of Cathlamet

ADDRESS (STREET)	(CITY)	(STATE)	(ZIP CODE)
Post Office Box 68	Cathlamet	Washington	98612-0068

PUBLIC WATERS TO BE APPROPRIATED

SOURCE
Elochoman River

TRIBUTARY OF (IF SURFACE WATERS)
Columbia River

MAXIMUM CUBIC FEET PER SECOND	MAXIMUM GALLONS PER MINUTE	MAXIMUM ACRE-FEET PER YEAR
0.3 cfs		(None transferred)

QUANTITY, TYPE OF USE, PERIOD OF USE

(No annual quantity transferred; increase of diversion rate only).	Municipal supply	Year-round, as needed

LOCATION OF DIVERSION/WITHDRAWAL

APPROXIMATE LOCATION OF DIVERSION-WITHDRAWAL
520 feet south and 1185 feet west of the center of Section 31.

LOCATED WITHIN (SMALLEST LEGAL SUBDIVISION)	SECTION	TOWNSHIP N.	RANGE, (E. OR W.) W.M.	W.R.I.A.	COUNTY
Gustavius Kreb D.L.C. No. 37	31	9	5W	25	Wahkiakum

RECORDED PLATTED PROPERTY

LOT	BLOCK	OF (GIVE NAME OF PLAT OR ADDITION)

LEGAL DESCRIPTION OF PROPERTY ON WHICH WATER IS TO BE USED

Area served by the Town of Cathlamet.

[illegible] WORKS

A 10" perforated intake pipe buried in river bed; associated pumping and treatment facilities (intake structure may be modified during redesign of treatment plant).

[illegible]PMENT SCHEDULE

BEGIN PROJECT BY THIS DATE:	COMPLETE PROJECT BY THIS DATE:	WATER PUT TO FULL USE BY THIS DATE:
June 1, 1996	June 1, 1997	June 1, 1998

REPORT

(See accompanying report entitled, "TOWN OF CATHLAMET -- INVESTIGATION AND FINDINGS ON APPLICATIONS FOR CHANGE, WATER RIGHT CERTIFICATES NO. 3718 AND 3968".)

RECOMMENDATIONS:

Based on the above-referenced report, I recommend that Application for Change No. 3718 be approved, and two superseding certificates, No. 3718-A and 3718-B, be issued. The certificates shall be subject to all applicable State laws and regulations.

Certificate No. 3718-A shall be issued in the name of Eunice Wages as set forth in the enclosed Report of Examination No. 3718-A.

Certificate No. 3718-B shall be issued in the name of the Town of Cathlamet with the entries shown on page 1 of this report, and shall carry the following provisions:

PROVISIONS:

"Certificates No. 3718-A and 3718-B supersede Certificate of Surface Water Right No. 3718, issued August 10, 1950."

"Total quantities diverted May 1 through September 30 each year under the Town of Cathlamet's Certificates No. 3718-B, 3968-B, and 10260 shall not exceed 247.3 acre-feet. Total annual quantities diverted under said certificates shall not exceed 572.3 acre-feet per year."

An approved metering device shall be installed and maintained in accordance with RCW 90.03.360, WAC 508-64-020 through -040 (installation, operation, and maintenance requirements are attached). Meter readings shall be recorded at least monthly.

"A report of monthly and total quantities pumped from the Elochoman River by the Town of Cathlamet during the previous year, shall be submitted in tabular format to Ecology's Water Resources Program, Southwest Regional Office, annually during the month of February, or more frequently if requested by Ecology."

The water appropriated under this application will be used for public water supply. The State Board of Health rules require public water supply owners to obtain written approval from the Office of Water Supply, Department of Health, Mail Stop LD-11, Building 3, Olympia, Washington 98504, prior to any new construction or alterations of a public water supply system.

This permit is subject to the implementation of the minimum requirements established in the Interim Guidelines for Public Water Systems Regarding Water Use Reporting, Demand Forecasting Methodology and Conservation Programs, July 1990, and as revised.

Under RCW 90.03.005 and 90.54.020(6), conservation and improved water use efficiency must be emphasized in the management of the state's water resources, and must be considered as a potential new source of water. Accordingly, as part of the terms of this permit, the applicant shall prepare and implement a water conservation plan approved by Department of Health. The standards for such a plan may be obtained from either the Department of Health or the Department of Ecology.

The permit is issued subject to Washington Department of Fish and Wildlife screening criteria as outlined in a hydraulic project approval. Please contact the Department of Fish and Wildlife, 600 Capital Way North, Olympia, Washington, 98501-1091, Attention: Habitat Management Division, (206) 902-2661, to obtain specified requirements for your project.

(continued on page 3)

Repo. Continued

The intake shall be screened at all times in accordance with Department of Fish and Wildlife screening criteria.

"This superseding certificate (No. 3718-B) is issued on the condition that the approved diversion rate will be put to beneficial use according to the schedule set forth in Report of Examination No. 3718-B. This certificate may be revoked in the event that the certificate holder does not carry out the appropriation in accordance with said schedule and the above provisions. Said schedule may be extended if a written request justifying an extension is submitted to the Department of Ecology at least 30 dayz prior to the date to be extended."

REPORTED BY: Vinnie Wright Date: June 14, 1994

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY

Certificate Record No. 8 , Page No. 3718
State of Washington, County of Wahkiakum

PARTIAL
RELINQUISHMENT OF CERTIFICATE OF WATER RIGHT

X SURFACE WATER ___ GROUND WATER

1. The undersigned Eunice Wages XXX
(is) XXXXX the holder(s) of a certificate of ~~(ground)~~ (surface) water right No. 3718 , dated August 10, 1950 . issued by the Department of Ecology or one of its predecessor agencies.

2. Said certificate authorizes withdrawal of public waters of the State of Washington for use for irrigation on Gustavus Krebs D.L.C. in Section 31, T. 9 N., R. 5 W.W.M.

(if more space is required, attach separate sheet)

3. A separate "Partial Relinquishment" is being filed concurrently on Certificate of Surface Water Right No. 3968 .

4. From the rights embodied in Certificates No. 3718 and 3968, a total of 0.5 cfs is being transferred to the Town of Cathlamet, through changes of water right approved by the Department of Ecology. According to the terms of said changes, the original right holders will retain total irrigation rights of 0.33 cfs, 41 acre-feet per year under Superseding Certificates No. 3968-A and 3718-A combined.

5. The undersigned (has) XXXXXX no further requirement for the rights to withdraw and utilize any additional quantities that may have been embodied in the original Certificate No. 3718, other than those referred to in Item 4., above.

6. The undersigned (has) XXXXXX not assigned or otherwise transferred the rights embodied in Certificate No. 3718 , except as described in Item 4., above.

7. The undersigned therefore convey(s), quitclaim(s), and relinquish(es) these portions of the rights embodied in said Certificate of Surface Water Right No. 3718 to the State of Washington, described as any annual quantities exceeding 41 acre-feet per year under Certificates No. 3718-A and 3968-A combined. .

8. It is understood that this document shall be recorded by the State of Washington in the county wherein the lands affected by said right are located, and that a superseding certificate shall be issued, in accordance with the terms of the above-referenced changes of water rights, for those portions of the irrigation rights not being relinquished.

_____________________ XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
Signature(s)

STATE OF WASHINGTON
County of ____________

On this day personally appeared before me ____________ to me known to be the individual, or individuals described in and who executed the within and foregoing instrument, and acknowledged that ____________ signed the same as ____________ free and voluntary act Given under my hand and official seal this ______ day of ____________, 19___.

____
Notary Public in and for the
State of ____________

residing in ____________

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY
AMENDED

PERMIT

TO APPROPRIATE PUBLIC WATERS OF THE STATE OF WASHINGTON

☒ 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
October 6, 1945	6705	4602	2929

NAME
Town of Cathlamet

ADDRESS (STREET)	(CITY)	(STATE)	(ZIP CODE)
PO Box 153	Cathlamet	Washington	98612

The applicant is pursuant to the Report of Examination which has been accepted by the applicant, hereby granted a permit to appropriate the following public waters of the State of Washington, subject to existing rights and to the limitations and provisions set herein.

PUBLIC WATERS TO BE APPROPRIATED

SOURCE
Elochoman River

TRIBUTARY OF (IF SURFACE WATERS)
Columbia River

MAXIMUM CUBIC FEET PER SECOND	MAXIMUM GALLONS PER MINUTE	MAXIMUM ACRE FEET PER YEAR
0.50		61.5

QUANTITY, TYPE OF USE, PERIOD OF USE
61.5 Acre-feet per year — Municipal supply — Year-round, as needed

LOCATION OF DIVERSION/WITHDRAWAL

APPROXIMATE LOCATION OF DIVERSION--WITHDRAWAL
500 feet South and 1000 feet West from the center of Section 31.

LOCATED WITHIN (SMALLEST LEGAL SUBDIVISION)	SECTION	TOWNSHIP N.	RANGE, (E. OR W.) W.M.	W.R.I.A.	COUNTY
NE¼ SW¼	31	9	5W	25	Wahkiakum

RECORDED PLATTED PROPERTY

LOT	BLOCK	OF (GIVE NAME OF PLAT OR ADDITION)

LEGAL DESCRIPTION OF PROPERTY ON WHICH WATER IS TO BE USED

Lands in Wahkiakum County served by the Town of Cathlamet Municipal Water System.

DESCRIPTION OF PROPOSED WORKS

10"X90' perforated pipe intake filtration trench, wet well, pumps sized to handle 821 gpm.

DEVELOPMENT SCHEDULE

BEGIN PROJECT BY THIS DATE:	COMPLETE PROJECT BY THIS DATE:	WATER PUT TO FULL USE BY THIS DATE:
Started	September 1, ~~2003~~ 2008	September 1, 2021

PROVISIONS

An approved metering device shall be installed and maintained in accordance with RCW 90.03.360, 90.44.450 and WAC 508-64-020 through –040, and WAC 508-12-030. Meter readings shall be recorded at least monthly.

The permittee is advised that notice of Proof of Appropriation of water (under which the final certificate of water right is issued) should not be filed until the permanent distribution system has been constructed and that quantity of water allocated by the permit to the extent water is required, has been put to full beneficial use.

Issuance of this water right is subject to the implementation of the minimum requirements established in the Conservation Planning Requirements, Guideline and Requirements for Public Water Systems Regarding Water Use Reporting, Demand Forecasting Methodology, and Conservation Programs, July 1994, and as revised.

Under RCW 90.03.005 and 90.54.020(6), conservation and improved water use efficiency must be emphasized in the management of the State's water resources, and must be considered as a potential new source of water. Accordingly, as part of the terms of this water right, the applicant shall prepare and implement a water conservation plan approved by Department of Health. The standards for such a plan may be obtained from either the Department of Health or the Department of Ecology.

A certificate of water right will not be issued until a final investigation is made.

This permit shall be subject to cancellation should the permittee fail to comply with the above development schedule and/or to give notice to the Department of Ecology on forms provided by that Department documenting such compliance.

Given under my hand and the seal of this office at Olympia, Washington,

this 28th *day of* December *, 2001.*

Department of Ecology

ENGINEERING DATA
OK ______

by ______
J. Mike Harris, Section Supervisor

POU/POD

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY
APPLICATION FOR CHANGE
REPORT OF EXAMINATION
TO APPROPRIATE PUBLIC WATERS OF THE STATE OF WASHINGTON

☒ 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
October 6, 1945	6705	4602	2929

NAME
Town of Cathlamet

ADDRESS (STREET)	(CITY)	(STATE)	(ZIP CODE)
PO Box 153	Cathlamet	Washington	98612

PUBLIC WATERS TO BE APPROPRIATED

SOURCE
Elochoman River

TRIBUTARY OF (IF SURFACE WATERS)
Columbia River

MAXIMUM CUBIC FEET PER SECOND	MAXIMUM GALLONS PER MINUTE	MAXIMUM ACRE FEET PER YEAR
0.50		61.5

QUANTITY, TYPE OF USE, PERIOD OF USE
61.5 Acre-feet per year — Municipal supply — Year-round, as needed

LOCATION OF DIVERSION/WITHDRAWAL

APPROXIMATE LOCATION OF DIVERSION--WITHDRAWAL
500 feet South and 1000 feet West from the center of Section 31.

LOCATED WITHIN (SMALLEST LEGAL SUBDIVISION)	SECTION	TOWNSHIP N.	RANGE, (E. OR W.) W.M.	W.R.I.A.	COUNTY
NE¼ SW¼	31	9	5W	25	Wahkiakum

RECORDED PLATTED PROPERTY

LOT	BLOCK	OF (GIVE NAME OF PLAT OR ADDITION)

LEGAL DESCRIPTION OF PROPERTY ON WHICH WATER IS TO BE USED

Lands in Wahkiakum County served by the Town of Cathlamet Municipal Water System.

DESCRIPTION OF PROPOSED WORKS

10"X90' perforated pipe intake filtration trench, wet well, pumps sized to handle 821 gpm.

DEVELOPMENT SCHEDULE		
BEGIN PROJECT BY THIS DATE:	COMPLETE PROJECT BY THIS DATE:	WATER PUT TO FULL USE BY THIS DATE:
Started	September 1, 2003	September 1, 2021

REPORT

BACKGROUND:

On August 3, 1999, William J. Faubion, as attorney for the town of Cathlamet, filed an *Application for Change/Transfer* to change the purpose of use, the place of use, and the point of diversion associated with Certificate of Water Right 2929. This surface water right, with a priority date October 6, 1945, was originally issued for diversion of 0.50 cubic feet per second (cfs) from the Elochoman (Elokomin) River, a tributary of the Columbia River, for irrigation of 50 acres. No annual quantity or season of use was prescribed in the certificate. The purpose of this *Application for Change/Transfer* is to increase peaking supply in order to meet current and future peak demands and improve system reliability and efficiency.

Public Notice appeared in "The Wahkiakum County Eagle" newspaper of Cathlamet, Washington on November 4 and 11, 1999. No letters of protest were received during the 30-day protest period.

Under RCW 90.03.380, the Department of Ecology is permitted to change an existing surface water certificate. The Department may issue such a change after publication of notice of the application and findings as prescribed in the case of an original application. Pursuant to RCW 90.03.290, the findings required by an original permit application are as follows: (1) water is available for appropriation/change; (2) the appropriation/change is for a beneficial use; (3) the appropriation/change will not impair existing water rights; and (4) the appropriation/change will not be detrimental to the public interest.

In 1997 the Washington State Supreme Court issued its decision in Okanogan Wilderness League v. Town of Twisp, 133 Wn.2d 769, 947 P.2d 732 (1997). The Court held that water must be put to beneficial use under a surface water right before it can be subject to change pursuant to RCW 90.03.380. In reviewing an application, Ecology must tentatively determine the quantity of water subject to change based on actual historical use.

Based on the provisions of Chapter 90.03 RCW, and my investigation, I recommend approval of this request and issuance of an amended permit for 0.5 cfs, 61.5 acre-feet per year (afy), for municipal water supply, year round.

INVESTIGATION:

In consideration of this requested change, I conducted a field exam on March 24, 2000. I also reviewed the information submitted with the application; the *Town Of Cathlamet Regional Water System Plan*, March, 2000; *Elochoman River Subbasin Salmon And Steelhead Production Plan*, September 1990; the Washington State Department of Fish and Wildlife *1992 Washington State Salmon And Steelhead Stock Inventory* and *2000 Washington State Salmonid Stock Inventory*; *State of Washington Irrigation Guide;* recorded water rights and other pertinent Ecology records. The following narrative is the result of this investigation:

Evaluation of the Water Right

Certificate of Water Right 2929 (priority date October 6, 1945), was issued for diversion of 0.50 cfs (224.4 gpm) from the Elochoman River, tributary of the Columbia River, for irrigation of 50 acres. The point of diversion is located in the NW ¼ of the NE ¼, Section 36, Township 9 N., Range 6 W. W.M. The place of use is within the NE ¼ Section 36 and the SE ¼ Section 25, Township 9 N., Range 6 W. W.M.

The property has been in farm use since the water right issued. Current owners, Dale and Margaret Strueby, have farmed the property and irrigated up to 50 acres of pasture grass since 1967. All irrigation has been done during the summer months, May through September. Although there have been a few years recently that they did not irrigate because of health reasons, there are no indications of any five-year periods of non-use. During the field exam, I observed the power pole and power outlet and some irrigation pipe near the point of diversion. A 15 HP pump has been used for this diversion. A 15 HP pump at 70 percent efficiency is capable of pumping about 600 gpm against a 30-foot head. It is reasonable to conclude that the maximum instantaneous quantity of 0.50 cfs has been put to beneficial use and the right has been perfected.

Certificate of Water Right 2929 does not identify an allocated annual quantity and there are no pumping records available to determine a reasonable perfected annual quantity. The *State of Washington Irrigation Guide* was developed by the United States Department of Agriculture, the Soil Conservation District, and the Washington State Cooperative Extension Service to calculate irrigation requirements for various crops at different sites around the state. Using the recommended value as reported for nearby Longview Washington, pasture grass requires on average, 14.72 inches of additional water per acre during the growing season in this area. This equates to 61.5 afy for irrigation of 50 acres, a reasonable value to assign as a perfected annual quantity.

Proposed Change to Water Right

The current point of diversion is at river mile (RM) 3; the proposed point of diversion is at RM 4.2. The current place of use is 50 acres of the Strueby farm; the proposed place of use is the Town of Cathlamet service area. The current purpose of use is irrigation; the proposed purpose of use is municipal public supply. The time of year this water right has been exercised is during the summer months; the proposed period of use will be year round.

Report Continued

Cathlamet Water Rights Summary

Presently the Town of Cathlamet holds the following water right certificates:

Certificate No.	Priority Date	Source	Location	Amount
10260C	02/04/41	Elochoman River	09N/05W-31	0.83 cfs*
3718-B	08/01/46	Elochoman River	09N/05W-31	0.3 cfs*
3968-B	03/08/46	Elochoman River	09N/05W-31	0.2 cfs*
782C	03/27/28	Abe Creek	08N/06W-02&11	0.50 cfs
40C	06/25/22	Cougar Creek	08N/05W-07	0.60 cfs

**Total quantities diverted May 1 through September 30 each year under these certificates shall not exceed 247.3 acre-feet. Total annual quantities diverted under these certificates shall not exceed 572.3 acre-feet per year.*

In a 1994 water right investigation and subsequent *Report of Exam,* Ecology staff made a tentative determination that the annual quantity associated with Certificate No. 10260C totaled 572.3 afy. This figure was arrived at based on an instantaneous diversion of 0.83 cfs. Allowing for 5% downtime associated with filter plant operation, the town could pump about 510,000 gallons per day on average. The water system plan projects an annual demand of 463 afy in the year 2020 and an average daily demand of 413,500 gallons. It appears that no additional annual quantity is needed at this time.

The total instantaneous diversion authorized under these rights is 2.43 cfs. However, Certificates No. 10260C, No. 3718-B and No. 3968-B, issued for a total 1.33 cfs (597 gpm) from the Elochoman River, are the only source currently being used by the Town of Cathlamet. Abe Creek and Cougar Creek are not tributary to the Elochoman River and water is not being diverted from either source for use by the city. Although water rights were issued to Cathlamet allowing withdrawal from Cougar Creek and Abe Creek, it was reported that Cathlamet has not used either diversion since the Elochoman River withdrawal was permitted. Because of water quality concerns, lack of data, and the expense involved, Cathlamet is not pursuing municipal withdrawals from either source.

The Elochoman River supplies 100% of Cathlamet's water. The water intake is located approximately two miles east of SR4 along SR407. The raw water intake filtration trench consists of 90 feet of 10-inch perforated pipe extending the width of the river. The pipe is installed two 4 feet below the riverbed and backfilled with screened gravel. The pipe delivers raw water through gravity to an intake wet well in the adjacent water treatment plant building. Two, 7.5 HP raw water pumps then deliver water for treatment. Each pump is capable of 300 gpm or a combined rate of 600 gpm, the current total instantaneous diversion rate.

The water system has experienced operational problems with this diversion in the past. The perforated intake line becomes clogged and must be flushed regularly. During times of high turbidity in the river, it becomes necessary to flush the intake every few hours, limiting the system's ability to meet demands. An increase in the instantaneous quantity will allow the water system to better meet supply demands and operate more efficiently.

This *Application for Change/Transfer* would increase the town's instantaneous quantity to 1.83 cfs (821 gpm). The new rate combined with equalizing storage available in the two reservoirs will allow the water system to meet peak hourly and daily demands. The water system plan calculates the current peak hour demand at 757.6 gpm and projects peak hour demand of 1002.6 gpm by the year 2020. Future planned improvements include larger pumps to handle the increased rate.

Effect on Other Water Rights

A search of Ecology water rights records shows no water rights or water right claims in the affected river reach. Moving this point of diversion 1.2 miles upstream will not adversely affect any other water rights.

Effect on Surface Water and Fisheries

The headwaters of the Elochoman River lie in the Willapa Hills of southwest Lewis County and northeast Cowlitz County. The river flows in a southwesterly direction into Wahkiakum County, joining the Columbia River just downstream from Cathlamet. Climate in the basin is influenced by marine air from the Pacific, with wet mild winters and cool, relatively dry summers. Annual rainfall averages 80-100 inches with most of it falling between October and March.

Streamflow originates almost entirely from rainfall and averages 375 cfs with typically wide extremes between the wet winters and the dry summers. Well-drained soils in the hilly headwaters and poorly drained soils in the lower floodplain, contribute to the low water storage potential of the system. This, combined with the lack of snowpack causes large fluctuations in the annual streamflow, often with extremely low base-flows during summer and fall months.

The lower portion of the Elochoman River is tidally influenced to about RM 4.2 at the water plant intake, elevation approximately 40 feet above mean sea level (msl). This correlates with the extent of tidal influence on the lower Columbia River just below Bonneville Dam, elevation approximately 40 feet above msl. The reach of the river affected by this proposed change is within this lower, tidally influenced portion.

The river supports a number of salmonid species through both natural and hatchery production. Two hatcheries, Beaver Creek trout hatchery at RM 6 and the Elochoman River salmon hatchery at RM 9, have been in operation since the 1950's, although the Beaver Creek hatchery closed in 1999 due to funding constraints, with part of the operation shifting upstream to the salmon hatchery. The salmon hatchery raises fall chinook and coho, and the trout hatchery raised winter steelhead and coastal cutthroat. The summer/fall low-flows and loss of habitat from past land practices, namely logging and agriculture, limit natural production in the system.

Fall chinook salmon are the species most impacted by low base-flows. They enter the river in late summer and spawn from late September to mid November. Because flows are generally too low for passage when fish first enter the river, a weir at the Foster Road Bridge (RM 2.2) is used to collect fish which are then trucked to the hatchery. When the hatchery has reached its egg-take goal, remaining fish are allowed to proceed upstream and spawn naturally when flows are sufficient. The fall chinook run was rated as healthy in the 1992 Washington State Department of Fish and Wildlife Salmon and Steelhead Stock Inventory report.

Other species are not as impacted by low-flow conditions because of the times of year spawning occurs. The majority of coho salmon enter the river starting in November and spawn through December. Chum salmon are native to the river and spawn in the lower reaches [illegible] Winter steelhead enter the river from January till May and spawn from March to June in the main stem and tributaries. Coastal cutthroat consisting of anadromous and resident forms are distributed throughout the system. The anadromous fish enter the river beginning in July and continue through the fall with spawning activity occurring from January through April.

The original point of diversion at RM 3 is upstream of the Foster Road Bridge weir at RM 2.2. Therefore, moving the point of diversion approximately 1.2 miles upstream to the extent of the tidal range at the Water Plant will have no additional effect on low-flows at the weir. There should be no additional adverse impact to aquatic habitat. In addition, there is potential benefit to juvenile salmon from elimination of the irrigation pump intake and transfer of the diversion to the screened and covered Water Plant intake. Another expected benefit will be the change from seasonal to year round use. There will be less impact to the river during the critical dry season.

Conservation Program

The water system plan states unaccounted for water at 15% and recommends a leak detection program. Evergreen Rural Water Association can possibly assist with leak detection. In addition, the State Department of Health is obtaining leak detection equipment to assist small water systems.

The further development of the conservation program is also recommended. The program could include a public education/outreach element with conservation information sent with customer billing. The State Department of Health provides free conservation brochures that can be obtained by contacting State Department of Health staff.

RCW 90.54.030 directs the Department of Ecology to be informed with regard to all phases of water resources of the state, in order to make sound resource management decisions. This permit will include detailed provisions for the collection and submittal of water production data.

CONCLUSION AND FINDINGS:

1. The original application for this permit found that water was available for the appropriation. This finding is not affected by this change application.
2. The water will be put to beneficial use for municipal water supply.
3. The change is not expected to impair any existing water rights, whether junior or senior. If an impairment of junior or senior water rights should occur, such impairment would be grounds for curtailment or cessation of any diversion resulting from the change which causes such impairment, or provide such mitigation as to remedy the situation.
4. The change will not be detrimental to the public interest. The change is not expected to cause any detrimental environmental effects on the natural environment. The change is also found to promote the public interest by improving reliability and efficiency for this public water system.

RECOMMENDATION:

Future needs, as projected by the most recent coordinated water system plan, indicate that the town will not have an immediate need for additional annual quantity. However, the perfected instantaneous and annual quantities represented by this water right certificate exist as primary water rights. Therefore, I recommend rescission of the surface water certificate and issuance of an amended permit with a 20-year development schedule. This should allow the town of Cathlamet ample time to perfect the annual quantity portion of this water right and flexibility in meeting future needs.

In accordance with Chapter 90.03 RCW, I find that water is available from the source in question, that this change will not impair senior rights or be detrimental to the public's welfare.

I recommend the issuance of an amended permit to divert 0.50 cfs instantaneous quantity, 61.5 afy annual quantity from the Elochoman River for municipal supply, year round, subject to the following provisions.

PROVISIONS:

An approved metering device shall be installed and maintained in accordance with RCW 90.03.360, 90.44.450 and WAC 508-64-020 through –040, and WAC 508-12-030. Meter readings shall be recorded at least monthly.

The applicant is advised that notice of Proof of Appropriation of water (under which the final certificate of water right is issued) should not be filed until the permanent distribution system has been constructed and that quantity of water allocated by the permit to the extent water is required, has been put to full beneficial use.

Issuance of this water right is subject to the implementation of the minimum requirements established in the Conservation Planning Requirements, Guideline and Requirements for Public Water Systems Regarding Water Use Reporting, Demand Forecasting Methodology, and Conservation Programs, July 1994, and as revised.

Under RCW 90.03.005 and 90.54.020(6), conservation and improved water use efficiency must be emphasized in the management of the state's water resources, and must be considered as a potential new source of water. Accordingly, as part of the terms of this water right, the applicant shall prepare and implement a water conservation plan approved by Department of Health. The standards for such a plan may be obtained from either the Department of Health or the Department of Ecology.

A certificate of water right will not be issued until a final investigation is made.

REPORTED BY: Pat Locke Date: November 1, 2001

The statutory amended permit fee for this application is $20.00.

FINDINGS OF FACT AND DECISION

Upon reviewing the above report, I find all facts, relevant and material to the subject change application, have been thoroughly investigated. Furthermore, I find water is available for appropriation and the appropriation as recommended is a beneficial use and will not be detrimental to existing rights or the public welfare.

Therefore, I ORDER an Amended Permit be issued under Surface Water Change Application Number 2929, subject to existing rights and indicated provisions, to allow appropriation of public surface water for the amount and uses specified in the foregoing report.

Signed at Olympia, Washington, this 1st day of November, 2001.

J. Mike Harris
Water Resources Supervisor
Southwest Regional Office

(S. P. No. 500—21-44—1M. 1551.

CERTIFICATE RECORD NO. 6, PAGE NO. 2929

STATE OF WASHINGTON, COUNTY OF Wahkiakum

CERTIFICATE OF WATER RIGHT

(In accordance with the provisions of Chapter 117, Laws of Washington for 1917, and amendments thereto, and the rules and regulations of the State Supervisor of Hydraulics thereunder.)

This is to certify, that RAYMOND WIEST *of* Cathlamet, *State of* Washington, *has made proof to the satisfaction of the State Supervisor of Hydraulics of Washington, of a right to the use of the waters of* Elokomin River, *a tributary of* Columbia River, *with point or points of diversion within the* Thompson Dray D.L.C. *Sec.* 36, *Twp.* 9 N., *Range* 6 W., *W. M., for the purposes of* irrigation *under* Appropriation *Permit No.* 4602 *issued by the State Supervisor of Hydraulics, and that said right to the use of said waters has been perfected in accordance with the laws of Washington, and is hereby confirmed by the State Supervisor of Hydraulics of Washington and entered of record in Volume* 6, *at Page* 2929, *on the* 8th *day of* January, 1948; *that the right hereby confirmed dates from* October 6, 1945; *that the amount of water to which such right is entitled and hereby confirmed, for the purposes aforesaid, is limited to an amount actually beneficially used for said purposes, and shall not exceed* 0.50 of a cubic foot per second.

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

PLACE OF USE			LEGAL SUBDIVISION	FOR IRRIGATION	
Section	Township	Range		No. Acres Described in Permit	No. Acres Actually Irrigated
36	9 N.	6 W.W.M.	That portion of N½ of NE¼	50	50
			and		
25	9 N.	6 W.W.M.	That portion of SE¼ of SE¼		
			located within the boundaries		
			of Thompson Dray Donation		
			Land Claim.		

LOCATION OF POWER PLANT			LEGAL SUBDIVISION	FOR POWER	
Section	Township	Range		H. P. Described in Permit	H. P. Actually Developed

Section	Township	Range	LEGAL SUBDIVISION	FOR OTHER USES

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 Sections 6 and 7, Chapter 122, Laws of 1929.

WITNESS the seal and signature of the State Supervisor of Hydraulics affixed this 8th *day of* January, 1948

Rodney Cuyler[?]

State Supervisor of Hydraulics.

MEMORANDUM OF AGREEMENT

WHEREAS, THE TOWN OF CATHLAMET (the Town), is the supplier of water to Cathlamet and surrounding areas of the County; and

WHEREAS, DALE STRUEBY and **MARGARET STRUEBY,** husband and wife, (Strueby), are the owners of a .5 cubic foot per second, water right on the Elochoman River; and

WHEREAS, the Town desires to purchase and the Strueby's wish to sell to the Town, said water right; **NOW, THEREFORE,**

IT IS HEREBY AGREED as follows:

1. Water Right Purchase. The Town shall purchase the .5 cubic foot per second water right from the Strueby's and the Strueby's shall sell said right to the Town, more particularly described as follows:

> The right to the use of the waters of Elochoman River, with point or points of diversion within the Thompson Dray D.L.C., Section 36, Township 9 North, Range 6 West of the Willamette Meridian under Appropriation Permit No. 4602 issued by the State Supervisor of Hydraulics entered of record in certificate record in Volume 6 at page 2929, records of Wahkiakum County, on the 8th day of January, 1948, in an amount not to exceed 0.50 of a cubic foot per second for irrigation of 50 acres.
>
> Situate in the County of Wahkiakum, State of Washington.

2. A. <u>Purchase Price.</u> The purchase price shall be the sum of **TEN THOUSAND DOLLARS ($10,000.00)** payable within thirty (30) days of satisfaction of all contingencies herein.

2. B. <u>Additional Consideration.</u> As additional consideration for the sale of the described water right, the Town of Cathlamet agrees to waive one water hook-up fee for the following described real property:

> Two and one half (2 1/2) acres immediately adjacent to the Elochoman Grange Property purchased from the Berg Estate in the 1990's and upon which the Berg residence was located.

3. <u>Department of Ecology Approval.</u> The parties acknowledge that said sale and transfer is subject to the approval of the Department of Ecology following calculation of the instantaneous water right to the Town and the determination of conditions affecting the transfer and use of said water right by the Town.

4. <u>Cooperation.</u> Each party agrees to cooperate in the request for transfer of water right and to assist the other to the end that the Department of Ecology approves the transfer of the minimum amount of useful water right to the Town.

5. <u>Option to Cancel Sale.</u> In the event the Department of Ecology shall either (1) not approve the transfer, or (2) shall approve a transfer in an amount less than that considered by the Town, in its sole discretion, to be economically sufficient to justify the purchase, the Town may cancel this agreement by giving written notice to the Struebys.

6. <u>Authority to Request Transfer.</u> The Struebys hereby authorize the Town to apply for transfer of said water right to the Town.

DATED this 18th day of July, 1999.

Barbara L. West

BARBARA L. WEST, MAYOR
Town of Cathlamet

Dale F Strueby

DALE STRUEBY

Margaret S. Strueby

MARGARET STRUEBY

STATE OF WASHINGTON,)
) ss.
COUNTY OF WAHKIAKUM.)

On this day personally appeared before me **DALE STRUEBY** and **MARGARET STRUEBY**, to me known to be the individuals described in, and who executed the herein and foregoing instrument, and acknowledged that they signed the same as their free and voluntary act and deed for the uses and purposes therein mentioned.

GIVEN UNDER MY HAND AND OFFICIAL SEAL this 12th day of July, 1999.

SHIRLEY A. ROSE
COMMISSION EXPIRES
NOTARY
PUBLIC
AUG 17, 2002
STATE OF WASHINGTON

Shirley A. Rose

Notary Public in and for the State of Washington, residing at Cathlamet.

My Commission expires: 8-17-02

3-Memorandum of Agreement.

Certificate Record No. 2, Page No. 782

State of Washington, County of Wahkiakum

CERTIFICATE OF WATER RIGHT

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

(In accordance with the provisions of Chapter 117, Laws of Washington for 1917, and the regulations of the State Supervisor of Hydraulics thereunder.)

This is to certify, that The Town of Cathlamet *of* Cathlamet, *State of* Washington, *has made proof to the satisfaction of the State Supervisor of Hydraulics of Washington, of a right to the use of the waters of* Abe Creek, *a tributary of* Columbia River *for the purposes of* Domestic supply for the Town of Cathlamet *under* Appropriation *Permit No.* 1127 *issued by the State Supervisor of Hydraulics, and that said right to the use of said waters has been perfected in accordance with the laws of Washington, and is hereby confirmed by the State Supervisor of Hydraulics of Washington and entered of record in Volume* 2, *at Page* 782, *on the* 29th *day of* March, *19*34; *that the right hereby confirmed dates from* March 27th, 1928; *that the amount of water to which such right is entitled and hereby confirmed, for the purposes aforesaid, is limited to an amount actually beneficially used for said purposes, and shall not exceed* 0.5 *cubic feet per second.*

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

PLACE OF USE			LEGAL SUBDIVISION	[illegible]	[illegible]
Sections	Township	Range			
2 & 11	8 N.	6 W.W.M.	Town of Cathlamet		

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 Section 39, Chapter 117, Session Laws 1917.

WITNESS the seal and signature of the State Supervisor of Hydraulics affixed this 29th *day of* March, *19*34.

Chas J. Bartholet

State Supervisor of Hydraulics.

NOTICE OF WATER RIGHT APPLICATION

No. 2247.

State of Washington
Office of Supervisor of Hydraulics
Olympia

TO WHOM IT MAY CONCERN:

Notice is hereby given that Town of Cathlamet of Cathlamet, County of Wahkiakum, State of Washington, under date of March 27, 1928 filed with the State Supervisor of Hydraulics, Olympia, Washington, an application for a permit to divert the public waters of Abe Creek, tributary of Columbia River, in the amount of [illegible] cubic foot per second subject to existing rights, continuously each year for the purpose of domestic supply for Town of Cathlamet that the approximate point of diversion is located in the southwest quarter of Section 3, Township 8 N., Range 5 West W. M., in Wahkiakum County.

A map showing the location and plan of said diversion and the place of the proposed use is on file in the office of the State Supervisor of Hydraulics, Olympia, Washington, together with such other information as is required by law.

Any person, firm or corporation whose right will be injuriously affected by said application may file with the State Supervisor of Hydraulics at Olympia, Washington, such objections or representations, in writing, as he may desire to make, within thirty (30) days after date of last publication, which date is April 26, 1928.

Witness my hand and official seal this 29th day of March, A. D. 1928.

R. K. Tiffany,
State Supervisor of Hydraulics.

First publication April 12, 1928.
Last publication April 26, 1928.

Publisher's Affidavit

State of Washington } ss
County of Wahkiakum }

Edgar Burkebile, being first duly sworn on oath, deposes and says that he is the publisher of the Columbia River Sun, a weekly newspaper. That said newspaper is a legal newspaper and it is now and has been for more than six months prior to the date of publications hereinafter referred to, published in the English language, continually as a weekly newspaper in an office maintained at Cathlamet, Wahkiakum County, Wash.

That the annexed is a true copy of a Notice of Water Right Application as it was published in regular issues (not in supplement form) of the Columbia River Sun once each week for a period of 2 consecutive weeks, the date of the first publication being on the 12th day of April, 1928 and the last being on the 26th day of April, 1928 being 3 consecutive issues and that such newspaper was regularly distributed to its subscribers during all of said period. That the full amount of the fee charged for the foregoing publication is the sum of $ 7.41, which amount has been paid in full, at the rate of $1.40 per folio of one hundred words for the first insertion and eighty cents per folio of one hundred words for each subsequent insertion, as provided by Chapter 99 Section 4, Session laws of 1921 of the State of Washington.

Edgar Burkebile

Subscribed and sworn to before me this 23 day of [illegible] 1928

[illegible signature]

Notary Public in and for the State of Washington, residing at Cathlamet.

APPLICATION NO. 2267

Town of Cathlamet

Examination made April 12, 1928.

This application is for 5/10 of a second foot of water from Abe Creek, tributary of Columbia River.

The Town of Cathlamet has grown until their present water system is not sufficient. The present supply is from Couger Creek and Camp Creek. They want to pipe water from Abe Creek to the present intake on Camp Creek.

No one lives on Abe Creek, no road within a mile or more except an old skid road. The point of diversion is in a hilly, partly logged off country.

The Town of Cathlamet has the required right of way and permission from the man owning land at the point of diversion.

There are two or more cubic feet of water at the point of diversion April 12, 1928.

I find public water available and will be put to beneficial use.

Permit should issue subject to existing rights.

Clarence E. Hughes

OK Conference
RK. 9/20/28

Form 14 Bnl. #782 ... 8-29-3?

STATE OF WASHINGTON
DEPARTMENT OF CONSERVATION AND DEVELOPMENT
Division of Hydraulics

Permit No. 1121

Application No. 2267

APPLICATION FOR A PERMIT

To Appropriate Public Waters of the State of Washington

I, The Town of Cathlamet Washington (Name of applicant)

of Cathlamet (Postoffice), County of Wahkiakum

State of Washington, do hereby make application for a permit to appropriate the following described public waters of the State of Washington subject to existing rights:

If the applicant is a corporation, give date and place of incorporation an incorporated Town of the State of Washington

1. The source of the proposed appropriation is Abe Creek (Name of stream) tributary of Columbia River

2. The amount of water which the applicant intends to apply to beneficial use is Five tenths cubic feet per second.

3. The use to which the water is to be applied is Domestic supply for the (Irrigation, power, mining, manufacturing, domestic supplies, etc.) Town of Cathlamet

4. Time during which water will be required each year 12 months

5. The approximate point of diversion is located North 88 deg. East 450 feet from (Give distance and bearing to section corner) the corner common to Sections 7, 8, 17 and 18, Twp. 8 N. R. 5 W. W.M., in Wahkiakum County, Washington being within the Southwest Quarter (Give smallest legal subdivision) of Sec. 8, Tp. 8 N. (No. N. or S.), R. 5 W. (No. E. or W.) W.M. in the county of Wahkiakum

6. The pipe line (Main ditch, canal, or pipe line) to be 1-1/4 miles in length, terminating in the Northeast Quarter (Smallest legal subdivision) of Sec. 7, Tp. 8 N (No. N. or S.), R. 5 W. (No. E. or W.) W.M. the proposed location being shown on the accompanying map.

7. The name of the ditch, canal or other works is a 4" pipe line extending from the proposed Abe Creek intake to present Cougar Creek Dam.

8. (a) Estimated cost of development necessary to utilize fully the appropriation herein asked for $ Three Thousand Dollars, ($3,000.00)

(b) Do you own the required right-of-way? Easement

DESCRIPTION OF WORKS.

DIVERSION WORKS*—

9. (a) Height of diversion dam Five feet; length on top Fifteen feet; length at bottom Five feet; material to be used and character of construction Timber Crib - Waste water over dam (Loose rock, concrete, masonry, rock and brush, timber crib, etc., wasteway over or around dam)

(b) Description of headgate Timber (Timber, concrete, etc.: number and size of openings)

* When storage works are contemplated a storage permit must be filed in addition to the above. These forms can be secured, together with instructions, by addressing the State Supervisor of Hydraulics, Olympia, Washington.

CANAL SYSTEM—

10. (a) Give approximate dimensions at each point of canal where materially changed in size, stating miles from headgate. At headgate: Width on top (at water line) ________ feet; width on bottom ________ feet; depth of water ________ feet; grade Forty feet fall per one thousand feet.

(b) At ________ miles from headgate: Width on top (at water line) ________ feet; width on bottom ________ feet; depth of water ________ feet; grade ________ feet; depth of water ________ feet; grade ________ feet fall per one thousand feet.

SUPPLY THE FOLLOWING INFORMATION ACCORDING TO USE PROPOSED:

IRRIGATION—

11. The land to be irrigated has a total area of ________ acres, described as follows: ________ (Give legal subdivision by section, township and range)

(If more space is required, attach separate sheet)

12. Does the above described land border on the stream from which you desire to appropriate water?

DUTY OF WATER—

Character of soil: Depth ________, sandy ________, volcanic ash ________, loam ________, clay ________, etc. ________;

Annual precipitation ________ inches; precipitation during growing season ________ inches;

Depth of irrigation water required ________ (Expressed in feet or inches)

POWER, MINING, MANUFACTURING, OR TRANSPORTATION PURPOSES—

13. (a) Total amount of power to be developed ________ H. P. (Theoretical horsepower)

(b) Total fall to be utilized ________ feet. (Head)

(c) The nature of the works by means of which the power is to be developed ________

(d) Such works to be located in ________ (Legal subdivision) of Sec. ________

Tp. ________ (No. N. or S.), R. ________ (No. E. or W.) W. M.

(e) To what stream is the water to be returned ________ Sec. ________

(f) Locate point of return ________

Tp. ________ (No. N. or S.), R. ________ (No. E. or W.) W. M.

(g) The use to which power is to be applied is ________

1127

MUNICIPAL SUPPLY—

14. *To supply the city of* Cathlamet (Name)

Wahkiakum *County, having a present population of* 1,000

and an estimated population of 4,000 *in 19*35

15. *Estimated present requirement* 100,000 Gals. per day

16. *Estimated future requirement* 300,000 Gals. per day

17. *Construction work will begin on or before* May 1st, 1928

18. *Construction work will be completed on or before* July 1st, 1928

Duplicate maps of the proposed ditch or other works, prepared in accordance with the rules of the State Supervisor of Hydraulics accompany this application.

Town of Cathlamet Washington
(Name of applicant)

By: Geo. H. Norris

Engineer for said Town.

Signed in the presence of us as witnesses:

(1) ________________ (Name), ________________ (Address of witness)

(2) ________________ (Name), ________________ (Address of witness)

Remarks: This is a supplemental source of gravity supply for the Town of Cathlamet domestic water supply and will probably serve for the next eight or ten years when an entirely new source of supply will have to be sought.

STATE OF WASHINGTON,
COUNTY OF THURSTON. } ss.

This is to certify that I have examined the foregoing application together with the accompanying maps and data, and return the same for correction or completion, as follows: ________________

In order to retain its priority, this application must be returned to the State Supervisor of Hydraulics, with corrections, on or before ________________, *19*____.

WITNESS my hand this ________ *day of* ________________, *19*____.

____
State Supervisor of Hydraulics.

This is to certify that I have examined the foregoing application ... subject to the following limitations and conditions. If for irrigation, this appropriation shall be subject to such reasonable rotation system as may be ordered by the State Supervisor of Hydraulics.

The amount of water appropriated shall be limited to the amount which can be applied to beneficial use and not to exceed ----0.5--------- cubic feet per second, or its equivalent in case of rotation.

The priority date of this permit is March 27, 1928

Actual construction work shall begin on or before June 16, 1929 and shall thereafter be prosecuted with reasonable diligence and be completed on or before June 16, 1930

Complete application of the water to the proposed use shall be made on or before October 16, 1930

Given under my hand and the seal of this office at Olympia, Washington, this 16th day of June, 1928.

Conditions Accepted:

Permittee.

R. K. TIFFANY
State Supervisor of Hydraulics.

Permit No. 1127

Application No. 2267

PERMIT

To Appropriate Public Waters of the State of Washington

Filed by Town of Cathlamet County of Wahkiakum

This instrument was first received in the office of the State Supervisor of Hydraulics, Olympia, Washington, on the 27th day of March, 1928, at 2:10 o'clock P. M.

Approved June 16, 1928

R. K. TIFFANY
State Supervisor of Hydraulics.

Before your certificate of water right is issued it will be necessary for you to file with the State Supervisor of Hydraulics a copy of each of the following reports:

1st. Progress reports (in case temporary permit is issued).
2nd. Affidavit of publication of notice of water right application.
3rd. Notice of beginning of construction.
4th. Notice of prosecution of work with diligence.
5th. Notice of completion of construction.
6th. Notice of application of water to a beneficial use.
7th. Proof of appropriation of water.

Upon a satisfactory showing that the appropriation has been perfected as provided by statute the State Supervisor of Hydraulics will issue a water right certificate.

(Blanks will be furnished by the office of State Supervisor of Hydraulics.)

CERTIFICATE RECORD No. One, PAGE No. 40

STATE OF WASHINGTON, COUNTY OF Wahkiakum

CERTIFICATE OF WATER RIGHT

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

(In accordance with the provisions of Chapter 117, Laws of Washington for 1917, and the regulations of the State Hydraulic Engineer thereunder.)

This is to certify, that Town of Cathlamet, By E. M. Orth, Mayor, *of* Cathlamet *State of* Washington, *has made proof to the satisfaction of the State Hydraulic Engineer of Washington, of a right to the use of the waters of* Cougar Creek, *a tributary of* Columbia River *for the purposes of* domestic and municipal uses *under* Appropriation *Permit No.* 246 *of the State Hydraulic Engineer, and that said right to the use of said waters has been perfected in accordance with the laws of Washington, and is hereby confirmed by the State Hydraulic Engineer of Washington and entered of record in Volume* One, *at Page* 40, *on the* 16th *day of* February, *19*23; *that the right hereby confirmed dates from* June 26, *19*22; *that the amount of water to which such right is entitled and hereby confirmed, for the purposes aforesaid, is limited to an amount actually beneficially used for said purposes, and shall not exceed* 0.6 *cubic feet per second.* The amount granted under this permit is over and above the amount which the Town of Cathlamet is now entitled under an old right.

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

Township	Range	Section	Forty-Acre Tract	No. Acres Described in Permit	No. Acres Actually Irrigated

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 Section 39, Chapter 117, Session Laws 1917.

WITNESS the seal and signature of the State Hydraulic Engineer affixed this 16th *day of* February, *19*23.

Marvin Chase

State Hydraulic Engineer.

State of Washington
Office of Supervisor of Hydraulics
Olympia

NOTICE OF WATER RIGHT APPLICATION

TO WHOM IT MAY CONCERN:
Notice is hereby given that Town of Cathlamet, County of Wahkiakum, State of Washington, under date of June [illegible], 192[illegible], filed with the Supervisor of Hydraulics, Olympia, Washington, an application for a permit to divert the public waters of [illegible] Creek tributary of Columbia River, [illegible] subject to existing rights, [illegible] of each year, for the purpose of domestic supply including ordinary municipal use that the approximate point of diversion is located in NW¼ quarter of NW quarter of Section 7, Township [illegible] N., Range [illegible] W. W. M. A map showing the location and dimensions of said canal and the place of the proposed diversion and use is on file in the office of Supervisor of Hydraulics, Olympia, Washington, together with such other information as is required by law.

Any person, firm or corporation whose right will be injuriously affected by the said application may file with the Supervisor of Hydraulics, at Olympia, Washington, such objections or representations, in writing, as he may desire to make, within thirty (30) days after date of last publication, which date is July 1[illegible], 192[illegible].

Witness my hand and official seal this 24th day of June, A. D. 1922.
(Seal) Marvin Chase,
Supervisor of Hydraulics.
First publication June 29, 192[illegible]
Last publication July 1[illegible], 192[illegible]

Affidavit of Publication

STATE OF WASHINGTON, [illegible]
COUNTY OF WAHKIAKUM [illegible]

[illegible] being first duly sworn on oath deposes and says that he [illegible] of the Columbia River Sun, which is a weekly newspaper. [illegible] the Columbia River Sun is a legal newspaper and it is now and has been [illegible] to the date of publications hereinafter referred [illegible] continually as a weekly newspaper in [illegible] now and during all of [illegible] at the aforesaid place of pub[illegible] newspaper.

[illegible] Notice

[illegible] (and not in supplement form) of said [illegible] period of 3 consecutive weeks, commencing on the [illegible]th day of June 192 2 and ending on the 1[illegible]th day of July, 192 2 [illegible] that such newspaper was regularly distributed to [illegible] during all of said period.

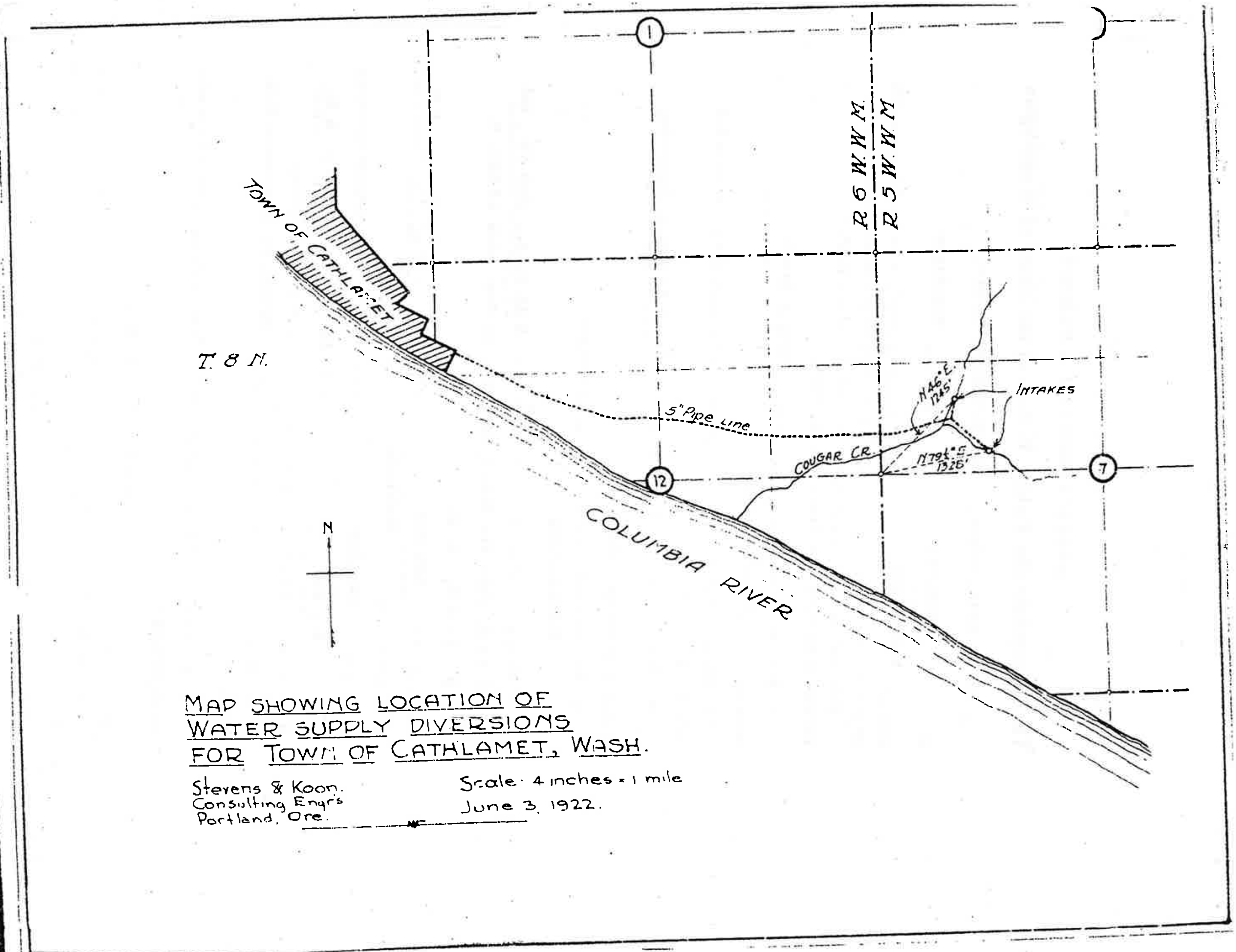
[illegible] the full amount of the fee charged for the foregoing publication is the sum [illegible] 7.[illegible] [illegible] has been paid in full at the rate of $1.40 a hundred words for the first insertion and 80 cents a hundred words for each subsequent insertion.

Edgar Burkely

Subscribed and sworn to before me this 15th day of July, 192 2

[illegible]

Notary Public in and for the State of Washington,
Residing at ~~Cathlamet~~ [illegible]



MAP SHOWING LOCATION OF
WATER SUPPLY DIVERSIONS
FOR TOWN OF CATHLAMET, WASH.

Stevens & Koon.
Consulting Engr's
Portland, Ore.

Scale 4 inches = 1 mile
June 3, 1922.

Permit No.

APPLICATION FOR A PERMIT

To Appropriate the Public Waters of the State of Washington

I, E. M. Orth, Mayor, - For Town of Cathlamet,
(Name of Applicant)

of Cathlamet (Postoffice), County of Wahkiakum

State of Washington, do hereby make application for a permit to appropriate the following described public waters of the State of Washington subject to existing rights:

If the applicant is a corporation, give date and place of incorporation

Application made for Incorporated Town

1. The source of the proposed appropriation is Cougar Creek (Name of stream)

tributary of Columbia River

2. The amount of water which the applicant intends to apply to beneficial use is 0.6 cubic feet per second.

3. The use to which the water is to be applied is Domestic Supply, including (Irrigation, power, mining, manufacturing, domestic supply, etc.) ordinary municipal use.

4. Time during which water will be required each year

Continuously

5. The approximate points of diversion are located N 46 d. E., 1245 ft., and (Give distance and bearing to section corner) N. 79½ d. E. 1326 ft. from ¼ Sec. Cor. on West side of Sec. 7. T. 8 N., R. 5 W., W. M.

being within the SW¼ NW¼ of Sec. 7, Tp. 8 N. (No N or S), R. 5 W. (No E or W), W. M., in the county of Wahkiakum

6. The pipeline to be 1½ miles in length, terminating in the NE¼ NE¼ of Sec. 11, Tp. 8 N. (No N or S), R. 6 W. (No E or W), W. M., the proposed location being shown throughout on the accompanying map.

7. The name of the ditch, canal or other work is Cathlamet Waterworks Pipe Line

8. Estimated cost of development necessary to fully utilize the appropriation herein asked for $5,000.00

DESCRIPTION OF WORKS

Diversion Works

9. (a) Height of dam ... feet; ... feet; length ... feet, ... construction

Small masonry diversion dam 2 ft. high

2 - 3" valves

CANAL SYSTEM—

10. (a) Give approximate dimensions at each point of canal where materially changed in size, stating miles from headgate. At headgate: Width on top (at water line) feet; width on bottom feet; depth of water feet; grade feet fall per one thousand feet.

(b) At miles from headgate: Width on top (at water line) feet; width on bottom feet; depth of water feet; grade feet; depth of water feet; grade feet fall per one thousand feet.

FILL IN THE FOLLOWING INFORMATION WHERE THE WATER IS USED FOR:

IRRIGATION—

11. The land to be irrigated has a total area of acres, described as follows: (Give legal subdivision by section, township and range)

(If more space is required, attach separate sheet)

DUTY OF WATER—

12. Character of soil: Depth , sandy , volcanic ash , loam , clay , Etc. ; Annual precipitation inches, precipitation during growing season inches; Depth of irrigation water required (Expressed in feet or inches)

POWER, MINING, MANUFACTURING, OR TRANSPORTATION PURPOSES—

13. (a) Total amount of power to be developed (Theoretical horsepower) H. P.

(b) Total fall to be utilized (Head) feet.

(c) The nature of the works by means of which the power is to be developed

(d) Such works to be located in (Legal subdivision) of Sec.

Tp. (No. N or S) , R. (No. E or W) W. M.

(e) To what stream is the water to be returned

(f) Locate point of return Sec.

Tp. (No. N or S) , R. (No. E or W) W. M.

(g) The use to which power is to be applied is

MUNICIPAL SUPPLY—

14. *To supply the city of* Cathlamet, (Name)

Wahkiakum *County, having a present population of* 450

and an estimated population of -- *in 19*

15. *Estimated present requirement* 0.4 sec. ft.

16. *Estimated future requirement* 0.6 sec. ft.

17. *Construction work* ~~xxxxxxxxxxxxx~~ is finished.

18. *Construction work will be completed on or before*

Duplicate maps of the proposed ditch or other works, prepared in accordance with the rules of the State Hydraulic Engineer, accompany this application.

E. M. ORTH, (Name of Applicant) Mayor

For TOWN OF CATHLAMET

Signed in the presence of us as witnesses:

(1) C. E. Carlson (Name), Cathlamet, Wash. (Address of Witness)

(2) Joseph Girard (Name), Cathlamet, Wash. (Address of Witness)

Remarks: This application covers a supply now used and which has been used for many years. New and larger pipe line recently constructed.

STATE OF WASHINGTON, } ss.
COUNTY OF THURSTON.

This is to certify that I have examined the foregoing application (Received (Date)*) together with the accompanying maps and data, and return the same* (Date of return) *for correction or completion as follows:*

In order to retain its priority, this application must be returned to the State Hydraulic Engineer, with corrections, on or before , 19 .

WITNESS my hand this *day of* , 19 .

State Hydraulic Engineer.

STATE OF WASHINGTON, } ss.
COUNTY OF THURSTON.

This is to certify that I have examined the foregoing application and do hereby grant the same, subject to the following limitations and conditions: If for irrigation, this appropriation shall be subject to such reasonable rotation system as may be ordered by the State Hydraulic Engineer ______

The amount granted under this permit is over and above the amount which th. Town of Cathlamet is now entitled under an old right.

The amount of water appropriated shall be limited to the amount which can be applied to beneficial use and not to exceed 0.6 *cubic feet per second, or its equivalent in case of rotation. The priority date of this permit is* June 26, 1922

Actual construction work shall begin on or before October 23, 1923 *and shall thereafter be prosecuted with reasonable diligence and be completed on or before* June 1, 1924

Complete application of the water to the proposed use shall be made on or before September 1, 1924

WITNESS my hand this 23rd *day of* October, *19*22.

MARVIN CHASE
State Hydraulic Engineer.

This form approved by the State Hydraulic Engineer, 1917.

Application No. 761 *Permit No.* 846

PERMIT

To Appropriate the Public Waters of the State of Washington

Filed by E. M. Orth, Mayor, For Town of Cathlamet, *County of* Wahkiakum

This instrument was first received in the office of the State Hydraulic Engineer, Olympia, Washington, on the 26th *day of* June, *19*22, *at* 9:40 *o'clock* A. *M.*

Returned to applicant for correction ______

Corrected Application received ______ *Approved* October 23, 1922

MARVIN CHASE
State Hydraulic Engineer.

Before your certificate of water right is issued it will be necessary for you to fill out and file with the State Hydraulic Engineer a copy of the following reports:

1st. Notice of water right application.

2nd. Notice to begin construction.

3rd. Notice of prosecution of work with diligence.

4th. Notice of completion of construction.

5th. Notice of application of water to a beneficial use.

Upon a satisfactory showing that the appropriation has been perfected as provided by statute the State Hydraulic Engineer will issue a water right certificate.

(Blanks will be fur[illegible])

PARCEL NUMBER	PROPERTY OWNER	ACRES
61004110001	State of Washington	717.9
WQ0501001	Sierra Pacific Holding Co.	693.0
WQ0401001	Sierra Pacific Holding Co.	686.0
71004110001	State of Washington	668.3
WQ0301001	Sierra Pacific Holding Co.	665.0
WQ0901001	Sierra Pacific Holding Co.	665.0
13762000000	PACIFIC WEST TIMBER COMPANY (WA) LLC	663.0
13778000000	PACIFIC WEST TIMBER COMPANY (WA) LLC	658.0
80905110001	Manulife Insurance Co	654.3
40905110001	HT VII QRS Trust C/O Hancock	652.6
90905140001	Manulife Insurance Co	644.0
WQ2101001	Sierra Pacific Holding Co.	641.0
180905310001	730 Texas Timberlands II, LTD	639.9
301004110001	State of Washington	637.9
331005110001	HT VII QRS Trust C/O Hancock	637.5
13779000000	PACIFIC WEST TIMBER COMPANY (WA) LLC	636.0
181004110001	State of Washington	635.8
14316000000	GREEN DIAMOND RESOURCE CO	635.0
70905110001	730 Texas Timberlands II, Ltd.	633.9
191004110001	State of Washington	631.4
21005110001	Manulife Insurance Co	630.8
WQ1601001	Sierra Pacific Holding Co.	627.0
170905410001	Manulife Insurance Co	626.7
151005110001	John Hancock Life Insurance Co #72	623.7
WQ1701001	Sierra Pacific Holding Co.	622.0
221005110001	John Hancock Life Insurance Co #122	621.4
30905110001	SFG HCK Timber Partnership LP	621.2
271005110001	John Hancock Life Insurance Co #122	620.2
13743000000	PACIFIC WEST TIMBER COMPANY (WA) LLC	620.0
361005110001	State of Washington	619.7
161005110001	John Hancock Life Insurance Co #72	619.6
WQ2001001	Sierra Pacific Holding Co.	618.0
291005110001	Manulife Insurance Co	617.9
91005110001	John Hancock Life Inusrance Co #125	617.8
211005110001	John Hancock Life Insurance Co #122	617.2
WQ0801001	Sierra Pacific Holding Co.	616.0
101005110001	John Hancock Life Inusrance Co #72	613.6
14300000000	GREEN DIAMOND RESOURCE CO	613.0
281005120001	John Hancock Life Insurance Co #122	612.4
270905110001	State of Washington	612.4
140905110001	State of Washington	611.8
341005110001	SFG HCK Timber Partnership LP	608.7
260905210001	State of Washington	607.9
11005110001	Manulife Insurance Co	607.2
171005110001	John Hancock Life Insurance Co #125	607.0
81005110001	John Hancock Life Inusrance Co #125	604.7
220905110001	State of Washington	604.0
251005110001	State of Washington	603.7
201005110001	Manulife Insurance Co	603.5
231005110001	HT VII QRS Trust C/O Hancock	601.3
131005110001	Hawaii ERS Timberland LLC	598.3
230905110001	State of Washington	597.7
141005110001	Hawaii ERS Timberland LLC	596.0
31005110001	John Hancock Life Insurance Co #122	595.9

PARCEL NUMBER	PROPERTY OWNER	ACRES
51005110001	HT VII QRS Trust C/O Hancock	593.4
41005110001	John Hancock Life Insurance INS Co #122	592.5
111005110001	Hawaii ERS Timberlands LLC	580.4
191005110001	Manulife Insurance Co	580.3
WQ2901001	State of Washington	577.0
121005110001	Manulife Insurance Co	572.9
181005110001	John Hancock Life Insurance Co #125	566.9
14284000000	GREEN DIAMOND RESOURCE CO	561.0
261005110002	HT VII QRS C/O Hancock	553.5
71005110001	Manulife Insurance Co	532.6
150905410001	State of Washington	524.0
13761002000	PACIFIC WEST TIMBER COMPANY (WA) LLC	521.0
241005110001	State of Washington	491.1
100905130001	John Hancock Life Insurance CO #72	480.9
311004110001	Longview Timberlands LLC	477.1
10905110001	State of Washington	466.8
190905110001	730 Texas Timberlands II, LTD	465.4
14160000000	GREEN DIAMOND RESOURCE CO	414.0
14332000000	GREEN DIAMOND RESOURCE CO	409.0
10905210001	SFG HCK Timber Partnership LP	357.5
160905310001	Manulife Insurance Co	334.8
110905340001	State of Washington	319.7
351005210001	SFG HCK Timber Partnership LP	311.7
120905110001	State of Washington	284.7
351005110001	State of Washington	235.6
280905120001	State of Washington DNR	232.6
280905310001	State of Washington	192.5
280905110001	State of Washington	191.8
311004220001	State of Washington	177.8
200905210001	Longview Timberlands LLC	157.7
210905410001	State of Washington	155.1
190905310001	Longview Timberlands LLC	153.8
120905330001	State of Washington	144.2
20905110001	State of Washington	135.9
241005220001	HT VII QRS Trust C/O Hancock	124.8
290905230001	Longview Timberlands LLC	123.5
110905230001	State of Washington	118.8
210905110001	Longview Timberlands LLC	118.6
10905340001	State of Washington	112.1
110905110001	State of Washington DNR	101.5
10905210001	SFG HCK Timber Partnership LP	97.6
200905120001	Corliss Florek	89.4
100905440001	State of Washington	84.7
200905310001	Lorraine Lechner	82.0
160905420002	State of Washington	78.5
210905340001	Longview Timberlands LLC	77.8
210905310001	Lorraine Lechner	76.8
120905210001	State of Washington DNR	75.1
290905310001	Don Wages	71.9
120905330001	State of Washington	70.9
210905240001	Corliss Florek	63.1
160905130001	Manulife Insurance Co	55.9
200905330001	Longview Timberlands LLC	55.6
110905210001	Robert Olsen	52.3

Cathlamet Watershed Property Ownership

PARCEL NUMBER	PROPERTY OWNER	ACRES
200905120002	Corliss Florek	49.8
351005210001	SFG HCK Timber Partnership LP	47.6
210905210001	George, Margaret, Sue, Hanigan, Orth, John	45.5
160905310001	Manulife Insurance Co	42.8
30905430001	Longview Timberlands LLC	41.8
210905140001	State of Washington	39.3
290905140001	Henry Johnson	39.0
110905220001	John Hancock Life Insurance Co #72	38.8
10905410001	State of Washington DNR	38.7
10905330001	State of Washington DNR	38.5
261005110001	State of Washington	37.7
150905220003	Robert Jungers	35.6
290905440001	State of Washington	33.6
200905310002	Lorraine Lechner	31.8
100905140003	Longview Timberlands LLC	29.7
160905310004	State of Washington	29.4
170905440001	Corliss Florek	27.8
290905410001	Henry Johnson	27.5
290905210003	Jerry L. Hargrove	26.0
200905310002	Lorraine Lechner	23.7
150905110001	John Hancock Life Insurance Co #72	23.1
290905330003	WW Property Development LLC	22.9
200905440004	Joseph Mackey	22.5
160905140001	Marion Paulsen	22.0
290905210002	Kevin Leavitt	22.0
150905220002	Patrick Dennis	20.8
290905110001	John Florek	18.8
160905420005	George Silva	18.0
261005110001	State of Washington	14.9
200905430001	Russ Durrah	14.8
290905420002	Henry Johnson	13.5
200905420001	Esther Roche Trust	12.4
290905430007	Leroy Burns	12.1
160905340003	Dr. Pual Stuber	9.9
290905120005	Barbara Kochan	9.9
100905420003	Mark Schubert	9.6
0		9.6
100905130001	John Hancock Life Insurance CO #72	9.6
150905220001	Robert Jungers	9.5
251005220001	HT VII QRS Trust C/O Hancock	9.4
100905420001	Frank Schubert	9.3
210905220004	Ellen Blair	8.4
100905420003	Mark Schubert	8.2
290905120006	Martin Kochan	8.0
160905410001	Howard Jones Trust	7.9
200905120002	Corliss Florek	7.7
200905430003	Russell Durrah	7.7
160905420008	Anthony Silva	7.6
110905220001	John Hancock Life Insurance Co #72	7.3
290905430005	Roger Bedell	6.6
200905430005	Michael Grasseth	6.3
200905430002	Michael Wegdahl	6.2
290905130002	Larry Avalon	5.9
200905430004	Greg Bain	5.8

Cathlamet Watershed Property Ownership

PARCEL NUMBER	PROPERTY OWNER	ACRES
290905120003	Cory Cothren	5.8
290905130002	Larry Avalon	5.8
290905130003	Philip R. Riley	5.6
100905130001	John Hancock Life Insurance CO #72	5.5
110905210001	Robert Olsen	5.3
100905420003	Mark Schubert	5.3
290905430006	Roger Bedell	5.2
210905230001	Lawrence D. Rose	5.2
290905430010	Marvin Davenport	5.2
200905430012	Mary Schroder	5.2
100905420003	Mark Schubert	5.1
210905230001	Lawrence D. Rose	5.1
290905330004	David Tramblie	5.0
290905330004	David Tramblie	5.0
290905330015	James Wishon	5.0
290905120004	Rodger Baker	5.0
290905330004	David Tramblie	5.0
200905120002	Corliss Florek	5.0
290905120001	Michael Kochan	5.0
290905330013	William Corrigan	4.9
210905220008	Tim Crouse	4.7
290905210004	LaRue Heiner	4.7
290905130003	Philip R. Riley	4.4
210905220001	Steve Souvenir	4.3
290905130003	Philip R. Riley	4.3
0		4.2
210905220012	Joseph Minutella	4.1
210905220013	Todd Souvenir	4.0
150905210001	Bobby Dobbins	3.9
160905420004	Richard Lewis	3.7
290905130003	Philip R. Riley	3.7
200905430007	Olaf Thomason Jr.	3.7
290905330004	David Tramblie	3.5
290905130003	Philip R. Riley	3.4
290905110005	Billy Wren	3.3
290905330022	Michael Mussina	3.2
290905330002	Charles V. Smith	3.0
290905330004	David Tramblie	2.8
290905330004	David Tramblie	2.8
290905430009	Fred Wilen	2.8
200905430009	Marnee Davis	2.7
290905330005	Robert Tatum	2.6
290905430010	Marvin Davenport	2.5
290905430014	Leroy Burns	2.5
290905120004	Rodger Baker	2.5
290905120004	Rodger Baker	2.5
290905120004	Rodger Baker	2.5
290905120004	Rodger Baker	2.5
290905330012	Gerald Edwards	2.5
200905430008	Wells Fargo Financial Bank	2.5
290905330019	Lance Klecker	2.5
290905430013	Leroy Burns	2.4
150905230004	Wahkiakum County	2.4
290905430012	Leroy Burns	2.3

PARCEL NUMBER	PROPERTY OWNER	ACRES
290905130005	Robert Beyer	2.3
200905430010	Leon M. Thomas	2.3
290905430011	Fred Wilen	2.2
290905110002	John Florek	2.2
160905420007	Tony Silva	2.0
290905330018	Beaver Creek Entertainment LLP	1.9
160905340001	Steven Baker	1.9
160905340004	Eugene Tonda	1.9
210905220011	Richard Robinson	1.9
200905430006	Richard Acosta	1.8
290905120002	Billy Wren	1.8
150905230001	Dave Williams	1.6
210905220006	Jim Robinson	1.6
200905440001	Jeff Spath	1.6
290905120009	Glendoll Wren	1.6
170905410001	Manulife Insurance Co	1.5
160905420006	Roger Reed	1.5
0		1.5
100905430001	Michael S. Harley	1.4
160905410002	Gordon Spivemor	1.4
0		1.4
290905310002	Richard Imus	1.3
200905440005	Terry Heagy	1.3
290905330009	Robert Tatum	1.3
290905330017	Patrick Kulju	1.3
290905330006	Beaver Creek Enterprises LLP	1.3
210905220005	Lauren Tourville	1.2
100905410001	State of Washington Department of Game	1.2
210905230004	Michael Rose	1.2
290905340003	Jamie Jacobson	1.2
0		1.2
200905430006	Richard Acosta	1.1
290905310004	Duane McEneny	1.1
290905110002	John Florek	1.1
290905310005	Duane McEneny	1.1
290905340005	Leigh W. O'Malley	1.1
0		1.0
290905340001	Thomas Pfiefil	1.0
200905430012	Mary Schroder	1.0
290905330007	Sharon Devlin	1.0
290905330010	Beaver Creek Entertainment LLC	1.0
290905310003	Duane McEneny	1.0
290905430002	Gerald Knowles	1.0
290905430003	Kevin Patching	1.0
290905330008	William W. Wallace	1.0
290905430004	Jeff Tracy	1.0
290905210005	David Furuli	1.0
290905120007	Glendoll Wren	1.0
160905420001	Mario A. Valdizan	1.0
290905330021	Michael Mussina	1.0
290905330016	Michael R. Johnson	1.0
290905130003	Philip R. Riley	1.0
210905220002	Jim Robinson	1.0
290905330014	Michael Mussina	1.0

PARCEL NUMBER	PROPERTY OWNER	ACRES
290905130003	Philip R. Riley	0.9
290905430001	Gary Quigley	0.9
290905120008	Billy Wren	0.9
290905330020	Michael Mussina	0.9
210905220009	Clark Tourville	0.9
200905430003	Russell Durrah	0.9
210905230003	Robert Martin	0.9
170905440002	Walter Widman	0.9
200905110001	Corliss Florek	0.8
290905340004	Alfred Logston	0.8
290905130003	Philip R. Riley	0.7
200905440008	Michael Grasseth	0.5
290905130003	Philip R. Riley	0.5
160905330001	Walter Widman	0.5
200905430001	Russ Durrah	0.4
290905110002	John Florek	0.3
170905410001	Manulife Insurance Co	0.3
200905110003	Corliss Florek	0.2
200905110003	Corliss Florek	0.2
200905110003	Corliss Florek	0.2
200905110003	Corliss Florek	0.2
200905110003	Corliss Florek	0.2
200905110006	Dorthy Rose	0.2
200905110002	Terry Mace	0.2
200905110002	Terry Mace	0.2
200905110007	Dorthy Rose	0.2
200905110005	Dorthy Rose	0.2
200905110002	Terry Mace	0.2
200905110003	Corliss Florek	0.2
200905110003	Corliss Florek	0.2
290905130005	Robert Beyer	0.2
290905110004	State of Washington Dept. of Game	0.2
200905430007	Olaf Thomason Jr.	0.2
170905440003	George Hannigan	0.1
160905420002	State of Washington	0.1
170905440003	George Hannigan	0.1
200905430007	Olaf Thomason Jr.	0.1
200905430002	Michael Wegdahl	0.0
200905430001	Russ Durrah	0.0
200905430010	Leon M. Thomas	0.0
290905130003	Philip R. Riley	0.0
200905430008	Wells Fargo Financial Bank	0.0

APPENDIX C

WATER SYSTEM INTERLOCAL AGREEMENT

TOWN OF CATHLAMET WATER SYSTEM

AND

PUBLIC UTILITY DISTRICT NO. 1 OF WAHKIAKUM COUNTY, PUGET ISLAND WATER SYSTEM

INTERLOCAL WATER SUPPLY CONTRACT

OCTOBER 15, 1996

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TOWN OF CATHLAMET AND PUGET ISLAND WATER SYSTEM INTERLOCAL WATER SUPPLY CONTRACT

INTERLOCAL WATER SUPPLY CONTRACT

THIS AGREEMENT originally made and entered into the 21st day of June, 1988, and re-executed this 21st day of October, 1996 to effectuate a modification of the prior agreement, executed by and between the **TOWN OF CATHLAMET**, a municipal corporation organized and existing under the laws of the State of Washington, hereinafter referred to as the Town and **PUBLIC UTILITY DISTRICT NO. 1 OF WAHKIAKUM COUNTY**, a municipal corporation organized and existing under the laws of the State of Washington, hereinafter referred to as the District.

WITNESSETH:

The Town is a municipal corporation of the fourth class situate within Wahkiakum County and is presently engaged in the production, sale and distribution of water through its municipal water system. The District operates a water distribution system on Puget Island in Wahkiakum County and, pursuant to contract dated November 21, 1977, has been purchasing water from the Town for the supply to the Puget Island Water System of the District. The Town desires to extend the aforementioned contract of November 21, 1977, with minor modifications, in order to insure that the revenues derived from said contract at all times exceed the costs of producing the water so supplied. The District desires to extend the aforementioned contract of November 21, 1977, with minor modifications, in order to insure that its Puget Island Water System has a long term supply agreement which among other things will qualify the District for long term financing. The Parties to this contract have met and determined that certain efficiencies can be obtained by contracting to have the Town provide all the water to the District for its Puget Island Water System. The Parties have further determined that the rate charged to the District should be directly related to the costs incurred by the Town in producing the water so supplied. The Town is authorized to enter into this Contract under the provisions of Section 35.92.200 of the Revised Code of Washington. The District is authorized to enter into this Contract under the provisions of Section 54.16.090 of the Revised Code of Washington. This cooperative agreement is further authorized by the provisions of Chapter 39.34 of the Revised Code of Washington, the Interlocal Cooperation Act.

The parties acknowledge that in 1996 the Town was directed by the United States Department of Agriculture, Rural Utilities Service to renegotiate a contract with the District that is fair, equitable and to the benefit of both utilities as a requirement of the Town obtaining loan, grant and public works trust fund moneys totaling approximately $2,884,000 to make improvements to its water system.

NOW THEREFORE, pursuant to the needs of the District, the mutual desire of the parties to accomplish the efficiencies inherent in this cooperative agreement, and the specific statutory authority above referred to, the Town and the District, for and in consideration of the promises herein made, and the mutual benefits to be derived herefrom do hereby agree as follows:

1.0. STATEMENT OF AGREEMENT

The Town agrees to sell to the District and the District agrees to purchase from the Town, at the Point of Delivery, as said term is hereinafter defined, all water necessary for the maintenance and operation of the District's Puget Island water distribution system, in accordance with and subject to the terms and conditions of this Contract. The District agrees to purchase one hundred percent (100%) of the water requirements of its Puget Island Water System from the Town.

2.0 TERMS AND DEFINITIONS

2.01 Point of Delivery: As used in this Contract, the term "point of delivery" shall mean the point within the unimproved alley extending east of the Puget Island Bridge, between Columbia and Front Streets, where the Town is presently delivering water to the District in accordance with a written agreement dated November 21, 1977.

2.02 Maintenance Costs: Maintenance costs shall mean those day-to-day costs of maintaining the Town's water production plant and distribution system in good working order. Maintenance costs shall not include any expenditures that would normally be capitalized under generally accepted principles and practices of accounting.

2.03 <u>Capital Expenditures</u>: Capital expenditures shall mean those expenditures incurred by the Town in acquiring water system assets that have a useful life extending longer than one (1) year and that would normally be capitalized under the standards of Generally Accepted Accounting Principles and practices of accounting. The District's share of capital expenditures incurred in constructing new additions to the Town's water system shall be calculated according to the terms and provisions of this Contract as set-forth in Exhibit B.

(5) 2.04 <u>Primary Line</u>: The Primary Line shall consist of the footage of the Town's water pipe line that serves as the most direct route from the Town's filtration plant to the Point of Delivery as set-forth in Exhibit A. The Primary Line is traced in marks "0-0-0-0" on the system's facility map that is attached hereto and marked as Exhibit "A". By this reference, the said Exhibit "A" is incorporated herein as though fully set forth at length at this point. The footage may be reviewed upon completion of the final 1996-7 engineering plan up-date for the Town's water system.

2.05 <u>Primary Alternate Line</u>: The Primary Alternate Line is that part of the Town's water pipe line that can be used to supply water to the Point of Delivery in the event that there is a break in or other destruction of the Primary Line. The Primary Alternate Line is traced in "X-X-X-X" on the system's facility map that is attached hereto and marked as Exhibit A which is incorporated herein. At the date of execution of this Contract, the Primary Alternate Line consists of the footage of the Town's water pipe line as set-forth in Exhibit A and Exhibit D. In the event that future developments render any portion of the now existing Primary Alternate Line unneeded as an alternate supply route to the Point of Delivery, or if where the Primary Alternate Line becomes primarily a customer distribution line and secondarily an alternate stand-by line, then the District shall have the right to demand a downward adjustment to the number of feet of the water pipe deemed to be part of the Primary Alternate Line. In order for either the Town or the District to exercise its right to make adjustments to the amount of pipe classified as Primary Alternate Line, written notice of the requesting party's revised computation of the Primary Alternate Line footage must be given to the other Party on or before the first day of August of any year of the contract term. The other party shall respond on or before the first day of September.

2.06 <u>District Percentage</u>: The District Percentage shall mean the quotient arrived at when the total amount in cubic feet of the District's water purchases in one year is divided by the total amount in cubic feet of the water produced by the Town's water production plant as metered at the plant during the same one year period. The District Percentage shall be recomputed annually, prior to the first day of August based upon data collected from the immediately preceding twelve-month period ending on the 30th day of June of the recomputation year. Monthly the Town shall provide the District with the total water produced as measured by the meter at the Plant, which total may be endorsed upon the water billing from the Town to the District.

2.07 <u>Pipe Line Depreciation Factor</u>: The Pipe Line Depreciation Factor is a mutually agreed upon depreciation factor computed by multiplying the cost of one foot of pipe at its 1967 installation cost of $4.1393 by a depreciation factor of 0.02 for the fifty-year life attributable to water pipe lines. The Pipe Line Depreciation Factor is hereby fixed at $0.0828 per foot of pipe per year, until the year 2017. For newly installed primary or alternate primary pipelines the depreciation factor shall be calculated upon the cost and useful life of said new pipeline and shall be converted to a per-foot unit.

2.08 <u>Reservoir Depreciation Factor</u>: The Reservoir Depreciation Factor shall be $717.30 per year based upon the original cost of the reservoir depreciated over 50 years until the year 2017. In the event that additional Reservoirs are placed in service after the effective date of this Contract, then in that event the Reservoir Depreciation Factor shall be adjusted taking into consideration the cost and useful life of each such reservoir. The Town shall give the District written notice of any proposed adjustments to the Reservoir Depreciation Factor by the first day of August. The District shall have until the first day of September to serve written objections to such proposed adjustments.

2.09 Reserved.

2.10 Reserved.

2.11 Plant Depreciation Factor: This is the amount attributed to the annual depreciation of the components constituting the Town's water plant, exclusive of water pipe lines and reservoirs. The Plant Depreciation Factor shall be computed annually by reference to the Plant Depreciation Schedule which is annexed hereto and marked as Exhibit "B". Said "Exhibit B" is by this reference incorporated herein as though fully set forth at length at this point. The parties hereto accept and ratify the accuracy of said Plant Depreciation Schedule. By way of illustration, the Plant Depreciation Factor for 1996 is $5,012.00.

In event that the Town incurs capital expenditures in making additions or betterments to its water plant, then in that event an appropriate addendum or addenda shall be made to the Plant Depreciation Schedule. Such addendum or addenda shall be taken into account in calculating the Plant Depreciation Factor during the annual Recomputation of the Cost of Production. Such addendum or addenda shall be made in the same format as the original Plant Depreciation Schedule set forth in Exhibit "B" hereto.

Proposed Addenda to the Plant Depreciation Schedule may be drafted b the Town and submitted in writing to the District on or before the first day of August of any year during which this contract is in effect. The Town shall submit supporting calculations and cost data with any such proposed Addenda. The District shall have until the first day of September to review said proposed addendum or addenda and to submit any objections thereto, in writing, to the Town. In the event that the District does not object within the time provided herein, the proposed addendum or addenda shall automatically take effect and become part of the Permanent Plant Depreciation Schedule and shall be deemed incorporated into this Contract.

It is the intent of the parties that only plant additions or betterments which directly or indirectly benefit the District should be included in computing the Plant Depreciation Factor for purposes of this Contract.

2.12 Labor Costs: Labor costs shall be computed on the hourly rate of the Town's water Department employees including fringe benefits. The number of hours of labor shall be based upon time records maintained by the Town's water superintendent/director of public works showing the approximate time per day spent by the Town's water department employees in maintaining the Town's water plant and those parts of the Town's distribution system that give benefits to the District. The hourly rate shall be computed based upon the Department employee's salaries as projected in the Town's budget for the next succeeding year subject to the adjustment factor. Hours of labor expended shall be recomputed annually, prior to the first day of August based upon the superintendent/director of public work's time records for the immediately preceding twelve-month period ending on June 30 of the recomputation year. The superintendent/director of public works in calculating time expended shall be allowed to adjust actual hours upward to reflect increased costs to the Town based upon its policy of giving water department employees compensatory time off in lieu of overtime payments.

2.13 <u>Plant Operating Costs</u>: Plant Operating Costs shall mean those costs incurred by the Town in the day-to-day operation of its Filtration Plant excluding labor costs as set-forth in Section 2.12. Plant Operating Costs shall include expenses incurred for power, telemetering and telephone, chemicals, lab supplies, machinery maintenance costs, health department required testing, audit costs computed at the District's percentage rate as set-forth at Section 2.06 of the total audit costs, insurance costs associated with the water system, vehicle costs, and other miscellaneous costs of a similar nature. Plant Operating Costs shall be recomputed annually, before the first day of August by the Town's water superintendent/director of public works based upon his or her best estimates and projections of Plant Operating Costs for the next succeeding calendar year. The Superintendent/Director of Public Works shall also take into account the historical Plant Operating Costs in making his or her projections.

2.14 <u>Telephone and Telemetering Costs</u>: Telemetering Costs are an element of Plant Operating Costs and shall be computed by taking the actual costs expended by the Town for its telemetering system. Add to that amount 80% of the annual telephone bill incurred by the water plant telephone which is also an element of the Plant Operating Costs.

2.15 <u>Vehicle Costs</u>: Vehicle costs relate to expenses incurred in operating the Town's water department vehicles in travel to and from the Town's Water Filtration Plant. Costs shall be computed on the basis of 150 miles per month multiplied by the applicable standard mileage rate recognized by the Internal Revenue Service for business use of vehicles. In the event that the Internal Revenue Service ceases to recognize a standard mileage rate, the parties shall mutually agree upon some other generally recognized vehicle expense reimbursement rate.

2.16 Reserved.

2.17 <u>Fixed Costs</u>: Fixed Costs shall mean all of those costs set forth in this Section 2 as fixed numbers with no provisions for recomputation.

2.18 <u>Variable Costs</u>: Variable Costs shall mean all of those costs that Section 2 provides and shall be recomputed annually.

2.19 <u>Adjustment Factor</u>: Adjustment Factor shall mean that factor designed to protect both parties from unanticipated changes in market conditions that could not be adequately gauged at the time of the annual computation of the Cost of Production provided for in this contract. The Adjustment Factor shall be computed annually as of the last day of June by calculating the difference between the variable costs actually incurred in the immediately preceding twelve-month period ending June 30th and the variable costs as estimated for the prior year ending June 30th and provided by the Town to the District by the 1st day of August. In the event that the actual variable costs exceed the estimated variable costs, then the District shall pay the Town a lump sum adjustment calculated as follows: the amount by which the actual variable costs exceed the estimated variable costs multiplied by the District's percentage (calculated in accord with paragraph 2.6). plus 10% of the product so calculated. In the event that the estimated variable costs exceed the actual variable costs, then the Town shall pay the District a lump sum adjustment factor calculated as follows: the amount by which the estimated variable costs exceed the actual variable costs multiplied by the District's percentage (calculated in accord with paragraph 2.06)

2.20 <u>Total System Feet</u>: Total System Feet shall mean the total number of feet of water pipe line in the Town's entire distribution system. The Total System Feet on the date of this Contract is declared and agreed to be the footage set-forth in Exhibit A and Exhibit D Total System Feet shall be increased annually to reflect pipe line additions to the Town's water system.

2.21 Cost of Production: The Cost of Production shall mean the cost incurred by the Town in producing and delivering to the Point of Delivery 100 cubic feet of water. The Cost of Production shall be computed annually, before the first day of August using the factors defined in this Section 2 and by applying to those factors the following fourteen step formula, with all initial calculations being extended to four decimal places:

Distribution Segment

(a) Multiply the Primary Line footage by the Pipe Line Depreciation Factor.

(b) Multiply the Primary Alternate Line footage by the Pipe Line Depreciation Factor.

(c) The Reservoir Depreciation Factor is fixed at $717.30 per year for the 1967 reservoir.

(d) Reserved.

(e) Calculate Maintenance Costs attributable to the Primary Line and the Primary Alternate Line by dividing the annual Labor Costs incurred in maintaining the water pipe lines, valves, and reservoirs, by the Total System Feet to yield a maintenance cost per foot of pipe per year. Then multiply the maintenance costs per foot by the total footage contained in the Primary Line and the Primary Alternate Line.

(f) Calculate the Total Distribution Costs by taking the sum of the numbers calculated in steps (a) thru (e).

(g) Divide the sum calculated in step (f) by the total cubic feet of water produced by the Town Water Plant in the immediately preceding twelve month period ending on the 30th day of June. Then multiply the quotient so calculated by 100 to achieve a distribution cost of production per 100 cubic feet of water.

Manufacturing Segment:

(h) Calculate the Labor Costs attributable to maintaining the Town's water filtration plant.

(i) Calculate the Plant Operating Costs.

(j) Reserved.

(k) Calculate the Plant Depreciation Factor per Exhibit B..

(l) Calculate the Total Manufacturing Costs by taking the sum of the numbers calculated in steps (h) thru (k).

(m) Divide the sum calculated in step (l) by the total cubic feet of water produced by the Town's water plant in the immediately preceding twelve month period ending on June 30. Then multiply the quotient so calculated by 100 to achieve a manufacturing cost of production per 100 cubic feet of water.

Summation Segment:

(n) Take the sum of the distribution costs and manufacturing costs by adding together the numbers arrived at in steps (g) and (m). Round the answer so calculated to the nearest quarter cent ($0.0025). This is the Cos of Production.

2.22 Cost of Production - 1996: Exhibit D is agreed by the parties to be a correct application of the formula set forth in Section 2.21 in computing the Cost of Production for 1996 and is the formula to be used to compute the following year rate.

3.0 PURPOSE

It is mutually agreed that the water purchased by the District is for resale to consumers now or hereafter connected to the water service mains of the District and will be used by such consumers for domestic, industrial or agricultural purposes and not resold by said consumers.

4.0 TERM

This Contract shall take effect the first day of January, 1997 and shall continue in full force and effect from said date for a term of forty (40) years, to-wit: until midnight on December 31, 2037. Either party may request renegotiation at any time after the first day of January, 2007, and at every five year period thereafter. Any dispute with respect to renegotiation shall be governed by the arbitration provisions of Section 10.

5.0 DELIVERY AND METERING

5.01 <u>Delivery</u>: The Town shall deliver the water purchased by the District to the Point of Delivery through the Town's distribution lines.

5.02 <u>Metering</u>: All water purchased by the District, pursuant to this contract, shall be metered at the point of delivery. The Town shall install and maintain a six-inch (6"), or larger, meter at the Point of Delivery for the purpose of measuring the water so delivered.

5.03 <u>Meter Calibration</u>: The meter at the Point of Delivery shall be tested for accuracy and calibrated annually by a qualified technician according to such standards as may be provided in Washington State Law. The Cost of such annual test and calibration shall be shared equally by the parties hereto.

5.04 <u>Meter Replacement</u>: In the event that it is determined by the annual test, or otherwise, that the meter at the Point of Delivery should be replaced, then in that event the cost of a replacement shall be shared equally by the parties. The Town's labor costs shall not be included in the cost of production formula.

6.0 RATES

6.01 <u>Basic Rate</u>: The District shall pay to the Town the following rate for all water delivered to the District through the meter at the Point of Delivery: The cost of Production as calculated pursuant to the formula set out in Section 2.21 of this Contract plus an additional ten percent (10%) thereof, rounded to the nearest quarter cent per 100 cubic feet of water.

6.02 Reserved.

6.03 <u>Billing and Payment</u>: The Town shall bill the District within ten days after the close of each calendar month for the water delivered to the District during the month. The District shall pay the Town for the delivery of such water at the rate set forth in this Section within fifteen (15) days of the presentation of the Town's bill therefor.

6.04 Payment of Lump Sum Adjustment Factor: The lump sum adjustment factor calculated in accordance with paragraph 2.19 of this contract shall be paid by the District or refunded by the Town on or before the last day of September of each year. The Town's computation of the lump sum adjustment factor shall be submitted to the District on or before the first day of August of each year and the District's rights to review and/or challenge said computation shall be the same as those rights set forth in paragraph 7.1 of this contract with respect to the annual recomputation of the cost of production.

7.0 ADJUSTMENT TO RATES

7.01 Cost of Production Recomputed Annually: Using the formula set forth in Section 2.21, the Town's cost of production shall be recomputed annually. The Town through its water superintendent/director of public works or other designee shall submit to and meet with the District, on or before the first day of August of each year during which this contract is in effect to review with the District its revised computation of the Cost of Production togetherwith supporting calculations and a summary of historical cost data for the twelve-month period ending on the immediately preceding June 30th. The District shall have until the first day of September to review said revised computation of the Cost of Production and to submit any objections thereto, in writing, to the Town. The District shall be afforded an opportunity to inspect any data relevant to the Cost of Production that may be in the Town's exclusive possession. In the event that the District does not object within the time provided herein, the Cost of Production so submitted by the Town shall automatically go into effect on January 1st of the next calendar year. Any disputes regarding the computation of the Cost of Production shall be resolved by the negotiation and arbitration remedies set forth in Section 10 of this Contract. The arbitration of the Cost of Production shall be completed by the first Monday of December. The revised Cost of Production shall take effect each January 1 during the Contract term.

7.02 Interim Emergency Adjustments: In the event that the District's consumption increases in excess of 15% over the same month in the immediately preceding year and that said increase continues for a period of three (3) consecutive months, or in the event that the District creates a demand that exceeds the Town's ability to supply based upon its then existing facilities, the Town shall have the option of recomputing the Cost of Production to take effect prior to the January 1 recomputation effective date described in Paragraph 7.1. Upon the failure of the District to submit written objections to the Town's recomputation within thirty (30) days of the District's receipt of the said interim recomputation of the Cost of Production, said interim recomputation shall take effect immediately. Any disputes concerning the interim recomputation shall be resolved through the negotiation and arbitration remedies set forth in Section 10 of this Contract within sixty (60) days of the District's receipt of the said interim recomputation.

8.0 PERFORMANCE AND IMPOSSIBILITY

It is understood and agreed that the Town shall not be liable for failure to deliver a sufficient supply of water to the District resulting from unforeseeable conditions beyond the Town's control, which shall include, but not be limited to: acts of God, insufficient supply, drought, hostile diversion or obstruction, forcible entry, temporary damage by flood or other unavoidable accident, and any additional demand by the District exceeding the Town's ability to supply based on the Town's then existing capacity, and the Town shall use all due diligence in maintaining, restoring and protecting the delivery of water to the District. In the event that the Town declares a moratorium on new hook-ups to its water system based upon an insufficient supply of water, the Town and the District agree to abide by such moratorium and to jointly develop rules governing the moratorium which are non-discriminatory.

9.0 LIABILITY

9.01 Indemnity to Town: The District shall and does assume the responsibility for water distributed by it from the Point of Delivery and at all points thereafter, and it will defend, protect and save harmless the Town from all claims for injury or damage to persons or property occasioned by the use of such water upon its distribution from such facilities as are or may be owned and used by said District for the distribution thereof by the District and will indemnify the Town with respect to all costs and expenses whatsoever, including attorney's fees, incurred in connection with or as a result of any and all claims for any such injury or damage arising by, through or from the negligence of the District.

9.02 Indemnity to District: The Town shall and does assume a... responsibility for and warrant the water produced and distributed by it to the Point of Delivery and will defend, protect and save harmless the District from all claims for injury or damage to persons or property occasioned by the purchase and resale of such water by the District as to the condition of said water at the Point of Delivery and will indemnify the District with respect to all costs and expenses whatsoever, including attorney's fees, incurred in connection with or as a result of any and all claims for any such injury or damage arising by, through or from the production of said water by the Town. The Town does not by this indemnification grant to any individual user of the District's Puget Island Water System any cause of action or warranty, nor assume any liability, that would not exist in the absence of the existence of this indemnification clause.

10.0 ARBITRATION

10.01 Exhaustion of Remedies: In the event that either the Town or the District determines that a genuine issue exists with regard to the interpretation of and/or any computation of this contract, or that such a genuine issue exists with regard to the noncompliance by either party with respect to any term of this Contract, then the aggrieved party shall forthwith arrange a meeting of representatives of the Town and of the District. The purpose of this meeting shall be to allow the representative or representatives from both parties to present their views with respect to the interpretation and/or computation issue or the issue of alleged noncompliance. The representatives at this meeting shall in good faith attempt to reach an amicable resolution of any controversy. Neither party shall invoke the arbitration remedy provided for herein until the meeting provided for in this Section has been conducted, or unless one party refuses to attend said meeting.

10.02 Arbitration: In the event that the Town and District representatives meeting pursuant to provision 10.1 of the Contract cannot reach a mutually agreed upon resolution of the interpretation and/or computation issue or issue of alleged noncompliance, then the aggrieved party may invoke the remedy of arbitration. Arbitration shall be conducted before a three-person arbitration panel composed of one person designated by the Council of the Town of Cathlamet, and one person designated by the Board of Commissioners of Public Utility District No. 1 of

Wahkiakum County, and the third panel member designated by the other two panel members. The arbitration shall be conducted in accordance with the rules of the American Arbitration Association and the decision and award of the Arbitration panel shall be final. The parties may jointly agree to vary the rules of arbitration.

11.0 Reserved.

12.0 ASSIGNMENT PROHIBITED

This Contract may not be assigned by either party hereto, or by operation of law, without prior written consent of the other party.

13.0 NOTICES AND LITIGATION

13.01 Notices: Any notice or application required or authorized to be given under this Contract shall be deemed complete when mailed by one party to the then current address of the other party by registered mail, postage prepaid.

13.02 Attorney's Fees: Should either party be forced to litigation in the enforcement of the terms of this Contract, the prevailing party shall be entitled to a recovery of a reasonable attorney's fee to be set by the court or arbitrator.

14.0 EXECUTION

Signatories: The parties hereto have executed this Contract the day and year first above written.

IN WITNESS WHEREOF, the District has at a properly called Regular Meeting of its Commission on the 15th day of October 1996, approved and executed this Contract and has caused it to be spread upon the minutes book of the District and the Town has at a regular meeting of its Council on the 21st day of October, 1996, approved the Contract and caused it to be executed by its Mayor and Town Clerk and has caused it to be spread upon the minute book of the Town.

TOWN OF CATHLAMET, By:

PUBLIC UTILITY DISTRICT NO. 1 OF WAHKIAKUM COUNTY, WASHINGTON, By:

William Schwarze, Mayor

Arne O. Torget, President

Attest:

Vivian Olsen, Town Clerk

Richard A. Riley, Secretary

Approved as to Form this 22nd day of October, 1996:

Approved as to Form this 15th day of October, 1996:

William J. Faubion
Town Attorney

George F. Hanigan
Attorney for P.U.D. #1

Recommended for approval:

Keneth G. Bauerle, Manager

FIRST ADDENDUM
TO INTERLOCAL WATER SUPPLY CONTRACT OF 1996
BETWEEN THE TOWN OF CATHLAMET AND
PUBLIC UTILITY DISTRICT NO. 1 OF WAHKIAKUM COUNTY

THIS AGREEMENT made and entered into this 19th day of July, 2000, by and between the TOWN OF CATHLAMET, a municipal corporation organized and existing under the laws of the State of Washington, hereinafter referred to as the Town and PUBLIC UTILITY DISTRICT NO. ONE OF WAHKIAKUM COUNTY, a municipal corporation organized and existing under the laws of the State of Washington, hereinafter referred to as the District.

This addendum reflects agreed upon changes to the following items in the current Interlocal contract and the rate calculation methodology used to determine the appropriate % and per cubic foot cost to be paid to the Town of Cathlamet by the PUD.

WITNESSETH:

1. <u>Primary Alternate Line: - Section 2.05</u> This Section is amended to read as follows:

The Primary Alternate Line (15,200 feet) is replaced by the "New Primary Alternate Line" of 19,327 feet and is that part of the Town's water pipe line that can be used to supply water to the Point of Delivery in the event that there is a break in or other destruction of the Primary Line. The New Primary Alternate Line is traced in triangles on the system's facility map that is attached hereto and marked as Revised Exhibit "A" which is incorporated herein. At the date of execution of this Addendum, the New Primary Alternate Line consists of the footage of the Town's water pipe line as set-forth in Revised Exhibit "A" and Revised Exhibit "D". In the event that future developments render any portion of the now existing Primary Alternate Line unneeded as an alternate supply route to the Point of Delivery, or if where the Primary Alternate Line becomes primarily a customer distribution line and secondarily an alternate stand-by line, then the District shall have the right to demand a downward adjustment to the number of feet of the water pipe deemed to be part of the Primary Alternate Line. In order for either the Town or the District to exercise its right to make adjustments to the amount of pipe classified as Primary Alternate Line, written notice of the requesting party's revised computation of the Primary Alternate Line footage must be given to the other Party on or before the first day of August of any year of the contract term. The other party shall respond on or before the first day of September.

2. <u>Pipe Line Depreciation Factor: - Section 2.07</u> This Section is amended to read as follows:

The Primary Line Depreciation Factor is hereby fixed at $0.0828 per foot of pipe per year, until the agreed length of depreciation is exhausted in the year 2017.

The Primary Alternate Line Depreciation Factor is hereby fixed at $07868 per foot of pipe per year (19,327), until the agreed length of depreciation is exhausted in the year 2047 or the expiration of this contract, whichever occurs first. This depreciation amount is multiplied by 65% (PUD allocated share) to arrive at the depreciation dollars used in the rate computation.

For newly installed primary or alternate primary pipelines, as agreed upon by both parties, the depreciation factor shall be calculated upon the cost and useful life of said new pipeline and shall be converted to a per-foot unit.

3. <u>Reservoir Depreciation Factor: - Section 2.08</u>This Section is amended to read as follows:

The Reservoir Depreciation Factor shall be $717.30 per year based upon the original cost of the reservoir depreciated over 50 years until the year 2017.

The Kents Bridge Reservoir Depreciation Factor shall be $4,846.25 per year based upon the original cost of the reservoir, until the agreed length of depreciation is exhausted in the year 2047 or the expiration of the Interlocal contract, whichever occurs first.

The Town shall give the District written notice of any proposed adjustments to either of the Reservoir Depreciation Factors by the first day of August. The District shall have until the first day of September to serve written objections to such proposed adjustments.

4. <u>Cost of Production: - Section 2.21</u> Add the following language to Section (d):

(d) The Kents Bridge Reservoir Depreciation Factor is fixed at $4,846.25 per year, until the agreed length of depreciation is exhausted in the year 2047 or the expiration of the Interlocal contract, whichever occurs first.

5. <u>Exhibit D - Rate Calculation:</u> Replace current Exhibit "D" with the attached Revised Exhibit "D".

IN WITNESS WHEREOF, the District has at a properly called Regular Meeting of its District Commission on the 19th day of July, 2000, approved and executed this Contract Addendum and has caused it to be spread upon the minutes book of the District and the Town has at a regular meeting of its Council on the 17th day of July, 2000, approved the Contract and caused it to be executed by its Mayor, Deputy Town Clerk and appropriate members of the Town Council and has caused it to be spread upon the minutes book of the Town.

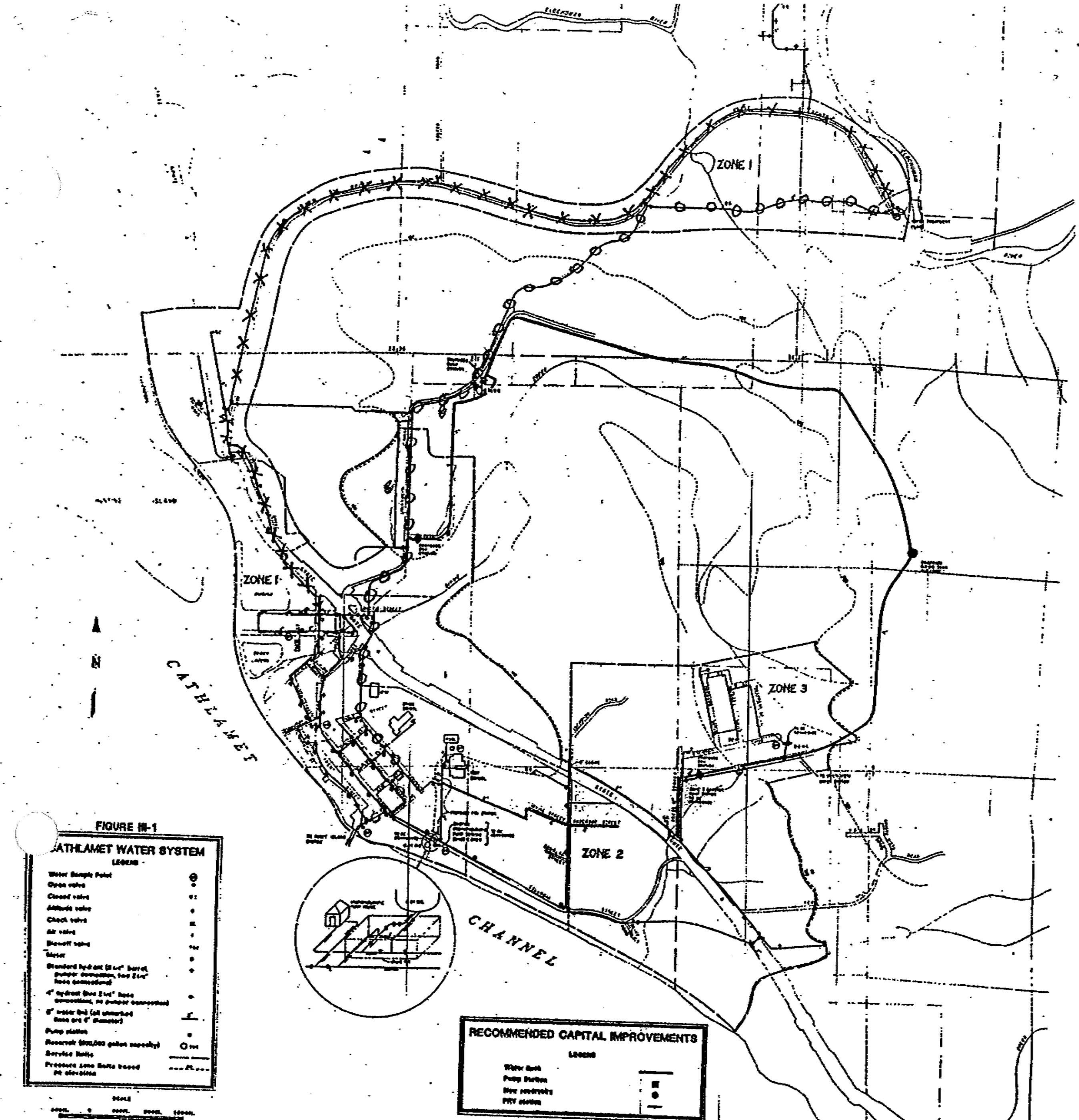


EXHIBIT "A"

0-0-0-0 = PRIMARY LINE
X-X-X-X = PRIMARY ALTERNATE LINE

EXHIBIT "B"

PLANT DEPRECIATION SCHEDULE
REVISED 10-15-95

ASSET	YR. PLACED IN SERVICE	COST	USEFUL LIFE YEARS	YRS. REMAIN	ANNUAL DEPRECIATION
Plant Structure & Piping	1967	$45,410.	30	2	$1,514.
Wash Water Pond	1981	$11,354.	30	16	$ 378.
New Pump	1982	$ 5,000.	20	7	$ 250.
Raw Water	1986	$12,035.	15	6	$ 802.
Stream Current Monitor	1993	$ 9,746.	10	8	$ 975.
Status Tube Mixer	1993	$ 1,485.	5	3	$ 297.
Flow Meter	1993	$ 1,914.	10	8	$ 191.
Auto Backwash	1993	$ 553.	5	3	$ 111.
Fluoride Saturator	1994	$ 1,134.	5	4	$ 227.
Water Plan Review Fee	1995	$ 1,600.	6	4	$ 267.

TOTAL $5,012.00

EXHIBIT "C"

P.U.D. WATER CONTRACT

PLANT OPERATING COSTS

	PROJECTED 1995	ACTUAL 1995	PROJECTED 1996
POWER	22407.00	25,304.00	26,570.00
TREATMENT CHEMICALS	4,000.00	6,170.86	6,479.00
LAB	1,000.00	1,414.62	1,485.00
CABLE/PHONE	1,000.00	619.20	650.00
FLUORIDE TESTS	170.00	--0--	--0--
ANNUAL SAMPLES	650.00	640.00	672.00
INSURANCE	1,200.00	729.00	765.00
RIP RAP AMORT.	450.00	450.00	450.00
AUDIT COSTS	--0--	--0--	2,808.00
PLANT MAINT.	8,000.00	9,302.84	9,768.00
BACT. TESTS	750.00	965.00	1,013.00
DISCHARGE	2,500.00	3,261.00	3,424.00
PERMIT FEES			
VEHICLE COSTS	1,300.00	1,630.12	1,712.00
OTHER ENG.	3,107.00	3,818.40	3,800.00
STATE COMPLIANCE STUDY	--0--	--0--	--0--
CERTIFICATION RENEWAL	100.00	50.00	100.00
WATER RIGHTS	--0--	--0--	--0--
TOTALS	$47,345.00	$54,355.04	$59,696.00

TOTAL PRODUCTION ______________________ CU. FT.

P.U.D. USAGE ______________________ CU. FT.

P.U.D. PERCENTAGE ________________

EXHIBIT "D"
SUMMATION SEGMENT

Cost of Production for the year ___1996___. The following is agreed by the parties to be a correct application of the formula forth in Section 2.21.

(A) Primary Line (**15,700** ft) x Pipe Line Depr. Factor (**$.0828**) = A $_1,299.96_

(B) Primary Alt. Line (17,230 ft) x Pipe Line Depr. Factor (**$.0828**)= B $_1,426.64_

(C) Reservoir Depreciation Factor (**$717.30**) C $__717.30___

(D) -0-

(E) Annual Labor Costs for Pipe Maintenance is __520____ hours at $__14.98____ per hour divided by Total System feet (___62,380____) yields Maintenance Cost per Ft. of $__.1249_____ multiplied by total footage in Primary Line and Primary Alternate Line (32,930) = E $_4,114.08_

(F) Total Cost of Production $__1,299.96_ (A) + $_1,426.64__ (B) + $_717.30____ (C) + $_4,112.08__ (E) = F $_7,555.98_

(G) Total Distribution Cost per 100 C.F. of water $__7,555.98_____ (F) divide by total production __13,828,877____ cu. ft. x 100 = G $_.0546____

(H) Total Labor Cost: total hrs__1196____ x $__14.98___ per hour = H $_17,916.08_

(I) Plant Operating Costs = I $_59,696___

(J) -0-

(K) Plant Depreciation Factor Per Exhibit "B" = K $_5,012____

(L) Total Manufacturing Cost: $__17,916.08___ (H) + $__59.696______ (I) + $__5,012_____ (K) = L $_82,624.08_

(M) Total Manufacturing cost per 100 cf of water $__82,624.08____ (L) divided by total production __13,828,877___cu. ft. X 100 = M $_.5975____

(N) Cost of Production: Take the sum of the Total Distribution Costs (G) $__.0546___ and the Total Manufacturing Costs and (M) $__.5975___ rounded to the nearest quarter cent = N $_.6521___

PIWS RATE for 19_96__:

Cost of Production per 100 cf of water $ __.6521____ x 1.10 = $.7173____

Town of Cathlamet Water Rates

for Puget Island Water System

EXHIBIT "D"

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
Year	PIWS Rate	% Chg	Total Usage PIWS	Total Production Town	Total Town Footage	Primary Line Footage	Primary Alternate Line Footage	Maint Hours	Labor Hours	Hourly Rate	Total Labor Cost	Annual Pipe Maint Cost	Pipeline Depr. Factor	Primary Pipeline Depr. $$	Pri. Alt. Pipeline Depr.$$	Reservoir Depr. Factor	Pipe Maint Cost	Total Dist. Cost	Dist Cost $/100cf	Projected Plant Operating Cost	Plant Depr. Factor	Total Operating Cost	Total Operating Cost $/100cf	Cost of Production
	24*1.1										H			A	B	C	E	F	G	I	K	L	M	N
											9*10	8*10		6*13	7*13		12/5*(6+7)	14+15+16+17	18/4*100			20+21+11	22/4*100	19+23
1996	0.7173		4,392,368	13,828,877	62,380	15,700	17,230	520	1,196	$14.98	$17,916.08	$7,789.60	$0.0828	$1,299.96	$1,426.64	$717.30	$4,112.08	$7,555.98	$0.0546	$59,696	$5,012	82,624.08	0.5975	0.6521
1997	0.0000																							
1998	0.0000																							
1999	0.0000																							
2000	0.0000																							
2001	0.0000																							
2002	0.0000																							
2003	0.0000																							
2004	0.0000																							
2005	0.0000																							
2006	0.0000																							
Average	0.0652																							

saved as: TOCRATES

EXHIBIT "E"

APPROVAL OF EXHIBITS A,B,C, & D
19_____

TOWN OF CATHLAMET

William R. Schwarz
MAYOR

[signature]
TOWN CLERK

10-22-96
DATE

PUBLIC UTILITY DISTRICT NO. 1
OF WAHKIAKUM COUNTY, WASHINGTON

____
PRESIDENT

____
MANAGER

____
DATE

EXHIBIT "F"

ANNUAL ADJUSTMENT FACTOR.

The annual adjustment factor calculated in accordance with paragraph 2.19 of this contract shall be paid on or before September 30th, of each year. The TOWN'S computation of the annual adjustment factor shall be submitted to the DISTRICT on or before the 1st day of August of each year and the DISTRICT'S rights to review and/or challenge said computation shall be the same as those rights set forth in paragraph 7.1 of this contract with respect to the annual recomputation of the "cost of production".

_____ Estimated Costs _____ Actual Costs Difference

$ ____________ minus $ ____________ = $ ____________

If difference is negative then: $ ____________ (Difference) x ____________ (PUD %) x 1.10 = $ ____________ (Lump Sum Adjustment Paid to Town)

If difference is positive then: $ ____________ (Difference) x ____________ (PUD %) x 1.10 = $ ____________ (Lump Sum Adjustment Paid to PUD)

TOWN OF CATHLAMET

PUBLIC UTILITY DISTRICT No. 1
OF WAHKIAKUM COUNTY, WASHINGTON

____
MAYOR

____
PRESIDENT

____
TOWN CLERK

____
MANAGER

____
DATE

____
DATE

MEMORANDUM OF AGREEMENT

WHEREAS, the Town of Cathlamet is a municipal corporation of Wahkiakum County and the purveyor of water to the residents of the Town of Cathlamet and much of the surrounding County; and

WHEREAS, from time to time emergencies arise due to inclement weather and/or breakdown of equipment resulting in the loss of electrical power to the Town water treatment facility; and

WHEREAS, the public health, safety and welfare may be adversely impacted by such outages; and

WHEREAS, Burns Construction, Inc., owns or has access to a large portable 385 KW electrical generator; and

WHEREAS, the parties agree that said portable electrical generator should be available on short notice for use by the Town of Cathlamet at its water treatment plant in the event of an emergency requiring portable electrical generating capability; **NOW, THEREFORE,**

IT IS HEREBY AGREED:

1. The portable electrical generator of Burns Construction, Inc. shall be available for use by the Town at its water treatment plant in the event of an emergency requiring electrical generating capability.

2. The Town agrees to compensate Burns Construction, Inc at the then current rental rates prevailing in the area for the use of said generator, or such other sums as may be agreed between the parties.

3. In recognition of the paramount importance of having this emergency generating capability available to the Town in the event of an emergency, Burns Construction, Inc. agrees to provide the Town of Cathlamet notice within 24 hours of determining said generator is unavailable due to mechanical breakdown or the removal of the generator from the County.

4. This Agreement may be revoked by either party with ten (10) days written Notice to the other party, otherwise to continue

WILLIAM J. FAUBION
DANIEL H. BIGELOW
ATTORNEYS AT LAW
CATHLAMET, WASHINGTON 98612
(360) 795-3387

indefinitely.

EXECUTED IN DUPLICATE this 2nd day of ~~August~~ September, 1999.

Barbara L West
BARBARA WEST, MAYOR

BURNS CONSTRUCTION, INC.

By: LeRoy A Burns

It's President

WILLIAM J. FAUBION
DANIEL H. BIGELOW
ATTORNEYS AT LAW
CATHLAMET, WASHINGTON 98612
(360) 795-3367

APPENDIX D

WATER SYSTEM STANDARDS

WATER SYSTEM STANDARDS

FOR THE

TOWN OF CATHLAMET, WASHINGTON

Revised — November 1994

Town of Cathlamet, Washington

Water System Standards

TABLE OF CONTENTS

TOWN OF CATHLAMET, WASHINGTON
WATER SYSTEM STANDARDS

SECTION I - INTRODUCTION

1.01 Purpose

These standards shall apply to all improvements to the municipal water system owned and maintained by the Town of Cathlamet. They are to be used as minimum standards for the design and construction of the water distribution system improvements. No change in these standards shall be made without prior approval of the Town Council and the Washington State Department of Health.

1.02 Plan Approval

For repair of existing water lines or installation of new water lines which comply with the Water System Plan adopted by the Town Council and approved by the Department of Health, a plan containing the following information shall be prepared:

a) Vicinity Map
b) North Arrow
c) Property lines and right of way lines
d) Pipe location and size
e) Location of all other existing and proposed installations including roads, sidewalks, lots, sewer lines, underground telephone, electric power and TV cable
f) Location and size of all service connections, valves, hydrants and blow off installations
g) Profile of ground and depth of pipe
h) Notes indicating pipe material and class, and that construction will be in conformity with the Standard Specifications

This plan shall be submitted to the Town Council for review and approval. Appropriate plan review fees may be charged for additional review by the Town's Engineer. No construction may begin until authorization to proceed is received from the Town Council.

For more complex additions, extensions, changes, or alterations to the municipal water system, complete plans and specifications shall be prepared by a professional engineer licensed in the State of Washington. These plans and specifications, along with engineering reports, where required, shall be submitted for approval to the Town Council and the Department of Health.

1.03 **Construction Report**

A construction report shall be submitted to the Town Council and the Department of Health within 60 days of completion and prior to use of the installation. The report shall state that the project was constructed in accordance with approved plans and specifications, and that testing and disinfection were carried out in accordance with the specifications. This report shall be certified by a licensed professional engineer, where required.

1.04 **Easements**

All water mains constructed within public right of way or dedicated easements shall become the property of the Town of Cathlamet upon completion and acceptance. Easements for waterlines shall be prepared and dedicated to the Town where waterlines are constructed in private property. These easements shall be at least fifteen feet wide, and shall be perpetual and exclusive to the Town of Cathlamet. The easement language shall be approved by the Town Attorney.

SECTION II – DESIGN

2.01 **Size**

Water main sizes shall be as recommended in the Cathlamet Water System Plan. For areas not covered in the Plan, sizes shall be determined based on proposed water demand and pressure parameters. Sizing shall be based on Sizing Guidelines for Public Water Supplies, prepared by the Department of Health. In addition, water mains shall be a minimum of eight (8) inches in diameter, except that four (4) inch pipe may be used where no future extension is possible, where the length does not exceed three hundred feet and no more than eight single family customers are to be served by the line.

The minimum line size required may be increased by the Town Council to accommodate fire flows.

2.02 **Minimum Cover**

All pipelines shall be designed to have a minimum of three feet (3'-0") of cover.

2.03 **Looped System**

All water mains shall be looped where possible. The Town Council may require that additional pipe be installed to complete loops. Mains that are not looped shall be provided with a two (2) inch blow off.

2.04 **Valves**

Valves shall be provided that are the same size as the pipeline installed. Two valves shall be provided at three-way (tee) intersections and three valves shall be provided at four-way (cross) intersections. Valves shall be located immediately adjacent to the pipeline intersection. Additional valves may be required in long runs of pipeline, as determined by the Town Council.

2.05 **Fire Hydrants**

Fire hydrant spacing shall be determined by the fire district, but shall not exceed 900 feet. If phased installation of water facilities are approved by the Town Council, fire hydrants do not need to be installed until source, storage, and transmission capacity needed to meet fire flows are operational. However, in such instances, tees shall be installed in the water line where fire hydrants will be located.

Fire hydrants shall be located so as not to be obstructed by any structure or vegetation, or have visibility impaired for a distance of fifty feet in the direction of vehicular approach to the hydrant. Fire hydrants subject to vehicle damage, such as those located in parking lots, shall be adequately protected.

2.06 **Service Connections**

All services shall be individually metered. For single family dwellings each service shall have a corporation stop, meter stop, tailpiece, meter, and meter box (see service connection detail). Minimum service line size for single family houses shall be 3/4" for one house and 1 1/4" for two houses. Service line size for other uses and meter size shall be sized according to AWWA Manual M22, Sizing Water Service Lines and Meters. The meter shall normally be located adjacent to the property being served.

2.07 **Thrust Blocking**

All pipelines four (4) inches in diameter or larger shall be securely anchored by suitable thrust blocking of all tees, plugs, caps, bends and other locations where unbalanced forces exist. Approved pipe joint restraint devices may be used in lieu of thrust blocking. Such devices shall be designed to provide restraint equal to that determined for thrust blocks.

2.08 **Air Release/Vacuum Valves and Blow Offs**

Combination air release/vacuum valves shall be installed at all high points or summits in long mains, where no services exist. Blow off assemblies shall be installed at the end of mains which are not looped and at low points in the main where fire hydrants are not available for flushing.

SECTION III - MATERIALS

Note: All references to AWWA or ASTM Specification shall mean the most recent revision thereof.

3.01 Main Pipe

All pipe furnished shall be new and of domestic manufacture. In all areas subject to traffic loading, the pipe material shall be ductile iron, conforming to AWWA Specification C151. Unless a higher classification is required by detailed specifications, thickness Class 52 shall be used for pipe sizes eight (8) inches and smaller. Pipe ten (10) inches and larger shall be Class 51. All pipe shall have push-on mechanical joints, and shall be cement lined in accordance with AWWA Specification C104.

In areas not exposed to traffic loading, PVC pipe conforming to AWWA Specification C900 may be furnished in lieu of ductile iron pipe. Unless a higher pressure classification is required by detailed specifications, Class 150 shall be furnished.

3.02 Fittings

Fittings for four (4) inch and larger ductile iron or PVC water pipe shall be gray iron or ductile iron conforming to AWWA Specifications C110 and C111 or compact ductile per AWWA C153. Fittings shall be cement lined in accordance with AWWA Specification C104.

Fittings shall be mechanical joint, except where the fitting type is specifically stated in detailed specifications and/or on the plans. All reducers six (6) inches and larger shall be restrained with tie rods.

3.03 Valves

Valves ten (10) inches and smaller shall be gate valves. Valves twelve (12) inches and larger shall be butterfly valves. Gate valves shall be iron body, double disc, o-ring seal, non-rising stem type, bronze mounted resilient seated conforming to AWWA Specification C509.

Butterfly valves shall be rubber seated, tight closing type conforming to AWWA Specification C504. All valves shall open counter clockwise and shall be designed for 200 psi working pressure and 400 psi test pressure, unless a higher pressure rating is specifically stated in detailed specifications.

3.04 Valve Box

Valve Boxes shall be furnished with all valves, and shall be cast iron, sliding type, adjustable to conform to trench depths varying from three (3) to six (6) feet. Covers shall be heavy, well fitting and designed to withstand heavy traffic load without damage. They shall be embossed with the word "Water".

3.05 Fire Hydrants

Fire hydrants shall be compression type, dry-barrel, conforming to AWWA Specification C502. Hydrants shall have a nominal 5 1/4 inch main valve opening with six (6) inch bottom connection, and equipped with two 2 1/2 inch hose nozzles and one 4 1/2 inch pumper nozzle. Operating nut shall be 1 1/2 inch national standard pentagon, counter-clockwise opening. The main valve shall be equipped with o-ring seals, and shall remain closed if barrel is accidentally broken off. Nozzle threads shall be American National Standard.

Length of hydrant barrel shall be sufficient for 36" pipe cover and to position the base flange six (6) inches above adjacent ground.

3.06 Service Connections

Corporation stops for direct tap or use with service saddles shall be manufactured from certified 85-5-5-5 waterworks brass and shall conform to AWWA Standard C800, with the AWWA Standard thread inlet (commonly called "Mueller" thread), and copper flare fitting outlet.

Where required, service saddles shall be solid brass, double strap type, cast from certified 85-5-5-5 waterworks brass. Straps shall be high quality silicon bronze flattened to provide a wide bearing surface against the pipe. Threads shall be AWWA standard, as above.

Service lateral piping shall be seamless copper tubing conforming to ASTM Specification B-88, Type K or 200 psi polyethylene. Polyethylene pipe must be installed with a tracer wire.

Angle meter stops shall be manufactured from certified 85-5-5-5 waterworks brass and shall conform to AWWA Standard C800, with copper flare fitting inlet, standard meter thread outlet, and lock wings.

Meter box for single residential service shall be a Carson Plastic Meter Box or approved equal, size as required by the Town of Cathlamet.

Meter boxes for multi-family, commercial and industrial developments shall be of sufficient size to house the main meter, low flow meter, bypass (if required), and back flow prevention device (if required). Two feet of clearance shall be provided on all sides of the meter and other required devices.

3.07 Air Release/Vacuum Valves

Combination air release/vacuum valves shall be iron body, bronze mounted, with maximum operating pressure of 300 psi. The valves shall have a large office equal to 2" and shall be APCO Model 145C or approved equal.

SECTION IV - CONSTRUCTION

4.01 Excavation and Preparation of Trench

Excavation for the installation of water mains and service lines shall be carried to a depth required to provide uniform and continuous bearing and support for the pipe on solid and undisturbed ground with a minimum cover of 36 inches over the top of the pipe, unless otherwise authorized. Excavation shall be carried four (4) inches below pipe inverts to allow for placement of a four (4) inch bedding layer of 3/4"-0" crushed rock or other approved bedding material.

After placement of bedding, the bottom of the trench shall be graded by hand to the line and grade to which the pipe is to be laid. At the location of each joint, bell holes shall be dug to permit the joint to be made properly and to permit visual inspection of the entire joint.

Ample means and devices shall be provided and maintained at all times to remove and dispose of all water entering the trench during pipe installation.

4.02 Laying Pipe

All pipe, fittings and appurtenances shall be lowered into the trench by means of a crane, ropes or other suitable tools or equipment, in such a manner as to prevent damage to the materials and protective coatings and linings. Dirt or other foreign material shall be prevented from entering the pipe or appurtenances during handling and laying operations. When pipe laying is not in progress, the open end of the pipe shall be closed by a watertight plug to ensure cleanliness inside the pipe.

After the first length of pipe has been installed in the trench, it shall be secured in place with approved backfill material tamped under and along the sides to prevent movement.

Preparation of the bell, spigot and gasket and jointing of the pipe shall be done is strict conformance with the pipe manufacturer's instructions.

4.03 Cutting Pipe

Pipe cuts for inserting valves, fittings or closure pieces shall be made in a neat and workmanlike manner without damaging pipe or lining and so as to leave a smooth end at right angles to the axis of the pipe. Cutting shall be done with a milling type cutter or saw. Ends of cuts shall be dressed by bevelling, as recommended by the manufacturer.

4.04 **Laying of Pipe on Curves**

Where it is necessary to deflect pipe from a straight line either in a vertical or horizontal plane, the amount of deflection in rigid pipe joints or the amount of bending of flexible pipes shall not exceed the maximum amounts recommended by the pipe manufacturer.

4.05 **Backfilling**

Immediately after the pipe is laid, it shall be backfilled to the spring line bedding material. The material shall be carefully rammed and tamped under the haunches of the pipe to provide firm and uniform support over the full length of all pipe, valves and fittings. Additional bedding material shall be placed and hand tamped to a point 12" above the top of the pipe.

In unimproved areas, including paved surfaces and gravel shoulders, the trench shall be filled with approved granular backfill material, placed in layers not exceeding six (6) inches in thickness and mechanically compacted. Base rock, pavement and shoulder rock shall be replaced to the thickness removed or the minimums show on Standard Drawing No. 1.

All surplus excavated material unsuitable for use as backfill shall be removed from the project site and disposed of.

4.06 **Installation of Fittings**

Fittings shall be installed following the manufacturer's recommendations. Dropping of fittings into trench is prohibited. Before lowering fittings and while they are suspended, each fitting shall be inspected and lightly tapped with a hammer to detect flaws. All defective fittings shall be rejected and removed from the site.

4.07 **Installation of Valves**

All valves shall be inspected to insure proper working order before installation. The valves shall be set and jointed to the pipe in conformance with AWWA Standards and the manufacturer's recommendations. Valves and valve boxes shall be set plumb and valve boxes shall be placed over the valve in such a manner that the valve in such a manner that the valve box does not transmit shock or stress to the valve.

The cast iron valve box cover shall be set flush with the finished ground surface. See Standard Drawing No. 2.

4.08 **Installation of Fire Hydrants**

Hydrants shall be set as shown on Standard Drawing No. 3. Installation shall be in accordance with manufacturer's recommendations.

4.09 **Installation of Service Connections**

Service connections shall be installed as shown on Standard Drawing No. 4. Direct taps shall be made to all sizes of ductile iron mains for 3/4 inch to 1 1/4 inch services. All other service connections shall be made using service saddles.

4.10 **Installation of Thrust Blocking**

All blocking shall be of 2,500 psi concrete. Concrete shall be poured as stiff as possible and shall be covered after pouring. Blocking shall be placed between undisturbed earth and the fitting to be anchored in a manner that the pipe and fitting joints will be accessible for repair. The block sizes and configuration for various fittings shall conform to Standard Drawing No. 5.

4.11 **Installation of Air Release/Vacuum Valves and Blowoffs**

Air Release/Vacuum Valves and Blowoffs shall be installed where shown on the plans, or where required by the Town based on design conditions. The installations shall conform to Standard Drawing No. 6 for air release/vacuum valve assemblies, and Standard Drawing No. 7 for blow off assemblies.

4.12 **Flushing of Completed Lines**

The mains shall be thoroughly flushed following installation. It must be understood that flushing removes only the lighter solids and cannot be relied upon to remove heavy materials. Heavy materials must not be allowed to enter the pipe at any time (see paragraph 4.02).

Where a hydrant is not installed at the end of main, a tap must be provided that is large enough to develop a scouring velocity in the main of at least 2.5 feet per second. Where facilities are available, a scouring velocity of 4.0 feet per second is recommended. The water department will furnish the water for flushing at a time of day when sufficient quantities of water are available for normal system operation.

SECTION V - TESTING AND DISINFECTION

5.01 Hydrostatic Testing

Pressure and leakage tests shall be made on all newly installed pipe, fittings, valves, hydrants, and other appurtenances in sections of convenient length under a hydrostatic pressure equal to 200 psi. Sections to be tested shall normally be limited to 1,500 feet. All pumps, gauges, plugs, saddles, corporation stops, miscellaneous hose piping, and measuring equipment for performing the test shall be furnished by the Contractor.

The pipeline shall be backfilled sufficiently to prevent movement of the pipe under pressure. All thrust blocks shall be in place and time allowed for the concrete to cure before testing. Where permanent blocking is not required, temporary blocking shall be installed as needed and removed after testing.

The mains shall be filled with water and allowed to stand under pressure a sufficient length of time to allow the escape of air and allow the lining of the pipe to absorb water. The water department will furnish the water for testing at a time of day when sufficient quantities of water are available for normal system operation.

The test shall be accomplished by pumping the main up to the required pressure; stopping the pump for 15 minutes; then pumping the main up to the test pressure again. During the test, the section being tested shall be observed to detect any visible leakage. A clear container shall be used for holding water for pumping up pressure on the main being tested.

The quantity of water required to restore the pressure shall be accurately determined by pumping through an approved water meter of from a calibrated container.

Acceptability of the test will be determined by two factors, as follows:

1) The quantity of water lost from the main shall not exceed the number of gallons per hour as determined by the following formula:

$$L = \frac{ND\,(P)^{0.5}}{7,400}$$

where L = Allowable leakage, gallons per hour
N = Number of joints in the length of pipeline tested
D = Nominal diameter of the pipe in inches
P = Test pressure during leakage test, psig

2) There shall not be an appreciable or abrupt loss in pressure during the 15 minute test period.

Any leakage detected during the test shall be corrected regardless of the allowable leakage specified above. Should the tested section fail to meet the pressure test successfully as specified, the defects shall be located and repaired until the leakage of a subsequent test is within the specified allowance.

All tests shall be made with the hydrant auxiliary gate valves open and pressure against the hydrant valve. After the test has been completed, each gate valve shall be tested by closing each in turn and relieving the pressure beyond. This test of the gate valve will be acceptable if there is no immediate loss of pressure on the gauge when the pressure comes against the valve being checked. The pressure differential across the valve shall not exceed the rated working pressure of the valve.

5.02 **<u>Disinfection of Water Mains</u>**

Before being placed into service, all new mains, repaired portions or extensions must be chlorinated so that a chlorine residual of at least twenty five (25) parts per million remains in the water after 24 hours standing in the pipe. The residual may ordinarily be expected with an initial application of 50 parts per million, although some conditions may require more. Ineffective preliminary flushing of the main may require a large application of chlorine to produce the desired residual.

Methods of applying chlorine to a main are listed below in order of preference:

A. Liquid chlorine gas - water mixture

B. Direct chlorine feed (dry gas)

C. Calcium of sodium hypochlorite and water mixture

D. Chlorinated lime and water mixture

NOTE: The practice of adding a small amount of chlorine powder or tablets at each joint as the main is being laid is not an acceptable method of chlorinating a pipeline. The procedure does not permit preliminary flushing nor does it provide uniform chlorine distribution.

A chlorine gas-water mixture shall be applied by means of solution feed chlorinating device or dry gas may be fed directly through proper devices for regulating the rate of flow and providing effective diffusion of the gas into the water within the pipe being treated. Chlorinating devices for feeding solutions of chlorine gas or the gas itself must provide itself must provide means for preventing the backflow of water into the chlorine cylinder. Feeding of dry gas is limited to main pressures of less than ten (10) psi.

A mixture of water and chlorine-bearing compound of known chlorine content may be used. Acceptable compounds are calcium or sodium hypochlorite and chlorinated lime. These compounds should be mixed with water to yield of 1% chlorine solution according to Table 2.

TABLE 2

Product	Amount of Compound	Quantity of Water gal
High Test Calcium Hypochlorite (65-70% Cl)	1 lb.	7.50
Chlorinated lime (32-35% Cl)	2 lb.	7.50
Liquid Laundry Bleach (5.24% Cl)	1 gal.	4.25
Concentrated Liquid Bleach (15% Cl)	1 gal.	14.00

NOTE: Calcium Hypochlorite or bleaching powder should be made into a paste and then thinned to a 1% chlorine solution.

TABLE 3

Chlorine Requirements for 100 foot lengths of Various Sizes of Pipe

Pipe Size In.	Volume of 100 foot Length Gal.	100% Chlorine Lb.	1% Chlorine Water Solution - gal.
4	65.3	0.027	0.33
6	146.5	0.061	0.73
8	261.0	0.108	1.30
10	408.0	0.170	2.04
12	588.7	0.240	2.88

The preferable point of application of the chlorinating agent is at the beginning of the pipeline or any valved section and through a corporation stop in the top of the pipe. The water injector for delivery of the gas-water mixture into the pipe should be supplied from a tap on the pressure side of the gate valve controlling the flow into the pipeline extension. Chlorine bearing compounds should be pumped or ejected into the pipe as a 1% solution under the same conditions as above.

Valves shall be manipulated so that the strong chlorine solution in the new pipe will not flow back into the supply line. Check valves may be used if desired.

Water from the existing distribution system shall be controlled so as to flow slowly into the main to be chlorinated. The feed rate of the chlorine mixture shall be in such proportion to the rate of flow of water entering the pipe that at least twenty five (25) ppm residual may be obtained after 24 hours. (The initial application shall be at least 50 ppm).

Treated water shall be retained in the pipe line long enough to destroy all non-spore forming bacteria. This period should be at least 24 hours and chlorine residual of at least twenty five (25) ppm throughout the line shall be obtained at the end of the retention period.

Note that shorter retention periods with increased chlorine concentrations may be used under certain circumstances. Prior approval must be obtained from the State Board of Health when shorter retention periods are necessary.

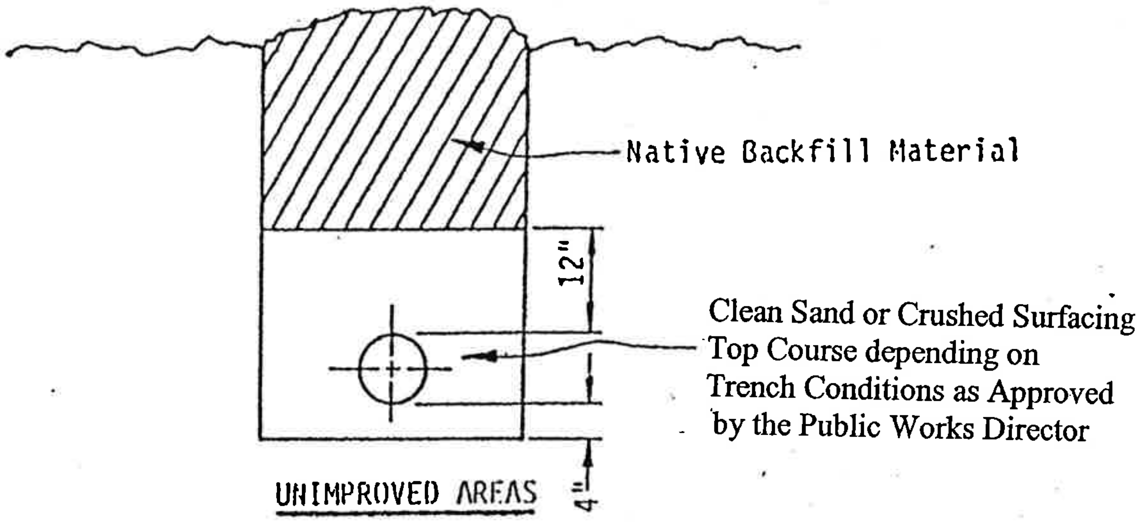
In the process of chlorinating pipelines, all valves shall be operated while the pipeline is filled with chlorinating agent.

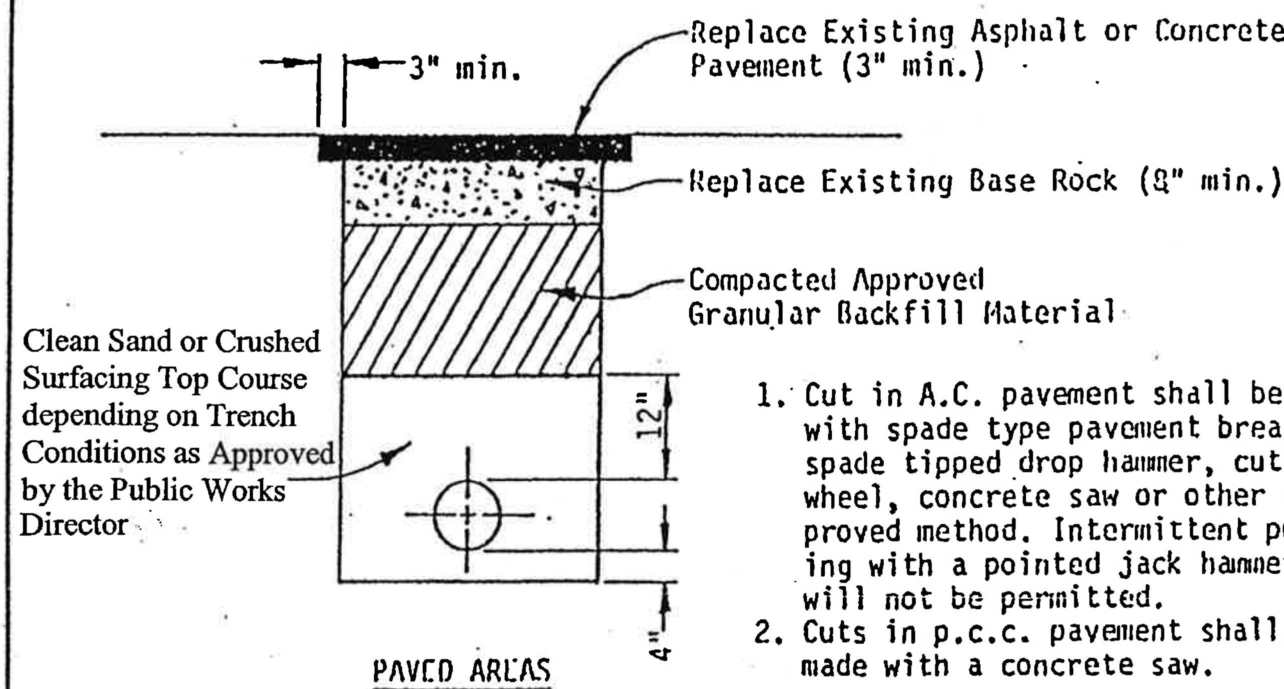
Following a retention period of 24 hours, all treated water in the main shall be thoroughly flushed from the newly laid pipeline at its extremities until the replacement water is of the same quality normally served from the distribution system. The satisfactory quality of water delivered from the new main must be verified by bacteriological samples collected from sterilized hoses or fire hydrants.

Should the initial treatment fail to yield satisfactory bacteriological results, the original chlorination and flushing procedure must be repeated and additional samples collected.

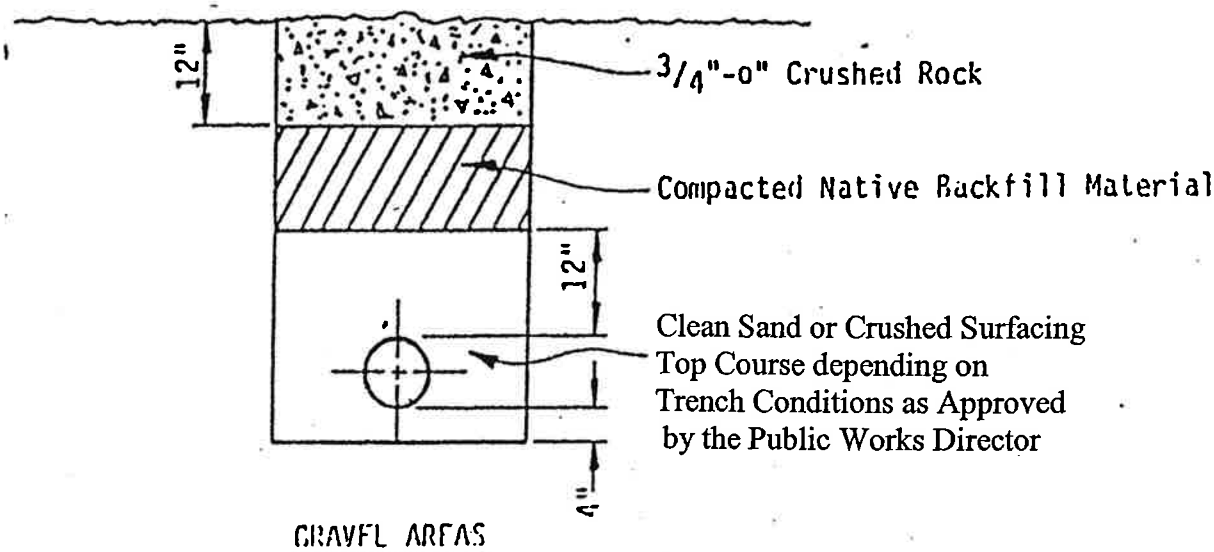
Whenever an existing line is opened by accident or design, the excavation is always wet and frequently badly contaminated. Where the main has been partially or totally dewatered, that section of main must be chlorinated and flushed the same as a new main. In the event that water service cannot be disrupted to provide the full 24 hour retention period, an application of 500 ppm of chlorine may be used with a retention period of thirty minutes followed by flushing.

Disinfection for service connections shall be accomplished by prechlorinating service pipe and appurtenances prior to installation, and flushing after installation prior to connecting the meter.

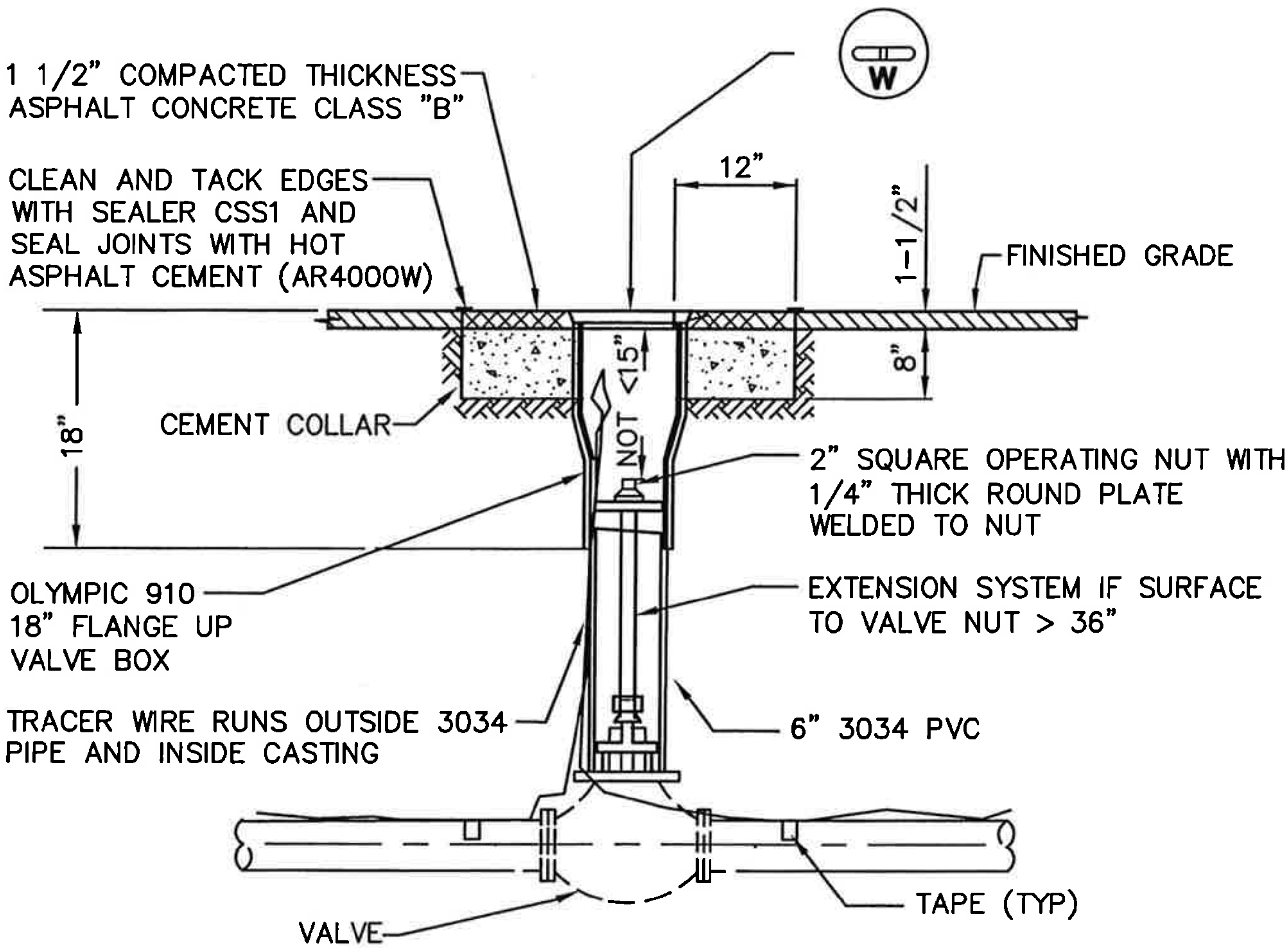




1. Cut in A.C. pavement shall be made with spade type pavement breaker, spade tipped drop hammer, cutting wheel, concrete saw or other approved method. Intermittent punching with a pointed jack hammer bit will not be permitted.
2. Cuts in p.c.c. pavement shall be made with a concrete saw.



TOWN OF CATHLAMET, WASHINGTON WATER SYSTEM STANDARDS OCTOBER, 1994	STANDARD DRAWING NO. 1 TRENCH DETAIL



VALVE BOX W/WIRE

NOT TO SCALE

TOWN OF CATHLAMET
STANDARD DRAWING NO. 2
WATER SYSTEMS STANDARDS
VALVE BOX W/WIRE

Gray & Osborne, Inc.
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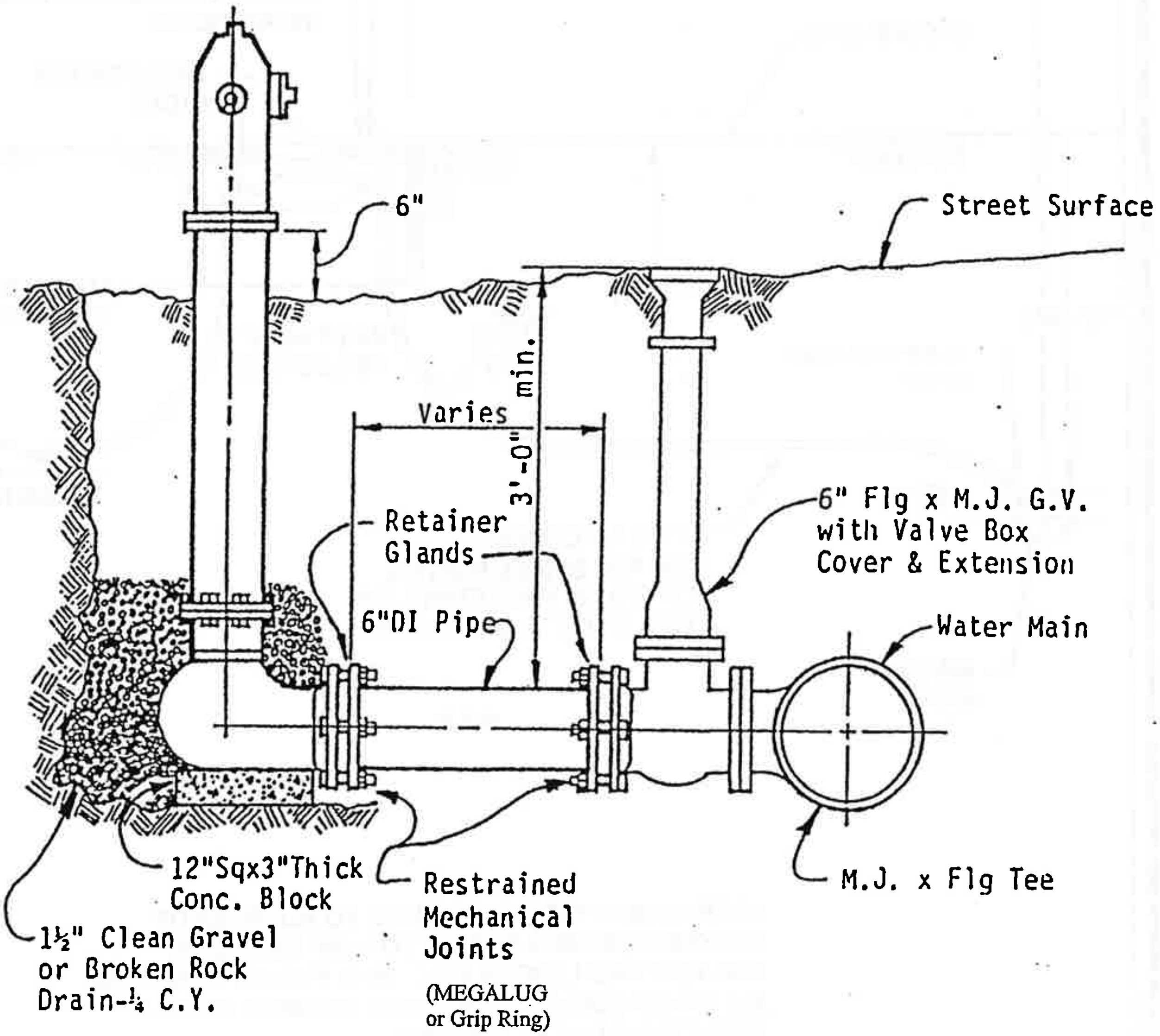
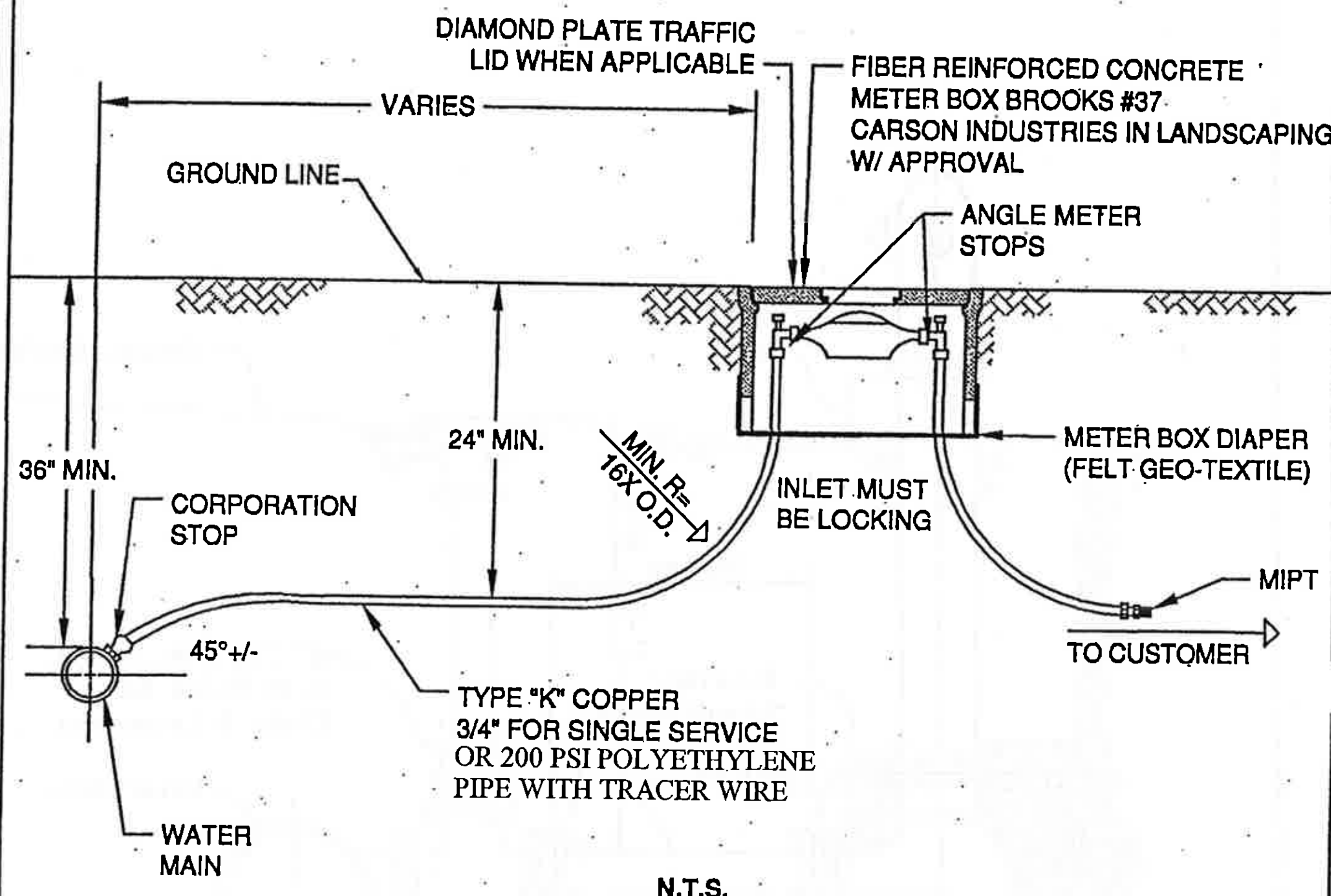


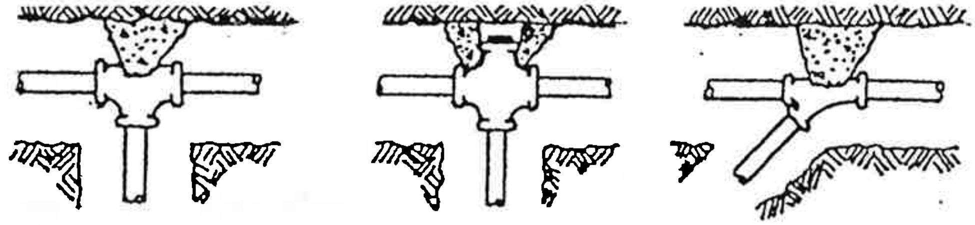
TOWN OF CATHLAMET, WASHINGTON
WATER SYSTEM STANDARDS
OCTOBER, 1994

STANDARD DRAWING NO. 3
FIRE HYDRANT DETAIL

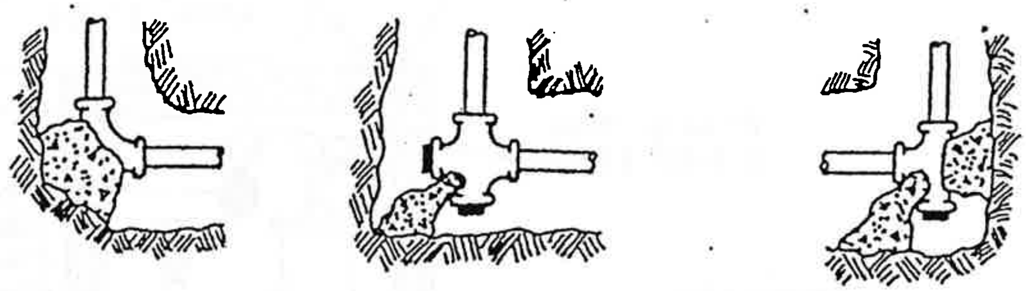


NOTE: DIRECT TAP MAY BE MADE TO ALL SIZES OF DUCTILE IRON MAIN FOR 3/4" TO 1-1/4" SERVICES, AND TO 6" AND LARGER P.V.C. MAIN FOR 3/4" SERVICES. ALL OTHER CONNECTIONS SHALL BE MADE USING A SERVICE SADDLE AT THE MAIN.

Town of Cathlamet, Washington **Water System Standards** **March 2000**	**Standard Drawing No.4** **Service Connection Detail**



TEE PLUGGED CROSS WYE



BEND PLUGGED CROSS TEE PLUGGED ON RUN

NOTES:

1. Concrete thrust blocking to be poured against undisturbed earth.
2. Keep concrete clear of joint and accessories.
3. The required thrust bearing areas for special connections are shown encircled on the plans:eg. 15 indicates 15 sq. ft. bearing area req'd.
4. If not shown on plans required bearing areas at fitting shall be as indicated below, adjusted if necessary, to conform to the test pressure(s) and allowable soil bearing stress(es) stated in the special specifications.
5. Bearing areas and special blocking details shown on plans take precedence over bearing areas and blocking details shown on this standard detail.

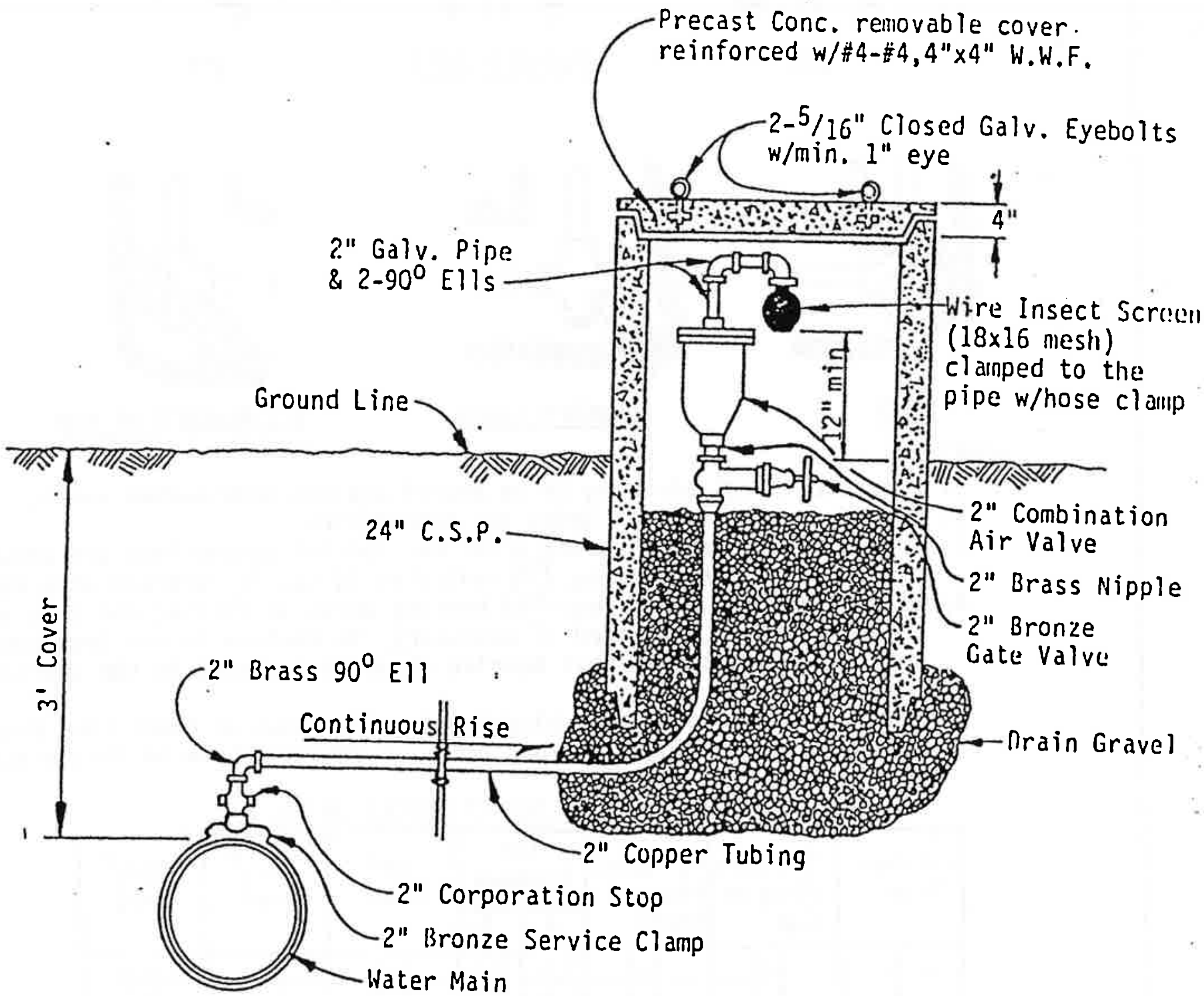
BEARING AREA OF THRUST BLOCKS IN SQ. FT.

Fitting Size	Tee, Wye Plug or Cap	90^{o} Bend Plugged Cross	Tee Plugged on run		45^{o} Bend	$22\text{-}\frac{1}{2}^{o}$ Bend	$11\text{-}\frac{1}{4}^{o}$ Bend
			A1	A2			
4	1.8	2.6	3.6	2.5	1.4	0.7	0.4
6	3.7	5.3	7.4	5.2	2.9	1.5	0.7
8	6.4	9.1	12.8	9.1	4.9	2.5	1.3
10	9.7	13.7	19.4	13.7	7.4	3.8	1.9
12	13.7	19.4	27.4	19.4	10.5	5.3	2.7
14	18.4	26.0	36.8	26.0	14.1	7.2	3.6
16	23.8	33.6	47.6	33.7	18.2	9.3	4.7
18	29.9	42.2	59.8	42.3	22.9	11.7	5.9
20	36.6	51.8	73.2	51.8	28.0	14.3	7.2
24	52.3	73.9	104.6	74.0	40.0	20.4	10.2

NOTE: Above bearing areas based on test pressure of 200 p.s.i. and an allowable soil bearing stress of 2000 pounds per square foot. To compute bearing areas for different test pressures and soil bearing stresses, use the following equation: Bearing area=(Test Pressure/200)x(2000/Soil Bearing Stress)x (Table Value).

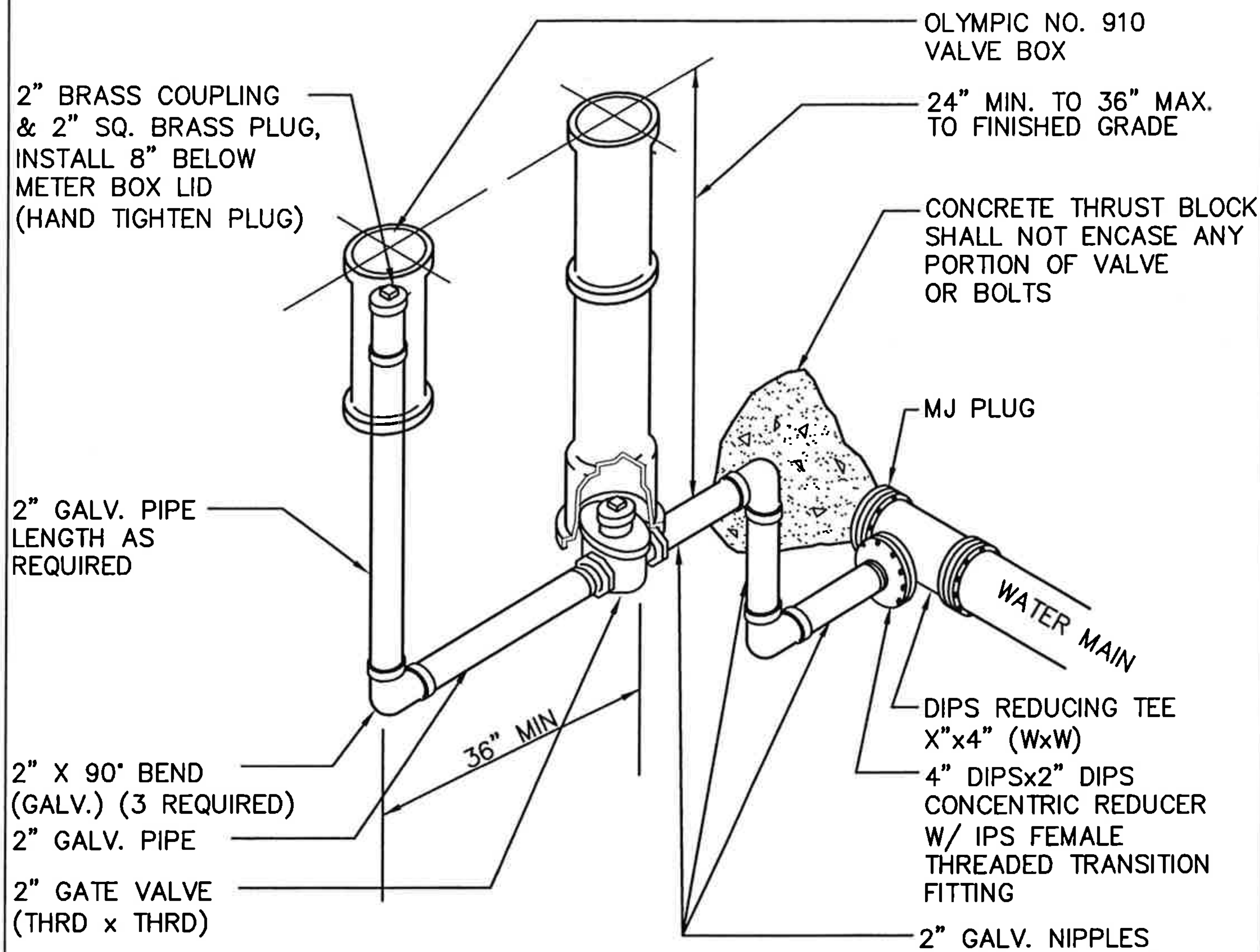
TOWN OF CATHLAMET, WASHINGTON
WATER SYSTEM STANDARDS
OCTOBER, 1994

STANDARD DRAWING NO.5
THRUST BLOCKING DETAIL



TOWN OF CATHLAMET, WASHINGTON
WATER SYSTEM STANDARDS
OCTOBER, 1994

STANDARD DRAWING NO. 6
AIR VALVE ASSEMBLY



NOTE:

1. A 4"x4" CONC. MARKER POST PAINTED YELLOW WITH THE DISTANCE AND DIRECTION TO THE VALVE STENCILED IN BLACK ON THE FACE OF THE POST SHALL BE INSTALLED WITH THE BLOWOFF ASSEMBLY.

2. ONE BLOWOFF PIPE ASSEMBLY (SEE DETAIL) SHALL BE PROVIDED FOR EVERY 4 BLOWOFF ASSEMBLIES INSTALLED.

END LINE BLOW OFF ASSEMBLY

NOT TO SCALE

TOWN OF CATHLAMET
STANDARD DRAWING NO. 7
WATER SYSTEMS STANDARDS
END LINE BLOW OFF ASSEMBLY

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APPENDIX E

CROSS-CONNECTION CONTROL

Chapter 13.50
CROSS CONNECTIONS

Sections:

13.50.010 Definitions.

Except where specifically designated herein, all words used in this chapter shall carry their customary meanings. Words used in the present tense include the future and plural words include the singular. The word "shall" is always mandatory, and the word "may" denotes a use of discretion in making a decision. Any definition not found in this section will take its meaning from Chapter 246-290 WAC, or as amended.

(1) "Air gap" means a physical separation between the free-flowing end of a potable water supply pipeline and the overflow rim of an open or nonpressure-receiving vessel. To be an "approved air gap," the separation must be at least twice the diameter of the inlet piping (supply pipe) measured vertically, and never be less than one inch.

(2) "Approved backflow prevention assembly" or "backflow assembly" or "assembly" means an assembly to counteract back pressures or prevent backsiphonage. This assembly must appear on the list of approved assemblies issued by the Washington State Department of Health.

(3) "Auxiliary supply" means any water source or system other than the town of Cathlamet water.

(4) "Backflow" means the flow of water or other liquids, gases or solids from any source back into the distribution system. The flow of water in the opposite direction of its intended flow.

(5) "Backflow assembly tester" means a person holding a valid BAT certificate issued in accordance with the WAC.

(6) "Backpressure" means a pressure caused by a pump, elevated tank or piping, boiler, or other means that is greater than the pressure provided by the public water system and which may cause backflow.

(7) "Backsiphonage" shall mean backflow due to a reduction in system pressure in the purveyor's distribution system and/or consumer's water system.

(8) "Building inspector" shall mean the building inspector for the town of Cathlamet.

(9) "Cathlamet" shall mean the town of Cathlamet.

(10) "Closed system" means any water system or portion of a water system in which water is transferred to a higher pressure zone closed to atmosphere.

(11) "Contamination" means the entry into or presence in a public water supply system of any substance which may be deleterious to health and/or quality of the water.

(12) "Cross connection" means any physical arrangement where a public water system is connected, directly or indirectly (actual or potential), with any other nondrinkable water system or auxiliary system, sewer, drain conduit, swimming pool, storage reservoir, plumbing fixture, swamp coolers, or any other device which contains, or may contain, contaminated water, sewage, or other liquid of unknown or unsafe quality which may be capable of imparting contamination to the public water system as a result of backflow. Bypass arrangements, jumper connections, removable sections, swivel or changeover devices, or other temporary or permanent devices through which, or because of which, backflow may occur are considered to be cross connections.

(13) "Cross connection specialist" or "CCS" shall mean a person holding a valid CCS certificate issued in accordance with the WAC.

(14) "Cross connection control manager" means a person or his/her designee appointed to manage the cross connection control program for the town.

(15) "Degree of hazard" means the low or high hazard classification that shall be attached to all actual or potential cross connections.

(16) "DOH" means Washington Department of Health.

(17) "Double check detector assembly" or "DCDA" means an assembly which consists of two independently operating check valves which are spring-loaded or weighted. The assembly comes complete with a shut-off valve on each side of the checks, as well as test cocks to test the checks for tightness. It shall also be provided with a factory bypass feature of a minimum of an approved double check assembly.

(18) "Double check valve backflow prevention assembly" or "double check assembly" or "double check" or "DCVA" or "DC" means an assembly which consists of two independently operating check valves which are spring-loaded or weighted. The assembly comes complete with a shut-off valve on each side of the checks, as well as test cocks to test the checks for tightness.

(19) "Health hazard" means an actual or potential threat of contamination of a physical, toxic or biological nature that would be a danger to health.

(20) "High hazard" means the classification assigned to an actual or potential cross connection that potentially could allow a substance that may cause illness or death to backflow into the potable water supply.

(21) "In-premises protection" means a method of protecting the health of consumers served by the customer's plumbing system (i.e., located within the property lines of the customer's premises) by the installation of an approved air gap or backflow prevention assembly at the point of hazard.

(22) "Inspector" or "surveyor" shall mean a person holding a valid CCS certificate issued in accordance with the WAC, who meets the stipulations in this title and the most recent edition of the town's SOP manual.

(23) "Local administrative authority" means the local official, board, department or agency authorized to administer and enforce the provisions of the Uniform Plumbing Code and all other plumbing codes recognized by the state of Washington.

(24) "Low hazard" means the classification assigned to an actual or potential cross connection that potentially could allow a substance that may be objectionable, but not hazardous to one's health, to backflow into the potable water supply.

(25) "Mobile unit" shall mean units connecting to the water system through a hydrant, hose bib, or other appurtenance of a permanent nature that is part of the town water system or a permanent water service to a premises. Examples can include but are not limited to the following: water trucks, pesticide applicator vehicles, chemical mixing units or tanks, waste or septage haulers, trucks or units, sewer cleaning equipment, carpet or steam cleaning equipment other than homeowner use, rock quarry or asphalt/concrete batch plants, or any other

mobile equipment or vessel. Uses that are excluded from this definition are recreational vehicles at assigned sites or parked in accordance with other town ordinances pertaining to recreational vehicles, and homeowner devices that are used by the property owner in accordance with other provisions of this, or other, town of Cathlamet ordinances pertaining to provision of water service to premises.

(26) "Person" means a natural person (individual), corporation, company, association, partnership, firm, limited liability company, joint venture company or association, and other such entity.

(27) "Plumbing hazard" means an internal or plumbing-type cross connection in a consumer's potable water system that may be either a pollutional or a contamination-type hazard. This includes, but is not limited to, cross connections to toilets, sinks, lavatories, wash trays, domestic washing machines and lawn sprinkling systems. Plumbing-type cross connections can be located in all types of structures including but not limited to homes, apartment houses, hotels and commercial or industrial establishments.

(28) "Point-of-use isolation" shall mean the same as "in-premises protection."

(29) "Pollutional hazard" means an actual or potential threat to the physical properties of the water system or the potability of the public or the consumer's potable water system but which would not constitute a health or system hazard, as defined. The maximum degree of intensity of pollution to which the potable water system could be degraded under this definition would cause a nuisance or be aesthetically objectionable or could cause minor damage to the system or its appurtenances.

(30) "Potable water supply" means any system of water supply intended or used for human consumption or other domestic use.

(31) "Premises" means any piece of property to which water is provided including, but not limited to, all improvements, mobile structures and structures located on it.

(32) "Premises isolation" means a method of protecting a public water system by installation of an approved air gap or approved backflow prevention assembly at the point of service (end of purveyor's service pipe) to separate the customer's plumbing system from the purveyor's distribution system.

(33) "Reduced pressure principle backflow prevention assembly" or "reduced pressure principle assembly" or "RP assembly" shall mean an assembly containing two independently acting approved check valves together with a hydraulically operated, mechanically independent pressure differential relief valve located between the check valves and at the same time below the first check valve. The assembly shall include properly located test cocks and tightly closing shut-off valves at each end of the assembly.

(34) "SOP" means the most recent edition of the town of Cathlamet's standard operating procedures manual.

(35) "Superintendent" means public works superintendent of the town of Cathlamet or his/her designee.

(36) "System hazard" means an actual or potential threat of severe danger to the physical properties of the public or consumer's potable water system or of a pollution or contamination which would have a detrimental effect on the quality of the potable water in the system.

(37) "Thermal expansion" means the pressure created in piping, when water is heated.

(38) "Town" or "the town" shall mean the town of Cathlamet, Washington.

(39) "UPC" means Uniform Plumbing Code.

(40) "Used water" means any water supplied by the town to a customer's property after it has passed through the service connection and is no longer under the control of the town.

(41) "WAC" means all regulations and amendments found in the most recent edition of the Washington Administrative Code which pertain to backflow and cross connections. (Ord. 550 § 2, 2012)

13.50.020 Purpose.

The purpose of this chapter is to protect the public water system from contamination or pollution due to any existing or potential cross connections as defined in WAC 246-290-010, or as amended, and this chapter. The purveyor shall ensure that cross connections between the distribution system and a customer's premises are eliminated or protected against by the installation of an approved air gap or approved backflow prevention assembly. (Ord. 550 § 2, 2012)

13.50.030 Cross connections regulated.

(1) No cross connections shall be created, installed, used or maintained within the territory served by the town, except in accordance with this chapter.

(2) The CCC manager for the town shall carry out or cause inspections to be carried out to determine if any actual or potential cross connection exists. If found necessary, an assembly commensurate with the degree of hazard will be required to be installed at the service connection.

(3) The owner, occupant or person in control of the property is responsible for all cross connection control within the premises.

(4) The use of any type of chemical spray attachment connected to the premises' plumbing, including but not limited to garden hose fertilizers and pesticide applicators, is prohibited except in accordance with this chapter.

(5) The use of any type of radiator flush kits or any other type of attachment connected to the premises' plumbing is prohibited except in accordance with this chapter. (Ord. 550 § 2, 2012)

13.50.040 Application and responsibilities.

This chapter applies throughout the town of Cathlamet and to every premises and property served by the town of Cathlamet water system. It applies to any premises, public or private, regardless of date of connection to the town water. Every owner, occupant and/or person in control of any concerned premises is responsible for compliance with the terms and provisions contained herein. (Ord. 550 § 2, 2012)

13.50.050 Backflow prevention assembly requirements.

A CCS employed by or under contract with the town shall determine the type of backflow assembly to be installed within the area served by the town. All assemblies shall be installed at the service connection unless it is determined by the CCS to install the assembly at the point of use. An assembly will be required in each of the following circumstances, but the CCS is in no way limited to the following circumstances:

(1) The nature and extent of any activity on the premises, or the materials used in connection with any activity on the premises, or materials stored on the premises, could contaminate or pollute the potable water supply.

(2) Premises having any one or more cross connections or potential cross connections as that term is defined in this chapter and the WAC.

(3) When an appropriate cross connection survey report form has not been filed with the CCC manager.

(4) Internal cross connections are present that are not correctable.

(5) Intricate plumbing arrangements or plumbing potentially subject to frequent changes are present that make it impractical to ascertain whether or not cross connections exist.

(6) There is a repeated history of cross connections being established or re-established.

(7) All lawn irrigation systems.

(8) There is unduly restricted entry so that inspections for cross connections cannot be made with sufficient frequency to assure that cross connections do not exist.

(9) Materials are being used such that, if backflow should occur, a health hazard could result.

(10) Installation of an approved backflow prevention assembly is deemed to be necessary to accomplish the purpose of these regulations in the judgment of the town.

(11) Any premises having an auxiliary water supply.

(12) When a building is constructed on commercial premises, and the end use of such building is not determined, or could change, a reduced pressure principle backflow prevention assembly will be installed at the service connection.

(13) There exists any used or reclaimed water return system.

(14) If it is determined that additions or rearrangements have been made to the plumbing system without obtaining proper permits as required by the code enforcement division, premises isolation will be required.

(15) All high health cross connection hazard premises which are defined in Table 9 of WAC 246-290-490, or as amended, are required to have premises isolation by installing an approved air gap or reduced pressure principle assembly in accordance with this chapter. (Ord. 550 § 2, 2012)

13.50.060 Irrigation systems.

The type of assembly to be installed on an irrigation system will be commensurate with the degree of hazard but in no case less than a DCVA. The location of the assembly will be determined by the town's CCS. (Ord. 550 § 2, 2012)

13.50.070 Fire systems.

(1) An approved double check detector backflow prevention assembly ("DCDA") shall be the minimum protection on all new fire sprinkler systems using piping material that is not approved for potable water use, and/or that does not provide for periodic flow-through during each 24-hour period. A reduced pressure principle detector backflow prevention assembly ("RPDA") must be installed, if any solution other than the potable water can be introduced into the sprinkler system. Retrofitting on fire sprinkler systems will be required in each of the following circumstances:

(a) Where improper maintenance has occurred;

(b) On all high hazard systems;

(c) Wherever an inspector deems necessary; and

(d) Wherever required by the WAC.

(2) All fire line systems which are on a designated lateral shall install the assembly on the lateral. The assembly must be installed in accordance with this chapter. (Ord. 550 § 2, 2012)

13.50.080 Wholesale customers.

Any customer that has a wholesale contract for water services with the town must have an active, ongoing cross connection program. The cross connection program must be in compliance with WAC requirements pertaining to public water systems. The town reserves the right at all times to require a reduced pressure principle assembly at the interconnect. Wholesale customers shall provide to the town a copy of their cross connection control annual summary report which was submitted to the DOH each year. (Ord. 550 § 2, 2012)

13.50.090 Mobile units.

(1) Any mobile unit or apparatus, as defined in CMC 13.50.010, which uses the water from any premises within the town's water system, shall first obtain a permit from the town and be inspected to assure appropriate backflow prevention is installed in accordance with the most recent edition of the SOP manual.

(2) The town reserves the right to revoke the business license of the owner of the apparatus or mobile unit if the owner fails to comply with above procedures. (Ord. 550 § 2, 2012)

13.50.100 Right-of-way encroachment.

(1) No person shall install or maintain a backflow prevention assembly upon or within any town right-of-way except as provided in this section.

(2) The town reserves the right to have an assembly installed in the right-of-way.

(3) A backflow prevention assembly required by the town may be installed upon or within any town right-of-way only if the owner proves to the town that there is no other feasible location for installing the assembly, and installing it in the right-of-way will not interfere with traffic or utilities. The town retains the right to approve the location, height, depth, enclosure, and other requisites of the assembly prior to its installation.

(4) All permits required by the town code to perform work in the right-of-way shall be obtained.

(5) The assembly shall be installed below or flush with the surrounding grade except when it is not practicable to install it in this manner. Any assembly or portion of an assembly which extends aboveground shall be located no closer than 18 inches to the face of the curb.

(6) A property owner shall, at the request of the town and at the owner’s expense, relocate a backflow prevention assembly which encroaches upon any town right-of-way, when such relocation is necessary for street or utility construction or repairs for purposes of public safety.

(7) A person commits an offense if he/she fails to relocate a backflow prevention assembly located in or upon any town right-of-way after receiving a written order from the town to do so. (Ord. 550 § 2, 2012)

13.50.110 Plumbing code.

As a condition of water service, customers shall install, maintain, and operate their piping and plumbing systems in accordance with the UPC and all Washington State plumbing laws. (Ord. 550 § 2, 2012)

13.50.120 Access to premises.

Authorized employees of the town, with proper identification, shall have access during the hours of 8:00 a.m. to 5:00 p.m. to all parts of a premises and within the building to which water is supplied. If any water user refuses access to a premises or to the interior of a structure during these hours for inspection by a cross connection specialist appointed by the town, a reduced pressure principle assembly shall be installed at the service connection to that premises. (Ord. 550 § 2, 2012)

13.50.130 Testing and repairs.

Backflow prevention assemblies shall be tested in accordance with the requirements set out in the WAC, or as amended, this title and the most recent edition of the town’s SOP manual. (Ord. 550 § 2, 2012)

13.50.140 Responsibilities of backflow prevention assembly testers.

All backflow assembly testers operating within the town shall be certified in accordance with all applicable regulations of the WAC and shall comply with all of the stipulations in this enforcement document and the most recent edition of the town's SOP manual. (Ord. 550 § 2, 2012)

13.50.150 Maintenance of assemblies.

Backflow prevention assemblies shall be maintained in accordance with the requirements set out in the WAC, or as amended, and the most recent edition of the town's SOP manual. (Ord. 550 § 2, 2012)

13.50.160 Installation requirements and specifications.

Backflow prevention assemblies shall be installed in accordance with the requirements set out in the WAC, or as amended, and the most recent edition of the town's SOP manual. (Ord. 550 § 2, 2012)

13.50.170 Thermal expansion.

If a closed system has been created by the installation of a backflow prevention assembly, it is the responsibility of the property owner to eliminate the possibility of thermal expansion. (Ord. 550 § 2, 2012)

13.50.180 Pressure loss.

Any reduction in water pressure caused by the installation of a backflow assembly is not the responsibility of the town. The town will give reasonable assistance to the owner regarding information on adequate sizing of assemblies and proper plumbing practices to provide for required pressure and flows for fire protection. (Ord. 550 § 2, 2012)

13.50.190 Parallel installation.

Premises where noninterruption of water supply is critical shall be provided with two assemblies of the same type installed in parallel. They shall be sized in such a manner that either assembly will provide the minimum water requirements while the two together will provide the maximum water requirements. (Ord. 550 § 2, 2012)

13.50.200 New construction.

(1) In all new construction, an approved backflow assembly shall be installed at the service connection. The type of the assembly will be commensurate with the degree of hazard as determined by an inspector.

(2) When a building is constructed on commercial premises, and the end use of the building is not determined or could change, a reduced pressure principle backflow prevention assembly shall be installed at the service connection to provide protection of the public water supply in the event of the most hazardous use of the building. (Ord. 550 § 2, 2012)

13.50.210 Residential service connections.

Any residential property which has been determined to have an actual or potential cross connection and/or has violated the plumbing code or this chapter in any way shall be required to install an approved backflow prevention assembly in accordance with this chapter. (Ord. 550 § 2, 2012)

13.50.220 Rental properties.

The property owner is responsible for the installation, testing and repair of all backflow assemblies on their property. When the tenants change, or if the plumbing is altered in any way, it is the responsibility of the owner to notify the town. (Ord. 550 § 2, 2012)

13.50.230 Retrofitting.

Retrofitting shall be required on all service connections where an actual or potential cross connection exists, and wherever else the town deems retrofitting necessary. (Ord. 550 § 2, 2012)

13.50.240 Costs of compliance.

All costs associated with purchase, installation, inspections, testing, replacement, maintenance, parts, and repairs of the backflow assembly are the financial responsibility of the property owner. (Ord. 550 § 2, 2012)

13.50.250 Termination of service.

Failure on the part of any property owner, their renter, agent or personal representative to discontinue the use of all cross connections or to physically separate cross connections in accordance with this chapter is sufficient cause for the immediate discontinuance of public water service to the premises. (Ord. 550 § 2, 2012)

13.50.260 Emergency suspension of service.

The superintendent or his/her designee may, without prior notice, suspend water service to any premises when such suspension is necessary to stop an actual or potential cross connection as defined in this chapter and the most recent edition of the town's SOP manual. (Ord. 550 § 2, 2012)

13.50.270 Nonemergency suspension of service.

The superintendent or his/her designee may suspend, with 24 hours' notice, the water supply to any premises where the conditions of this chapter or the most recent edition of the town's SOP manual have been violated. (Ord. 550 § 2, 2012)

13.50.280 Penalties.

Any person, firm, corporation or business entity violating this chapter, upon conviction thereof, is guilty of a misdemeanor, and shall be punished by a fine not to exceed $1,000, or by imprisonment in the county jail not to exceed 90 days, or both such fine and imprisonment. Each continuing day's violation under this chapter shall constitute a separate offense. The penal provisions imposed under this chapter shall not preclude Cathlamet from filing suit to enjoin the violation. The town of Cathlamet retains all legal rights and remedies available to it pursuant to local, state and federal law. (Ord. 649 § 2, 2021; Ord. 550 § 2, 2012)

The Cathlamet Municipal Code is current through Resolution 417, and legislation passed through March 21, 2022.

APPENDIX F

CHAPTER 13 MUNICIPAL CODE
AND WATER SERVICE APPLICATION

Title 13
PUBLIC UTILITIES

Chapters:

Chapter 13.05
DEFINITIONS

Sections:

13.05.010 Definitions.

The following words, when used in this title, shall have the following meanings unless defined differently in another chapter or section, in which case the definitions imposed in such other chapter or section will apply only to that chapter or section, unless the context clearly indicates otherwise:

(1) "Apartment house" means any building, or portion thereof, which is designed, built, rented, leased, let out, or hired out to be occupied as the home or residence of three or more families living independently and doing their respective cooking in the said building.

(2) "Commercial unit" means any building or facility used for any purpose other than dwelling, except industrial.

(3) "Control agency" means any governmental agency, entity, or jurisdiction empowered by law to license, regulate, or otherwise control the town's drinking water and wastewater systems, facilities, and operations, including but not limited to intake, distribution, storage, treatment, and discharge into receiving waters or other disposal methods.

(4) "Developed" means that condition of real property altered from its natural state by the addition to or construction of such property of impervious ground cover or other manmade physical improvements such that the hydrology of the property or portion thereof is affected.

(5) "Duplex" means a house which has accommodations for two families to live independently and do their cooking independently of each other.

(6) "Dwelling unit" means one room or a suite of two or more rooms, designed for or used by one family or housekeeping unit for living and sleeping purposes and having one kitchen. Each unit shall provide a complete independent living space for one or more persons, including permanent facilities for living, sleeping, eating, cooking and sanitation.

(7) "Equivalent dwelling unit (EDU)" means any residential or nonresidential use which has been found to place a demand on the town's sewerage system or water system approximately equal to the demand thereon by a single-family dwelling.

(8) "House connection" is defined as the pipe from the meter to the point of use.

(9) "Hotel" means any building containing three or more guest rooms intended or designed to be used, or which are used, rented or hired out to be occupied, or which are occupied, for sleeping purposes by guests.

(10) "Impervious groundcover" means those hard-surfaced areas either which prevent or retard the entry of water into the soil in the manner that such water entered the soil under natural conditions preexistent to development, or which cause water to run off the surface in greater quantities or at an increased rate of flow than that present under natural conditions preexistent to development, including without limitation such surfaces as rooftops, asphalt or concrete sidewalks, paving, driveways and parking lots, walkways, patio areas, storage areas, and gravel, oiled macadam or other surfaces which similarly affect the natural infiltration or runoff patterns existing prior to development.

(11) "Industrial user" means a nongovernmental user of the town water and/or wastewater systems identified in the Standards Industrial Classification Manual, 1972, United States Office of Management and Budget, as amended and supplemented, under the following divisions:

(a) Division A: Agriculture, Forestry, and Fishing;

(b) Division B: Mining;

(c) Division D: Manufacturing;

(d) Division E: Transportation, Communications, Electric, Gas, and Sanitary Services; and

(e) Division I: Services.

A user in these divisions may be excluded from the industrial user category if the public works superintendent determines that the user will discharge predominantly domestic wastes and wastes from sanitary conveniences.

(12) "Industrial waste" means any liquid, solid or gaseous material or combination thereof resulting from any process of industry, manufacturing, commercial, food processing, business, agriculture, trade or research, including, but not limited to, development, recovering or processing of natural resources and:

(a) Has a concentration of biochemical oxygen demand (BOD) and suspended solids (SS) in excess of 200 milligrams per liter per average work day; or

(b) Has a discharge containing cadmium, chromium, copper, lead, zinc, silver or similar toxic substances; or

(c) Is found by the town, State Department of Ecology or United States Environmental Protection Agency to have a significant impact on the wastewater treatment system; or

(d) Has a discharge flow of 10,000 gallons or more per average work day based on water use registered at the meter. Discharge flow from nonmetered sources, such as rain catchment, shall be calculated by a formula to be determined by the State Department of Ecology.

(13) "Multiple-family (multifamily) dwelling" means a building or portion thereof designed or used as a residence by two or more families and containing two or more dwelling units.

(14) "Plan" means a storm drainage utility plan created by ordinance of the town.

(15) "Public works superintendent" means the person responsible for managing the water and sewer programs and rules set forth in this title, in addition to other public streets, roads, buildings, facilities, grounds, and properties owned by the town of Cathlamet.

(16) "Service connection" is defined as the pipe, meter and water facilities from the town main or branch line to the outlet side of the meter.

(17) Shall and May. "Shall" is mandatory and "may" is permissive.

(18) "Single-family dwelling" means a building designed or used for residential purposes by not more than one family and containing one dwelling unit only, including mobile homes when not located in a mobile home park and including condominium units subject to fee simple ownership, and excluding multiple-family dwellings, apartments and motels.

(19) "Special user" means any customer connected to the sewer system whose discharges meet or exceed the volumes and chemical characteristics controlled by CMC 13.70.510, and who must apply for a special use permit from the public works superintendent.

(20) "Town" means the town of Cathlamet, Washington, a duly incorporated municipal corporation of the state of Washington, situated in Wahkiakum County. (Ord. 568, 2013; Ord. 550 § 2, 2012)

Chapter 13.10
GENERAL PROVISIONS

Sections:

13.10.010 Applicability.

The provisions of this chapter shall apply to all connections to the utilities of the town of Cathlamet as addressed in this title. (Ord. 550 § 2, 2012)

13.10.020 Utility connections – Applications.

(1) All persons, firms and prospective users desiring to purchase capacity from the town of Cathlamet water, sewer, and utility systems shall first make application therefor on forms to be furnished by the town.

(2) The applicant shall state the purposes for which the utility capacity may be required and shall agree, as a condition for the use of the utility, to conform to the rules and regulations provided in this title and to such other rules and regulations as the council may adopt from time to time.

(3) No service shall be rendered until a prospective customer has signed the prescribed application. (Ord. 550 § 2, 2012)

13.10.030 Utility connections – Linkage to specific building permit.

No new connection to any utility addressed by this title shall be issued unless it is:

(1) Specifically for and in conjunction with a building permit application in accordance with the Cathlamet development code; or

(2) Specifically for service to an existing structure necessitating service under any provision of this title; or

(3) Necessary to abate any specific health threat or to alleviate any general threat to the health, safety or general welfare of the community. (Ord. 550 § 2, 2012)

13.10.040 Utility connections – Expiration.

(1) Any connection to any utility governed by this title shall expire one year from the date of approval unless:

(a) It has been activated and is a currently maintained utility account with the town; or

(b) Was issued in conjunction with a building permit that is still active and valid under the provision of CMC Title 15.

(2) If an active utility account is not kept current under the town's utility billing practices for a period of one year, it shall be considered abandoned and any system capacity attributed to such a connection shall revert to the town.

(3) The provisions of subsection (2) of this section shall not apply to residences subject to foreclosure or probate proceedings. (Ord. 582 § 1, 2016; Ord. 550 § 2, 2012)

13.10.050 Connection to utilities.

(1) No buildings or structures in the town of Cathlamet shall be occupied or used for dwellings or residential purposes unless such buildings or structures are provided with adequate water and sanitation facilities. Any buildings or structures shall be deemed to have adequate water facilities if the same are connected with the Cathlamet water system, and shall be deemed to have adequate sanitation facilities if the same are connected to the town sewer system.

(2) It is unlawful for any person, firm, organization or corporation to operate or conduct any business, shop, store or establishment where members of the public, customers, shoppers or purchasers enter in or upon the premises, shop, place of business, or business establishment used in the conduct or operation of such business without having available upon and at the premises or place of business water, lavatory and adequate sanitary and sewage facilities as determined by the public works superintendent.

(3) The town's building official shall not issue certificates of occupancy until the public works superintendent has determined that this section has been complied with. (Ord. 550 § 2, 2012)

13.10.060 New construction – Water/sewer connection fees.

The town of Cathlamet hereby sets the following fees for water and sewer connections:

			Effective January 1, 2015	
	Water	**Sewer**	**Water**	**Sewer**
In Town:	$100.00 plus cost of labor and materials	$100.00 plus cost of labor and materials	$3,000 plus cost of labor and materials	$3,000 plus cost of labor and materials
Out of Town:	$100.00 plus cost of labor and materials	$100.00 plus cost of labor and materials*	$5,000 plus cost of labor and materials	$5,000 plus cost of labor and materials
Water Deposit:	$300.00, as specified in CMC 13.15.005			
New Connection:	$100.00, as specified in CMC 13.25.040 (turn-on fee)			
Existing Disconnect/ Reconnect:	$30.00, as referenced in CMC 13.15.030 (service charge)			
Building Sewer Permit:	$25.00, as specified in CMC 13.80.320			

* **NOTE:** Sewer connections made to the interlocal agreement between the town and Wahkiakum County governing the Boege Road sewer extension are subject to both a town connection fee of either $100.00 if prior to January 1, 2015, or $5,000 if on or after January 1, 2015, plus a $3,000 county system development fee, pursuant to CMC 13.75.020 and 13.75.030.

(Ord. 569, 2013)

13.10.065 Utility tax.

In addition to water and sewer charges imposed herein, the amount billed includes a six percent tax calculated on the gross revenue of the water utility and a six percent tax calculated on gross revenue of the sewer or wastewater utility. The town discloses the tax assessed under this section pursuant to the requirements of RCW 35.92.460. (Ord. 655 § 1, 2022; Ord. 550 § 2, 2012)

Chapter 13.15
UTILITY RATES AND BILLING PROCEDURE

Sections:

13.15.005 Deposits.

The town shall charge the following deposit fees for setting up each utility account when it is established and when changed from time to time: $100.00 for water *or* sewer only accounts and $200.00 for water *and* sewer accounts.

The council may adjust the deposit amount by ordinance as it deems necessary. The deposit fee will be refunded after one year of timely payment of utility bills in full to the town, with the refund automatically issued as an account credit; or, the deposit fee will be refunded upon account closure; provided, that the account is in good standing with no arrearages due the town, whichever occurs first.

(1) *Deposit Fee Waiver.* Residential customers may submit, by written request on a town form, to have the utility deposit fee waived; provided, the criteria stated below is fully met as determined by town staff.

(2) The mayor, or his designee, is empowered to approve a request made for a utility deposit fee waiver upon receipt of a written request to do so from a town utility customer. Upon receipt of such notice from the customer, the mayor, or his designee, shall review the customer's account to ensure a waiver is found to be appropriate and shall not directly place the town into an uncollectable situation.

(3) Town staff have the authority to deny any requests made if they determine the criteria as stipulated in this section is not fully met and may submit any denied requests made to council for further review upon written receipt from the utility customers.

(4) *Deposit Fee Waiver Criteria to Make Request.*

(a) Customer who is or will be relocating within/out of the town limits.

(b) Customer acting as responsible billing party, requesting account name change.

(c) Customer with multiple utility accounts, establishing an additional account.

(5) *Deposit Fee Waiver Criteria to Approve Request.* This section shall apply as the basic needed criteria overall and all subitems under subsection (4) of this section.

(a) Customer has an active utility account with the town for the most recent one-year period;

(b) The customer's account is in good standing with no more than one delinquency notice;

(c) Customer can provide proof of ownership due to death, divorce, or other form of long-term ownership resulting from immediate family;

(d) Customer can provide proof of payment history including but not limited to furnishing bank statements and/or utility receipts applicable to their account;

(e) Customer accounts are nontransferable outside of these specific stipulations and require a new utility account be established;

(f) This section shall not apply to landlord-tenant utility accounts and remain fully collectable for utility deposits.

(6) The town staff shall use their best judgement and investigate and review requests thoroughly prior to processing any utility deposit waivers. Staff shall submit for council approval any requests that may represent an actual conflict of interest, including those submitted by themselves, any staff, family members, or any other known persons that give rise to a conflict of interest.

(7) The town may require returning customers who left an outstanding balance on their accounts to pay their previous balance, plus penalties and interest pursuant to its policies, and to provide a double security deposit, as a condition for providing water or water-sewer service. Deposits for these accounts shall remain on the customer's account for the duration of their service and shall not be refundable until after termination of service has occurred. (Ord. 655 § 2, 2022; Ord. 625 § 1, 2020; Ord. 582 § 2, 2016; Ord. 550 § 2, 2012)

13.15.010 Establishing of rates – Review.

The town shall establish the rates to be charged for each utility. Town staff shall review the utility rates set on an annual basis and submit recommendations to the town council. Recommendations shall be reviewed and the rates may be amended by the town council on all utility rates to allow for inflation, cost changes, or any other lawful consideration if it deems advisable.

Unless specified otherwise by resolution or ordinance approved by the town council following such review, utility rates specified in CMC 13.95.010, 13.95.020, 13.95.030, and 13.95.040 shall be adjusted annually, as of the December usage period, to be reflected on the first billing statement in January, commencing with the December 2018 usage period. Utility rates automatically adjusted shall be adjusted by the same percentage as the annual percentage change published by the Bureau of Labor Statistics for September of the prior year for the Consumer Price Index (CPI-U, all items, West Region, index period 1982-84=100), or if discontinued, the then-published CPI closest thereto. (For example, an automatic adjustment to be implemented for 2019 would be based upon the annual West Region CPI-U, all items, for the 12 months ended September 2018.) (Ord. 601 § 5, 2017)

13.15.020 Rate information.

Rates, connection charges, and systems development charges shall be kept on file by the town clerk-treasurer at Town Hall and made available to the public upon request. (Ord. 550 § 2, 2012)

13.15.030 Billing.

(1) All utility bills for water and sewer service shall be rendered monthly and shall be called town utilities in this title.

(2) All utility bills are due and payable in full on the fifth day of the month approximately one month after the closing date reflected on the billing. (For example, whether the closing date is January 31st or February 3rd, charges are due March 5th.) If the fifth falls on a weekend or a legal holiday recognized by the town, charges are due and payable the following business day. If payment is not received in a timely manner, the unpaid bill shall become delinquent and a termination notice shall be given, informing the customer that termination of service shall occur no sooner than 10 days from the date of mailing of the notice of termination of service. Water service may be terminated when any portion of the utility bill is unpaid and delinquent. A late charge shall be levied against any customer who becomes delinquent, which shall be not less than $30.00 for water service only, $30.00 for sewer service only, and $30.00 for water and sewer service accounts. A delinquent balance may bear interest as allowed by state law in an amount set by the town council.

(3) A notice of hearing shall be included on the termination notice given to the customer, as required by CMC 13.15.090. In those cases where billing is sent to an occupant not a property owner, termination notice shall be sent to the property owner as well as the tenant. If a hearing is requested by the utility customer within five business days of mailing of the notice, the hearing shall be arranged in accordance with CMC 13.15.090. Service shall not be terminated until after the date of any hearing. A service charge pursuant to CMC 13.10.060 shall be levied for termination notices which must be paid, prior to reconnection.

(4) Utility services will not be made available to any person or property for which delinquent payments are owed until said payments are made or arrangements satisfactory to the town are documented in writing.

(5) Sewer charges will continue even if the water service has been terminated and are subject to a $30.00 late fee.

(6) Failure of customer to receive a billing mailed by the town does not prevent assessment of a late penalty. (Ord. 655 § 3, 2022; Ord. 598 § 1, 2017; Ord. 550 § 2, 2012)

13.15.035 Water Cumulative Reserve Fund 402 and Sewer Cumulative Reserve Fund 403.

The separate special fund maintained for each utility and formally designated as an "enterprise fund" for each of said utilities are hereby renamed Water Cumulative Reserve Fund 402 and Sewer Cumulative Reserve Fund 403. Such utilities consist of water, sewer, and drainage. (Ord. 550 § 2, 2012)

13.15.040 Responsibility for billing.

All utility bills, including water and sewer billings, shall be the responsibility of the property owner for purposes of liens which may be assessed by the town of Cathlamet as provided in this chapter. However, utility billings may be sent to the tenants or residents of commercial or residential property under the following conditions:

(1) A deposit has been made by the tenant (CMC 13.15.005), a current address of the owner of real property is maintained with the town of Cathlamet, which is the responsibility of the owner, and any changes in the residents or tenants of the property are made known to the town by the owner.

(2) Such billing, once sent to the tenant or agent, will become the responsibility of the tenant or agent as well as the property owner, and each can be held jointly and severally liable for such billing.

(3) The owner and tenant, or agent, shall sign an application form, giving their consents for the utility service to be billed as provided in this section, and giving the address of each. Such form shall contain notification of the right of hearing on termination of utilities and a copy of such form shall be provided to both the owner of the real property and the tenant or resident of the real property. (Ord. 550 § 2, 2012)

13.15.045 Application of payments.

Payments, when received, shall be applied by date in the following sequence: penalties, fees, sewer, and water. (Ord. 550 § 2, 2012)

13.15.050 Minimum monthly charge.

(1) Unless a utility is abandoned under CMC 13.10.040, the minimum monthly charges for all services will apply. A minimum monthly fee will be charged for each utility.

(2) The sewer user charge shall begin the day that the connection is made to the public sewer. Once the sewer user charge has commenced, no credit shall be given for vacancy. (Ord. 655 § 4, 2022; Ord. 550 § 2, 2012)

13.15.060 Multiple real property ownership.

In the case of multiple real property ownership, one person shall be designated by the property owners to receive the water and sewer bill. Such person may be an association or managing group. Owners and/or landlords will receive a copy of the tenant's billing. (Ord. 550 § 2, 2012)

13.15.070 Adjustment of utility bills.

(1) The mayor, or his designee, is empowered to resolve billing disputes up to $300.00 upon receipt of a written request to do so from a town utility customer. Upon receipt of such notice from the customer, the mayor, or his designee, shall review the bill with the customer to see if the amount is justly owed. The customer shall have the right to have a meeting to bring forth reasons and evidence why such bill should not be due and owing. All disputes not resolved by the mayor may be appealed to the council at the next regular council meeting following the mayor's decision. The council's decision shall be final.

(2) Utility customers are allowed an adjustment to their water utility bill due to undetected leaks. If the applicant states that there was a faulty pipe and/or fixture on the customer's premises which caused a large consumption of water, the existence of a faulty pipe and/or fixture shall be verified by inspection by public works employees, and/or by documentary and/or photographic proof supplied by the customer. If it is established by inspection or documentation that such faulty pipe and/or fixture has been repaired, a reduction of the bill for a single billing cycle to an amount that is the average of the same three months of the prior year's billings shall be made, the amount not to exceed $300.00 in any case. The reduction provided for in this section shall not be allowed if such excess water consumption is due to a customer's neglect or continued failure to repair the faulty pipe and/or fixture. Such a reduction in billing shall be permitted only two times in any calendar decade for any property (two reductions per decade per metered account, regardless of the customer responsible for the account). Each calendar decade shall begin January 1st of the year ending in zero and end December 31st of the year ending in nine (for example, January 1, 2010, through December 31, 2019; January 1, 2020, through December 31, 2029; and so on), with the date of each reduction based upon the date the application is received by the town.

(3) The mayor, or his designee, is empowered to approve account payment extension agreements upon receipt of a written request to do so from a town utility customer. Upon receipt of such notice from the customer, the mayor, or his designee, shall review the customer's account to ensure an extension is found to be appropriate and as to only enter into an agreement that would require the account be paid in full within no more than six months of said agreement. Any requests made outside of these terms must be submitted to council for prior approval.

(4) Review of adjustments on utility accounts in any amount, other than the standard late fee waivers (up to $30.00), shall be performed by the council member finance and budget liaison during monthly reviews and approved by signature.

(5) The town staff shall furnish any and all adjustment records upon request, including the standard adjustment(s) listed in subsection (4) of this section.

(6) The town staff shall use their best judgement and investigate and review requests thoroughly prior to processing any adjustments or entering into any agreements. Staff shall submit to council any requests received that they feel uncomfortable processing without the verbal approval from council, including those submitted by themselves, any staff, family members, or any other known persons that may be a conflict of interest.

(7) The application by the customer shall be on the forms provided by the town. (Ord. 621 § 1, 2019; Ord. 593, 2017; Ord. 582 § 3, 2016; Ord. 550 § 2, 2012)

13.15.080 Liens and claims against property for delinquent accounts.

(1) *Water Service.* All delinquent rates and charges for water service furnished and for a connection with the water, together with the penalties and interest thereon as provided in CMC 13.15.030, shall become a lien against the property to which such service is furnished or such connection is made. The town's collection procedure shall conform to RCW 35.21.217, 35.21.290, and 35.21.300, as amended, which are adopted herein and made a part of this title. Future changes to these codes by the legislature will be adopted without further changes to this chapter by ordinance.

(2) *Sewer Service.* All delinquent rates and charges for sewer service furnished and for a connection to the sewer system, together with the penalties and interest thereon, shall become a lien upon the property to which such sewer service is furnished or such connection made. Enforcement of such lien or liens shall be in a manner authorized under RCW 35.67.200, 35.67.215, and 35.21.300, as amended, which are adopted herein and made a part of this title. Future changes to these codes by the legislature will be adopted without further changes to this chapter by ordinance. (Ord. 655 § 5, 2022; Ord. 550 § 2, 2012)

13.15.090 Termination of water service.

As an additional and concurrent method of enforcing the lien of the town for the charges referred to in CMC 13.15.080(1) or any other sewer charges, the town may terminate the water service from the premises to which such services were furnished or remove that water meter thereon, and such water service shall remain terminated until all such charges plus penalties and interest thereon, together with the charges provided for in the water rate schedule for turning the water off and turning the water on or reinstalling such water meter, shall have been paid. Utility services shall be terminated using the following procedure:

(1) If requested by the customer as provided in CMC 13.15.030, a hearing by the mayor or his designee shall be held not more than five business days after receipt of the request from the customer. The customer shall have the right to come to said hearing and present evidence why such utilities should not be terminated.

(2) Any hearing under this chapter shall be conducted during normal business hours, on an informal basis. A record of the hearing, including the date of hearing, who was present, and the findings made as to whether or not the bill was justly owing and the reasons therefor shall be made in writing. The written finding shall be filed on the town utility system record.

(3) Whenever notice of termination is required under this chapter for utility termination, such notice shall inform the customer of his or her right to a hearing, the current phone number and address of Town Hall where a hearing may be requested, the normal business hours to phone in for a hearing, and the time periods involved if the hearing is requested as to utility termination. (Ord. 550 § 2, 2012)

13.15.100 Termination of sewer service.

(1) As an additional and concurrent method of enforcing the lien authorized by this chapter and Chapter 35.67 RCW, the town may elect to enforce said lien by terminating the water service from the premises to which sewer service was furnished after the sewer charges become delinquent and unpaid as defined by this chapter.

(2) Water service shall not be restored until all charges, including penalties and interest, and the expense of removal, closing and restoration have been paid.

(3) Change of ownership or occupancy of premises found delinquent shall not be cause for reducing or eliminating the penalties set forth in this chapter. (Ord. 655 § 6, 2022)

Chapter 13.20
UTILITY TAX APPLICABLE

Sections:

13.20.010 Utility tax applicable.

Utility services provided pursuant to this title are subject to all applicable sections of Chapter 3.85 CMC governing the town utility tax. (Ord. 550 § 2, 2012)

Chapter 13.25
WATER SERVICE CONNECTION

Sections:

13.25.010 Service connections.

Each residence or family dwelling unit, each commercial or individual customer and each public or private building not otherwise classified shall have a separate service connection to the public service as approved by the public works superintendent. A "family dwelling unit" is defined as a single unit having water use facilities equivalent in extent to a normal dwelling. Multiple-dwelling units with more than two units, such as rooming houses or boardinghouses or apartment houses, auto courts, hotels, rest homes, or trailer camps or condominiums, which have community water use facilities may be served by a single service, subject to the provisions of the water rate schedule. It shall be unlawful for any person whose premises are supplied with water from the town mains to furnish water to additional premises. (Ord. 550 § 2, 2012)

13.25.015 Water service – Connection.

The town will maintain all existing service connections, including the meter facilities, subject to the regulations hereinafter included. The house connection shall be installed and maintained by the customer at his own expense and in accordance with the standards established by the town public works department. (Ord. 550 § 2, 2012)

13.25.020 Installation and maintenance responsibilities of customer.

(1) The customer shall, at his own risk and expense, furnish, install and maintain in safe condition all equipment that may be required for receiving, controlling and utilizing water as the house connection. The public works department shall not be responsible for any loss or damage caused by the improper installation, maintenance, wrong acts, or negligence of the customer or any of his tenants, agents, employees, contractors or licensees, in installing, maintaining, using or operating such equipment.

(2) The town shall not be responsible for any damage to property caused by spigots, faucets, valves, and other equipment that may be opened, or to water heaters or other appliances which may be powered, when service is turned on at the meter in the original installation, or when restoration of service is made after a temporary shutdown.

(3) The public works department shall have the right to order the installation of check valves on any service where it shall determine it to be necessary to protect the water system against hot water or contaminated or stagnated water backing into the town mains. The number, location and type of check valves to be used shall be fixed and approved by the water department. The public works department shall have the power to disconnect any service if the installation of check valve or valves has not been made within 10 days after written notice has been served. (Ord. 550 § 2, 2012)

13.25.030 Metered services.

(1) Each service shall be separately metered. Charges for all water use shall be on a metered rate basis as determined by the classification of the service and the applicable rate schedule.

(2) The public works department will furnish, install and maintain a service of such size and location as the applicant may reasonably request from its water distribution main to the property line, or to the easement right-of-way line. Cost of a new service connection shall be as provided in the rate schedule.

(3) The meters, whether installed on town or private property, shall be the property of the town. The applicant, as a condition of his contract for water service, guarantees access to the meter for purposes of reading and maintenance thereof.

(4) No service shall be turned on or off except by an authorized agent of the public works department. The superintendent may authorize a plumber licensed by the state of Washington to turn a service off or on. A property owner may turn off a water service on the customer's side of the meter in case of an actual emergency.

(5) The owner or occupant of premises served from the municipal water system shall be responsible for all leaks or damages on account of leaks from the service pipe from the town's stop cock or meter to the premises served. (Ord. 550 § 2, 2012)

13.25.040 Connection fees.

(1) A connection fee of $100.00 shall be levied and collected by the town for any new development, expansion of use, change of occupancy, or increase in meter size that is found to place additional demand on the town's water system pursuant to CMC 13.10.060.

(2) Persons or firms connecting to water mains or lines or related facilities which have been specially constructed at a cost paid by the town, but not pursuant to local improvement district bonds or through developer funding, which connection shall go to the improvement of the property of the person or firm's connection to said water line, shall pay a cost reimbursement fee to the town based on said person or firm's proportionate share of the costs incurred by the town. (Ord. 550 § 2, 2012)

13.25.050 Service outside town limits.

The public works department, upon approval of the town council, may furnish water service to applicants adjacent to or within normal distance from existing water mains. (Ord. 550 § 2, 2012)

13.25.060 Acquiring water during emergency – Metering requirements – Billing.

The mayor or public works superintendent shall be authorized to purchase on a temporary emergency basis from any other water district, water association, or utility, water as required; all such water so purchased shall be metered. All water sold or purchased on any emergency exchange basis shall be metered both ways and the net water consumed shall be billed at the regular billing interval. (Ord. 550 § 2, 2012)

13.25.070 Fire service.

Services for fire protection must be metered and fitted with such fixtures only as are needed for fire protection and entirely disconnected from those used for other purposes. Persons having such services will be charged not less than the minimum rate charged for metered services where such services are used for other than fire purposes. No charge shall be made for water used in extinguishing fires if the owner or occupant of premises where such fire occurs gives written notice to the water department within 30 days from the time of such fire. The entire cost of such fire service connection from the town's main to the connection with the premises served shall be at the expense of the applicant, who shall deposit the estimated cost thereof at the time of making application therefor. Such service connection after installed shall be the property of the town. In no case shall any tap be made upon any pipe used for fire service purposes, or any tank connected therewith, nor shall the use of any water be permitted through any pipes, tank or other fixtures therewith connected except the extinguishing of fire on the premises. (Ord. 550 § 2, 2012)

Chapter 13.30
WATER FLUORIDATION

Sections:

13.30.010 Added to water supply – Administration.

A source of fluoridation approved by the State Department of Health shall be added to the water supply of the town of Cathlamet, under the rules and regulations of the Washington State Board of Public Health, such addition to be administered in a manner approved by the State Director of Public Health. (Ord. 550 § 2, 2012)

13.30.020 Equipment authorization.

The town council and/or public works department of the town of Cathlamet shall be authorized to acquire, purchase, construct, install, operate and maintain in the manner provided by law any and all fluoridation equipment required to carry out the provisions of this chapter. (Ord. 550 § 2, 2012)

Chapter 13.35
WATER USE REGULATIONS

Sections:

13.35.010 Purpose.

In order to provide for the public health and safety, water service is furnished to customers subject to the general restrictions set out in CMC 13.35.015 through 13.35.120. (Ord. 550 § 2, 2012)

13.35.015 Application approval – Availability of water.

Application approval shall be conditional upon the availability of water as determined by the town, and upon the payment in full of systems connection fees set forth in this code. (Ord. 550 § 2, 2012)

13.35.020 Refusal of service upon use of unsafe or unlawful apparatus.

The public works department may refuse to furnish water or may discontinue service to any premises where apparatus, appliances or equipment using water is dangerous, unsafe or unlawful. (Ord. 550 § 2, 2012)

13.35.030 Inspection of apparatus – Public works department's right of access.

The public works department does not assume liability for inspecting apparatus on the customer's property. The authorized representative of the public works department shall have access to private premises for the purpose of determining compliance with CMC 13.35.020. (Ord. 550 § 2, 2012)

13.35.040 Refusal of service upon excessive demand by customer.

The public works department may, in the public interest, refuse to furnish water or may discontinue service where excessive demand by one customer may be detrimental to the service which may be furnished to other customers. (Ord. 550 § 2, 2012)

13.35.045 Increase in use.

No person, firm, association or corporation may increase its use of service as stated in the application without giving due notice of such increase. In the event of such increase, the customer will be required to pay the town's regular rates for such increased service from the date of connection with and use of the same. (Ord. 550 § 2, 2012)

13.35.050 Right of public works department to terminate service.

The public works department shall have the right to refuse or to terminate service to any premises to safeguard against fraud or abuse. (Ord. 550 § 2, 2012)

13.35.060 Tampering with public water system.

(1) It is unlawful for any person, firm, or corporation to use water from a fire hydrant or other public connections without authorization from the town, or to otherwise connect to the town water system, or to take water from said system, without authorization from the town. Violation of this subsection is a class 1 civil infraction punishable as set forth in CMC 1.05.010.

(2) Any person who has been issued a notice of violation or order to abate pursuant to this chapter who either willfully fails to respond to the notice of civil violation by payment of the civil penalty or willfully fails to abate from

the unauthorized use of water from the fire hydrant or other public connection by using the water from same without authority for a second time or more often, upon conviction thereof, is guilty of a gross misdemeanor, and shall be punished by a fine not to exceed $5,000, or by imprisonment in the county jail not to exceed 364 days, or both such fine and imprisonment. (Ord. 649 § 1, 2021; Ord. 550 § 2, 2012)

13.35.070 Approval required for abnormal use of water.

Abnormal use of water for filling swimming pools or for similar purposes shall be subject to prior approval of the public works department with regard to the quantity involved and to the time of taking such water. (Ord. 550 § 2, 2012)

13.35.075 Reselling by customers prohibited – Delivery only to customer's premises permitted.

No customer shall resell water received through his service connection, nor shall such water be delivered to premises other than specified in the application for service. This section shall not apply to the Wahkiakum Public Utility District No. 1 and other water wholesalers under contract to the town as approved by the council. (Ord. 550 § 2, 2012)

13.35.090 Equipment and property – Customer's liability for damage.

The customer shall be liable for any damage to the meter or other equipment or property owned by the public works department which results from an overt or negligent act of the customer, his tenants, agents, employees, contractors or licensees. The public works department shall be reimbursed by the customers for any such damage promptly on presentation of a bill. (Ord. 550 § 2, 2012)

13.35.100 Shut-off valve required.

The customer shall install, as close to the meter location as practicable, a suitable shut-off valve in his house connection to the meter that will shut off all service to his premises. (Ord. 550 § 2, 2012)

13.35.110 Nonliability of town for interruption of service.

The town shall not be liable for damages resulting from interruption of service. Temporary shutdown may be made for the purpose of repairs and improvements. The town shall not be liable for interruptions, shortage or insufficiency of service, or for any loss or damage occasioned thereby, or resulting from accident, act of God, fire, strikes, riot, insurrection, war or other cause beyond its control. (Ord. 550 § 2, 2012)

13.35.120 Water source protection.

Any person, firm or corporation causing damage to any water source, intake well, wellhead, water transmission pipe, reservoir or related capital facilities belonging to or used by the town of Cathlamet for obtaining or providing of public water shall be liable for any actual damages incurred in repairing such facilities or restoring the public water supply or any replacement thereof. All uses identified by the Washington State Department of Health not to be near an established water source are prohibited within a 100-foot radius of such water source. (Ord. 550 § 2, 2012)

Chapter 13.40
WATER CONSERVATION MEASURES

Sections:

13.40.010 Purpose.

The purpose of this chapter is to provide for the declaration of a water supply emergency and the implementation of voluntary and mandatory water conservation measures throughout the town water system in the event such an emergency is declared. (Ord. 550 § 2, 2012)

13.40.020 Definitions.

(1) "Customer" shall mean the customer of record using water for any purpose from the town's water distribution system and for which either a regular charge is made or, in the case of coin sales, a cash charge is made at the site of delivery.

(2) "Waste of water" includes, but is not limited to:

(a) Permitting water to escape down a gutter, ditch, or other surface drain; or

(b) Failure to repair a controllable leak of water due to defective plumbing.

(3) The following classes of uses of water are established:

(a) Class 1: Water used for outdoor watering, either public or private, for gardens, lawns, trees, shrubs, plants, parks, golf courses, playing fields, swimming pools or other recreational area; or the washing of motor vehicles, boats, trailers, or the exterior of any building or structure.

(b) Class 2: Water used for any commercial or industrial use, including agricultural purposes; except water actually necessary to maintain the health and personal hygiene of bona fide employees while such employees are engaged in the performance of their duties at their place of employment.

(c) Class 3: Domestic usage, other than that which would be included in either Class 1 or 2.

(d) Class 4: Water necessary only to sustain human life and the lives of domestic pets and maintain standards of hygiene and sanitation. (Ord. 550 § 2, 2012)

13.40.030 Declaration of a water emergency.

Whenever the governing body of the town finds that an emergency exists by reason of a shortage of water supply needed for essential uses, the mayor shall be empowered to declare that a water supply emergency exists and will encourage voluntary water conservation or impose mandatory restrictions on water use during the period of the emergency. Such an emergency shall be deemed to continue until it is declared by resolution of the council to have ended. The mayor's declaration and council's resolution declaring the existence and end of a water supply emergency shall be effective upon their publication in the official town newspaper, or by other delivery of notice to customers. (Ord. 550 § 2, 2012)

13.40.040 Voluntary conservation measures.

Upon the declaration of a water supply emergency as provided in CMC 13.40.030, the mayor is authorized to call on all water consumers to employ voluntary water conservation measures to limit or eliminate nonessential water uses including, but not limited to, limitations on the following uses:

(1) Sprinkling of water on lawns, shrubs or trees (including golf courses);

(2) Washing of automobiles;

(3) Use of water in swimming pools, fountains and evaporative air conditioning systems;

(4) Waste of water. (Ord. 550 § 2, 2012)

13.40.050 Mandatory conservation measures.

Upon the declaration of water supply emergency as provided in CMC 13.40.030, the mayor is also authorized to implement certain mandatory water conservation measures, including, but not limited to, the following:

(1) Suspension of new connections to the town's water distribution system, except connections of fire hydrants and those made pursuant to agreements entered into by the town prior to the effective date of the declaration of emergency;

(2) Restrictions on the uses of water in one or more classes of water use, wholly or in part;

(3) Restrictions on the sales of water at coin-operated facilities or sites;

(4) The imposition of water rationing based on any reasonable formula including, but not limited to, the percentage of normal use and per capita or per consumer restrictions;

(5) Complete or partial bans on the waste of water; and

(6) Any combination of the foregoing. (Ord. 550 § 2, 2012)

13.40.060 Emergency water rates.

Upon the declaration of a water supply emergency as provided in CMC 13.40.030, the governing body of the town shall have the power to adopt emergency water rates by ordinance designed to conserve water supplies. Such emergency rates may provide for, but are not limited to:

(1) Higher charges for increasing usage per unit of the use (increasing block rates);

(2) Uniform charges for water usage per unit of use (uniform unit rate); or

(3) Extra charges in excess of a specified level of water use (excess demand surcharge). (Ord. 550 § 2, 2012)

13.40.070 Regulations.

During the effective period of any water supply emergency as provided for in CMC 13.40.030, the mayor is empowered to promulgate such regulations as may be necessary to carry out the provisions of this chapter, any water supply emergency resolution, or emergency water rate ordinance. Such regulations shall be subject to the approval of the governing body at its next regular or special meeting. (Ord. 550 § 2, 2012)

13.40.080 Violations – Disconnections – Penalties.

(1) If the mayor, public works superintendent, or other town official or officials charged with implementation and enforcement of this chapter or a water supply emergency resolution or ordinance learn of any violation of any

water use restrictions imposed pursuant to CMC 13.40.050 and 13.40.070, a written notice of the violation shall be affixed to the property where the violation occurred and the customer of record and any other person known to the town who is responsible for the violation or its correction shall be provided with either actual or mailed notice. The notice shall describe the violation and the order that it be corrected, cured or abated immediately or within such specified time as the town determines is reasonable under the circumstances. If the order is not complied with, the town may terminate water service to the customer subject to the following procedures:

(a) The town shall give the customer notice by mail or actual notice that the water service will be discontinued within a specified time due to the violation and that the customer will have the opportunity to appeal the termination by requesting a hearing scheduled before the town governing body or a town official designated as a hearing officer by the governing body;

(b) If such a hearing is requested by the customer charged with the violation, he or she shall be given a full opportunity to be heard before termination is ordered; and

(c) A fee of $50.00 shall be paid for the reconnection of any water service terminated pursuant to this subsection (1). In the event of subsequent violations, the reconnection fee shall be $200.00 for the second violation and $300.00 for any additional violations.

(2) Violation of this chapter shall be an infraction and may be prosecuted in municipal court. Each day's violation shall constitute a separate infraction. The penalty for an initial violation shall be a mandatory fine of $150.00. The penalty for a second or subsequent conviction shall be a mandatory fine of $300.00.

(3) The criminal and civil penalties above described are nonexclusive. They need not be used in conjunction with each other, and their enumeration herein shall not prevent the town from taking advantage of any other remedy to which it may be entitled. (Ord. 550 § 2, 2012)

13.40.090 Emergency termination.

Nothing in this chapter shall limit the ability of any properly authorized town official from terminating the supply of water to any or all service connections as required to protect the health and safety of the public. (Ord. 550 § 2, 2012)

Chapter 13.45
SAFETY AND DAMAGE PREVENTION REQUIREMENTS

Sections:

13.45.010 Findings.

It is hereby found and declared that the public health, welfare and safety necessitate the exercise of due care and diligence to prevent damage to public works, fire protection, energy, and communications assets incidental to construction and work performed in the town of Cathlamet. (Ord. 550 § 2, 2012)

13.45.020 Safety and damage prevention responsibilities.

It shall be the responsibility of property owners, their agents, and assigns to exercise due diligence in conducting construction, repair, amendment, or remodeling work on any property, structure, or fixture in the town of Cathlamet. At a minimum, due diligence includes, but is not limited to:

(1) Securing all permits and approvals required for said work;

(2) Obtaining and completing acceptable locating services to properly identify and mark all water, sewer, fire mains, electrical power, communications, gas, and other subsurface utilities in advance of the commencement of excavation or other work which may reasonably impact or endanger said utilities;

(3) Complying with RCW 19.122.030 and 19.122.040 and other applicable laws; and

(4) Providing a minimum of two business days' advance written notification to the public works supervisor of intent to excavate or perform such other work. (Ord. 550 § 2, 2012)

13.45.030 Public works oversight.

Upon receipt of notice of intent to excavate or perform other work pursuant to CMC 13.45.020, it shall be the duty of the public works superintendent to arrange for a town employee or agent to attend the work, monitor its performance, and assist those performing the work in avoiding damage to utilities. Inability of the public works superintendent to provide such oversight shall not excuse or indemnify those performing the work from taking due care to avoid damaging utilities. (Ord. 550 § 2, 2012)

13.45.040 Penalties for failure to request public works oversight.

Notwithstanding RCW 19.122.070, and any other provision of law, failure to request public works oversight shall be subject to the following penalties:

(1) Where no damage to utilities or public property occurs, the penalty shall be $100.00 for each occurrence.

(2) Where any damage to utilities or public property occurs, the penalty shall be $500.00, plus the actual costs for labor, material, and loss of service incurred to repair and rectify the damage.

(3) The public works superintendent shall prepare a claim against the property owner for all penalties assessed pursuant hereto, and the clerk-treasurer shall bill the property owner(s) of record. Unpaid penalty bills shall accrue interest at 12 percent per annum, and become a lien against the property which runs with the land until paid, and may be foreclosed as provided by law. (Ord. 550 § 2, 2012)

Chapter 13.50
CROSS CONNECTIONS

Sections:

13.50.010 Definitions.

Except where specifically designated herein, all words used in this chapter shall carry their customary meanings. Words used in the present tense include the future and plural words include the singular. The word "shall" is always mandatory, and the word "may" denotes a use of discretion in making a decision. Any definition not found in this section will take its meaning from Chapter 246-290 WAC, or as amended.

(1) "Air gap" means a physical separation between the free-flowing end of a potable water supply pipeline and the overflow rim of an open or nonpressure-receiving vessel. To be an "approved air gap," the separation must be at least twice the diameter of the inlet piping (supply pipe) measured vertically, and never be less than one inch.

(2) "Approved backflow prevention assembly" or "backflow assembly" or "assembly" means an assembly to counteract back pressures or prevent backsiphonage. This assembly must appear on the list of approved assemblies issued by the Washington State Department of Health.

(3) "Auxiliary supply" means any water source or system other than the town of Cathlamet water.

(4) "Backflow" means the flow of water or other liquids, gases or solids from any source back into the distribution system. The flow of water in the opposite direction of its intended flow.

(5) "Backflow assembly tester" means a person holding a valid BAT certificate issued in accordance with the WAC.

(6) "Backpressure" means a pressure caused by a pump, elevated tank or piping, boiler, or other means that is greater than the pressure provided by the public water system and which may cause backflow.

(7) "Backsiphonage" shall mean backflow due to a reduction in system pressure in the purveyor's distribution system and/or consumer's water system.

(8) "Building inspector" shall mean the building inspector for the town of Cathlamet.

(9) "Cathlamet" shall mean the town of Cathlamet.

(10) "Closed system" means any water system or portion of a water system in which water is transferred to a higher pressure zone closed to atmosphere.

(11) "Contamination" means the entry into or presence in a public water supply system of any substance which may be deleterious to health and/or quality of the water.

(12) "Cross connection" means any physical arrangement where a public water system is connected, directly or indirectly (actual or potential), with any other nondrinkable water system or auxiliary system, sewer, drain conduit, swimming pool, storage reservoir, plumbing fixture, swamp coolers, or any other device which contains, or may contain, contaminated water, sewage, or other liquid of unknown or unsafe quality which may be capable of imparting contamination to the public water system as a result of backflow. Bypass arrangements, jumper connections, removable sections, swivel or changeover devices, or other temporary or permanent devices through which, or because of which, backflow may occur are considered to be cross connections.

(13) "Cross connection specialist" or "CCS" shall mean a person holding a valid CCS certificate issued in accordance with the WAC.

(14) "Cross connection control manager" means a person or his/her designee appointed to manage the cross connection control program for the town.

(15) "Degree of hazard" means the low or high hazard classification that shall be attached to all actual or potential cross connections.

(16) "DOH" means Washington Department of Health.

(17) "Double check detector assembly" or "DCDA" means an assembly which consists of two independently operating check valves which are spring-loaded or weighted. The assembly comes complete with a shut-off valve on each side of the checks, as well as test cocks to test the checks for tightness. It shall also be provided with a factory bypass feature of a minimum of an approved double check assembly.

(18) "Double check valve backflow prevention assembly" or "double check assembly" or "double check" or "DCVA" or "DC" means an assembly which consists of two independently operating check valves which are spring-loaded or weighted. The assembly comes complete with a shut-off valve on each side of the checks, as well as test cocks to test the checks for tightness.

(19) "Health hazard" means an actual or potential threat of contamination of a physical, toxic or biological nature that would be a danger to health.

(20) "High hazard" means the classification assigned to an actual or potential cross connection that potentially could allow a substance that may cause illness or death to backflow into the potable water supply.

(21) "In-premises protection" means a method of protecting the health of consumers served by the customer's plumbing system (i.e., located within the property lines of the customer's premises) by the installation of an approved air gap or backflow prevention assembly at the point of hazard.

(22) "Inspector" or "surveyor" shall mean a person holding a valid CCS certificate issued in accordance with the WAC, who meets the stipulations in this title and the most recent edition of the town's SOP manual.

(23) "Local administrative authority" means the local official, board, department or agency authorized to administer and enforce the provisions of the Uniform Plumbing Code and all other plumbing codes recognized by the state of Washington.

(24) "Low hazard" means the classification assigned to an actual or potential cross connection that potentially could allow a substance that may be objectionable, but not hazardous to one's health, to backflow into the potable water supply.

(25) "Mobile unit" shall mean units connecting to the water system through a hydrant, hose bib, or other appurtenance of a permanent nature that is part of the town water system or a permanent water service to a premises. Examples can include but are not limited to the following: water trucks, pesticide applicator vehicles, chemical mixing units or tanks, waste or septage haulers, trucks or units, sewer cleaning equipment, carpet or steam cleaning equipment other than homeowner use, rock quarry or asphalt/concrete batch plants, or any other

mobile equipment or vessel. Uses that are excluded from this definition are recreational vehicles at assigned sites or parked in accordance with other town ordinances pertaining to recreational vehicles, and homeowner devices that are used by the property owner in accordance with other provisions of this, or other, town of Cathlamet ordinances pertaining to provision of water service to premises.

(26) “Person” means a natural person (individual), corporation, company, association, partnership, firm, limited liability company, joint venture company or association, and other such entity.

(27) “Plumbing hazard” means an internal or plumbing-type cross connection in a consumer’s potable water system that may be either a pollutional or a contamination-type hazard. This includes, but is not limited to, cross connections to toilets, sinks, lavatories, wash trays, domestic washing machines and lawn sprinkling systems. Plumbing-type cross connections can be located in all types of structures including but not limited to homes, apartment houses, hotels and commercial or industrial establishments.

(28) “Point-of-use isolation” shall mean the same as “in-premises protection.”

(29) “Pollutional hazard” means an actual or potential threat to the physical properties of the water system or the potability of the public or the consumer’s potable water system but which would not constitute a health or system hazard, as defined. The maximum degree of intensity of pollution to which the potable water system could be degraded under this definition would cause a nuisance or be aesthetically objectionable or could cause minor damage to the system or its appurtenances.

(30) “Potable water supply” means any system of water supply intended or used for human consumption or other domestic use.

(31) “Premises” means any piece of property to which water is provided including, but not limited to, all improvements, mobile structures and structures located on it.

(32) “Premises isolation” means a method of protecting a public water system by installation of an approved air gap or approved backflow prevention assembly at the point of service (end of purveyor’s service pipe) to separate the customer’s plumbing system from the purveyor’s distribution system.

(33) “Reduced pressure principle backflow prevention assembly” or “reduced pressure principle assembly” or “RP assembly” shall mean an assembly containing two independently acting approved check valves together with a hydraulically operated, mechanically independent pressure differential relief valve located between the check valves and at the same time below the first check valve. The assembly shall include properly located test cocks and tightly closing shut-off valves at each end of the assembly.

(34) “SOP” means the most recent edition of the town of Cathlamet’s standard operating procedures manual.

(35) “Superintendent” means public works superintendent of the town of Cathlamet or his/her designee.

(36) “System hazard” means an actual or potential threat of severe danger to the physical properties of the public or consumer’s potable water system or of a pollution or contamination which would have a detrimental effect on the quality of the potable water in the system.

(37) “Thermal expansion” means the pressure created in piping, when water is heated.

(38) "Town" or "the town" shall mean the town of Cathlamet, Washington.

(39) "UPC" means Uniform Plumbing Code.

(40) "Used water" means any water supplied by the town to a customer's property after it has passed through the service connection and is no longer under the control of the town.

(41) "WAC" means all regulations and amendments found in the most recent edition of the Washington Administrative Code which pertain to backflow and cross connections. (Ord. 550 § 2, 2012)

13.50.020 Purpose.

The purpose of this chapter is to protect the public water system from contamination or pollution due to any existing or potential cross connections as defined in WAC 246-290-010, or as amended, and this chapter. The purveyor shall ensure that cross connections between the distribution system and a customer's premises are eliminated or protected against by the installation of an approved air gap or approved backflow prevention assembly. (Ord. 550 § 2, 2012)

13.50.030 Cross connections regulated.

(1) No cross connections shall be created, installed, used or maintained within the territory served by the town, except in accordance with this chapter.

(2) The CCC manager for the town shall carry out or cause inspections to be carried out to determine if any actual or potential cross connection exists. If found necessary, an assembly commensurate with the degree of hazard will be required to be installed at the service connection.

(3) The owner, occupant or person in control of the property is responsible for all cross connection control within the premises.

(4) The use of any type of chemical spray attachment connected to the premises' plumbing, including but not limited to garden hose fertilizers and pesticide applicators, is prohibited except in accordance with this chapter.

(5) The use of any type of radiator flush kits or any other type of attachment connected to the premises' plumbing is prohibited except in accordance with this chapter. (Ord. 550 § 2, 2012)

13.50.040 Application and responsibilities.

This chapter applies throughout the town of Cathlamet and to every premises and property served by the town of Cathlamet water system. It applies to any premises, public or private, regardless of date of connection to the town water. Every owner, occupant and/or person in control of any concerned premises is responsible for compliance with the terms and provisions contained herein. (Ord. 550 § 2, 2012)

13.50.050 Backflow prevention assembly requirements.

A CCS employed by or under contract with the town shall determine the type of backflow assembly to be installed within the area served by the town. All assemblies shall be installed at the service connection unless it is determined by the CCS to install the assembly at the point of use. An assembly will be required in each of the following circumstances, but the CCS is in no way limited to the following circumstances:

(1) The nature and extent of any activity on the premises, or the materials used in connection with any activity on the premises, or materials stored on the premises, could contaminate or pollute the potable water supply.

(2) Premises having any one or more cross connections or potential cross connections as that term is defined in this chapter and the WAC.

(3) When an appropriate cross connection survey report form has not been filed with the CCC manager.

(4) Internal cross connections are present that are not correctable.

(5) Intricate plumbing arrangements or plumbing potentially subject to frequent changes are present that make it impractical to ascertain whether or not cross connections exist.

(6) There is a repeated history of cross connections being established or re-established.

(7) All lawn irrigation systems.

(8) There is unduly restricted entry so that inspections for cross connections cannot be made with sufficient frequency to assure that cross connections do not exist.

(9) Materials are being used such that, if backflow should occur, a health hazard could result.

(10) Installation of an approved backflow prevention assembly is deemed to be necessary to accomplish the purpose of these regulations in the judgment of the town.

(11) Any premises having an auxiliary water supply.

(12) When a building is constructed on commercial premises, and the end use of such building is not determined, or could change, a reduced pressure principle backflow prevention assembly will be installed at the service connection.

(13) There exists any used or reclaimed water return system.

(14) If it is determined that additions or rearrangements have been made to the plumbing system without obtaining proper permits as required by the code enforcement division, premises isolation will be required.

(15) All high health cross connection hazard premises which are defined in Table 9 of WAC 246-290-490, or as amended, are required to have premises isolation by installing an approved air gap or reduced pressure principle assembly in accordance with this chapter. (Ord. 550 § 2, 2012)

13.50.060 Irrigation systems.

The type of assembly to be installed on an irrigation system will be commensurate with the degree of hazard but in no case less than a DCVA. The location of the assembly will be determined by the town's CCS. (Ord. 550 § 2, 2012)

13.50.070 Fire systems.

(1) An approved double check detector backflow prevention assembly ("DCDA") shall be the minimum protection on all new fire sprinkler systems using piping material that is not approved for potable water use, and/or that does not provide for periodic flow-through during each 24-hour period. A reduced pressure principle detector backflow prevention assembly ("RPDA") must be installed, if any solution other than the potable water can be introduced into the sprinkler system. Retrofitting on fire sprinkler systems will be required in each of the following circumstances:

(a) Where improper maintenance has occurred;

(b) On all high hazard systems;

(c) Wherever an inspector deems necessary; and

(d) Wherever required by the WAC.

(2) All fire line systems which are on a designated lateral shall install the assembly on the lateral. The assembly must be installed in accordance with this chapter. (Ord. 550 § 2, 2012)

13.50.080 Wholesale customers.

Any customer that has a wholesale contract for water services with the town must have an active, ongoing cross connection program. The cross connection program must be in compliance with WAC requirements pertaining to public water systems. The town reserves the right at all times to require a reduced pressure principle assembly at the interconnect. Wholesale customers shall provide to the town a copy of their cross connection control annual summary report which was submitted to the DOH each year. (Ord. 550 § 2, 2012)

13.50.090 Mobile units.

(1) Any mobile unit or apparatus, as defined in CMC 13.50.010, which uses the water from any premises within the town's water system, shall first obtain a permit from the town and be inspected to assure appropriate backflow prevention is installed in accordance with the most recent edition of the SOP manual.

(2) The town reserves the right to revoke the business license of the owner of the apparatus or mobile unit if the owner fails to comply with above procedures. (Ord. 550 § 2, 2012)

13.50.100 Right-of-way encroachment.

(1) No person shall install or maintain a backflow prevention assembly upon or within any town right-of-way except as provided in this section.

(2) The town reserves the right to have an assembly installed in the right-of-way.

(3) A backflow prevention assembly required by the town may be installed upon or within any town right-of-way only if the owner proves to the town that there is no other feasible location for installing the assembly, and installing it in the right-of-way will not interfere with traffic or utilities. The town retains the right to approve the location, height, depth, enclosure, and other requisites of the assembly prior to its installation.

(4) All permits required by the town code to perform work in the right-of-way shall be obtained.

(5) The assembly shall be installed below or flush with the surrounding grade except when it is not practicable to install it in this manner. Any assembly or portion of an assembly which extends aboveground shall be located no closer than 18 inches to the face of the curb.

(6) A property owner shall, at the request of the town and at the owner’s expense, relocate a backflow prevention assembly which encroaches upon any town right-of-way, when such relocation is necessary for street or utility construction or repairs for purposes of public safety.

(7) A person commits an offense if he/she fails to relocate a backflow prevention assembly located in or upon any town right-of-way after receiving a written order from the town to do so. (Ord. 550 § 2, 2012)

13.50.110 Plumbing code.

As a condition of water service, customers shall install, maintain, and operate their piping and plumbing systems in accordance with the UPC and all Washington State plumbing laws. (Ord. 550 § 2, 2012)

13.50.120 Access to premises.

Authorized employees of the town, with proper identification, shall have access during the hours of 8:00 a.m. to 5:00 p.m. to all parts of a premises and within the building to which water is supplied. If any water user refuses access to a premises or to the interior of a structure during these hours for inspection by a cross connection specialist appointed by the town, a reduced pressure principle assembly shall be installed at the service connection to that premises. (Ord. 550 § 2, 2012)

13.50.130 Testing and repairs.

Backflow prevention assemblies shall be tested in accordance with the requirements set out in the WAC, or as amended, this title and the most recent edition of the town’s SOP manual. (Ord. 550 § 2, 2012)

13.50.140 Responsibilities of backflow prevention assembly testers.

All backflow assembly testers operating within the town shall be certified in accordance with all applicable regulations of the WAC and shall comply with all of the stipulations in this enforcement document and the most recent edition of the town's SOP manual. (Ord. 550 § 2, 2012)

13.50.150 Maintenance of assemblies.

Backflow prevention assemblies shall be maintained in accordance with the requirements set out in the WAC, or as amended, and the most recent edition of the town's SOP manual. (Ord. 550 § 2, 2012)

13.50.160 Installation requirements and specifications.

Backflow prevention assemblies shall be installed in accordance with the requirements set out in the WAC, or as amended, and the most recent edition of the town's SOP manual. (Ord. 550 § 2, 2012)

13.50.170 Thermal expansion.

If a closed system has been created by the installation of a backflow prevention assembly, it is the responsibility of the property owner to eliminate the possibility of thermal expansion. (Ord. 550 § 2, 2012)

13.50.180 Pressure loss.

Any reduction in water pressure caused by the installation of a backflow assembly is not the responsibility of the town. The town will give reasonable assistance to the owner regarding information on adequate sizing of assemblies and proper plumbing practices to provide for required pressure and flows for fire protection. (Ord. 550 § 2, 2012)

13.50.190 Parallel installation.

Premises where noninterruption of water supply is critical shall be provided with two assemblies of the same type installed in parallel. They shall be sized in such a manner that either assembly will provide the minimum water requirements while the two together will provide the maximum water requirements. (Ord. 550 § 2, 2012)

13.50.200 New construction.

(1) In all new construction, an approved backflow assembly shall be installed at the service connection. The type of the assembly will be commensurate with the degree of hazard as determined by an inspector.

(2) When a building is constructed on commercial premises, and the end use of the building is not determined or could change, a reduced pressure principle backflow prevention assembly shall be installed at the service connection to provide protection of the public water supply in the event of the most hazardous use of the building. (Ord. 550 § 2, 2012)

13.50.210 Residential service connections.

Any residential property which has been determined to have an actual or potential cross connection and/or has violated the plumbing code or this chapter in any way shall be required to install an approved backflow prevention assembly in accordance with this chapter. (Ord. 550 § 2, 2012)

13.50.220 Rental properties.

The property owner is responsible for the installation, testing and repair of all backflow assemblies on their property. When the tenants change, or if the plumbing is altered in any way, it is the responsibility of the owner to notify the town. (Ord. 550 § 2, 2012)

13.50.230 Retrofitting.

Retrofitting shall be required on all service connections where an actual or potential cross connection exists, and wherever else the town deems retrofitting necessary. (Ord. 550 § 2, 2012)

13.50.240 Costs of compliance.

All costs associated with purchase, installation, inspections, testing, replacement, maintenance, parts, and repairs of the backflow assembly are the financial responsibility of the property owner. (Ord. 550 § 2, 2012)

13.50.250 Termination of service.

Failure on the part of any property owner, their renter, agent or personal representative to discontinue the use of all cross connections or to physically separate cross connections in accordance with this chapter is sufficient cause for the immediate discontinuance of public water service to the premises. (Ord. 550 § 2, 2012)

13.50.260 Emergency suspension of service.

The superintendent or his/her designee may, without prior notice, suspend water service to any premises when such suspension is necessary to stop an actual or potential cross connection as defined in this chapter and the most recent edition of the town's SOP manual. (Ord. 550 § 2, 2012)

13.50.270 Nonemergency suspension of service.

The superintendent or his/her designee may suspend, with 24 hours' notice, the water supply to any premises where the conditions of this chapter or the most recent edition of the town's SOP manual have been violated. (Ord. 550 § 2, 2012)

13.50.280 Penalties.

Any person, firm, corporation or business entity violating this chapter, upon conviction thereof, is guilty of a misdemeanor, and shall be punished by a fine not to exceed $1,000, or by imprisonment in the county jail not to exceed 90 days, or both such fine and imprisonment. Each continuing day's violation under this chapter shall constitute a separate offense. The penal provisions imposed under this chapter shall not preclude Cathlamet from filing suit to enjoin the violation. The town of Cathlamet retains all legal rights and remedies available to it pursuant to local, state and federal law. (Ord. 649 § 2, 2021; Ord. 550 § 2, 2012)

Chapter 13.55
WATER CONNECTIONS IN FLOODPLAINS

Sections:

13.55.010 Denial of unplanned proposed connection.

The town of Cathlamet shall deny any proposed connection to the town of Cathlamet system that is not already planned to be connected to the system and which would be part of an application which involves construction in the 100-year floodplain. (Ord. 550 § 2, 2012)

13.55.020 Denial of proposed connection as part of construction impacts to USFW service wetlands.

The town of Cathlamet shall deny any proposed connection to the town of Cathlamet water system that is not already planned to be connected to the system and which would be part of an application which would involve construction impacts (conversion) to USFW service wetlands of record. (Ord. 550 § 2, 2012)

13.55.030 Application requirements.

All applications for water connection shall verify that planned improvements to properties requesting connections to the system will be constructed outside the 100-year floodplain (as designated by FEMA) and that the planned improvements requesting connections to the system will be constructed outside the designated wetland area. (Ord. 550 § 2, 2012)

13.55.040 Denial of certain proposed connections.

The town of Cathlamet shall deny any proposed connection to the town of Cathlamet water system that would result in direct or indirect impacts to prime forest land/agricultural land as defined by National Resources Conservation Service regarding future development of said areas. Current zoning regulations of the town of Cathlamet and Wahkiakum County shall apply. This restriction shall remain in effect for the term of the RUS loan. (Ord. 550 § 2, 2012)

13.55.050 Application for exception to tap-in restrictions.

Application for exception to the tap-in restrictions set forth above shall be in writing to the town of Cathlamet to be reviewed by the town on a case-by-case basis. All applications determined by the town of Cathlamet to be of merit shall be forwarded to RUS, or its successors, for the purpose of ratification. The decision of RUS regarding service shall be final and binding on any application for which exception is requested. (Ord. 550 § 2, 2012)

13.55.060 Availability of maps.

Maps showing the locations of floodplains and wetlands in the service area shall be available for review at the Cathlamet Town Hall. (Ord. 550 § 2, 2012)

Chapter 13.60
LATECOMER FEES

Sections:

13.60.010 Purpose.

(1) The purpose of this chapter is to define the rules and regulations that will enable the town to enter into contracts with owners of real estate for water or sewer facilities.

(2) For the purpose of this chapter, "water or sewer facilities" and "latecomer fee" shall have the meanings specified in RCW 35.91.015 as it now reads or is hereafter amended. (Ord. 649 § 3, 2021; Ord. 550 § 2, 2012)

13.60.020 Procedure for petitioning the town to contract or connect water or sewer facilities to town water and sewerage system.

(1) Upon receipt of the applicant's statement of project costs, the public works superintendent prepares for the town council a report setting forth:

(a) The total area and frontage of property currently paying or sharing the costs of the construction;

(b) The total area and frontage of property physically and feasibly capable of being served by the system;

(c) The names and mailing addresses of the owners of the property determined to be within the possible service area;

(d) The fair pro rata share of the cost for each property which might tap into the system, determined on an acre, front footage, or other equitable basis;

(e) A determination whether the system is consistent with the facility plan of the department of public works;

(f) A list of other necessary services presently available or planned for the area as part of the adopted plan;

(g) Evidence that the applicant agrees to an annexation covenant for the property to be presently served by the system, if located outside the town limits;

(h) A recommendation whether the application meets the criteria of this chapter and the policies and procedures of the public works superintendent and ought to be accepted.

(2) If the town council accepts the application, it passes a resolution declaring its intent to enter into a latecomer agreement, subject to the further requirements of this chapter.

(3) After the system is completed the applicant must present to the public works director a final statement detailing the actual total project costs, including application fees, design, construction and inspection fees. In addition the applicant must submit “as-built” plans showing the system and the service area.

(4) If both the as-built plans and the final statement of costs are consistent with the improvement contemplated, the town enters into the latecomer agreement.

(5) If the final statement exceeds or is inconsistent with the projected cost, or if the as-built plans significantly differ from the original design, the public works superintendent meets with the applicant to determine the reason for the increased cost or different design.

(6) The public works superintendent makes a further report and recommendation to the town council. The town council may approve, reject, or modify the latecomer agreement. (Ord. 550 § 2, 2012)

13.60.030 Criteria for determining latecomer fees.

Criteria for determining latecomer fees shall be based on the following:

(1) Latecomer fees shall be based on the cost difference between the construction required by the town and the minimum construction required by the appropriate state agency to serve only the proposed constructed water or sewer facilities.

(2) Latecomer fees may be charged on the basis of acreage, by the lot, meter size, fire hydrant requirements, expected usage, or a combination of any of the foregoing, whichever is deemed most appropriate in order to provide for a fair pro rata share of the cost of the water or sewer facilities construction by any owner of real estate who did not contribute to the original cost of the construction, including not only those directly connected thereto, but also users connected to laterals or branches connecting thereto.

(3) Latecomer fees shall be in addition to any and all connection fees, charges, assessments, levies or deposits required by the town. (Ord. 550 § 2, 2012)

13.60.040 Maintenance guarantee bond.

The owner shall provide a maintenance guarantee bond in the amount of 10 percent of the value of the water or sewer facilities construction for a period of one year from the date of final approval and acceptance of the water or sewer facilities. (Ord. 550 § 2, 2012)

13.60.050 Contract time period.

All contracts entered into pursuant to this chapter shall provide for a period not to exceed 15 years for the reimbursement of water or sewer facilities costs. (Ord. 550 § 2, 2012)

13.60.060 Area to be served.

Pursuant to the provisions of this chapter, the area to be served shall be within the boundaries of the town or within the town's service area. (Ord. 550 § 2, 2012)

13.60.070 Collection and disbursements of latecomer fees.

(1) No person, firm or corporation shall be granted a permit or be authorized to tap into or use any water or sewer facilities or extension thereof during the period of time prescribed in such contract without first paying to the town, in addition to all other costs and charges made or assessed for such tap, or use, or for the water lines or sewers constructed in connection therewith, the amount required by the provisions of the contract under which the water or sewer facilities so tapped into or used were constructed.

(2) The town clerk-treasurer shall be the responsible town official for the collection and disbursement of latecomer fees.

(3) All latecomer fees collected shall be disbursed under the terms and conditions of each contract within 60 days after their receipt. (Ord. 550 § 2, 2012)

13.60.080 Administration fees.

The town shall collect five percent, but not less than $50.00 nor more than $500.00, per connection as determined by the latecomer fees contract for the administration costs of said contracts. (Ord. 550 § 2, 2012)

13.60.090 Provisions for removing unauthorized connection taps.

Whenever any tap or connection is made into any contracted water or sewer facilities without payment, the mayor or the mayor's designee may order the public works department to remove such unauthorized tap or connection and all connecting tile or pipe located in the facility right-of-way and dispose of unauthorized material so removed without any liability whatsoever to the town or officials. (Ord. 550 § 2, 2012)

13.60.100 Charging of town water and sewer rates.

Upon approval and acceptance of water or sewer facilities, the town clerk-treasurer shall charge such water and sewer rates authorized by town water and sewer ordinances. (Ord. 550 § 2, 2012)

Chapter 13.65
GENERAL SEWER/WASTEWATER FACILITIES PLAN*

(Reserved)

* **Code reviser's note:** Ordinance 441 adds the facilities plan as an attachment to the ordinance. A copy of the facilities plan is available for public review and examination in the Town Hall office.

Chapter 13.70
BUILDING SEWERS

Sections:

Article II. Use of Public Sewers Required

Article III. Private Sewage Disposal

Article IV. Building Sewers and Connections

Article V. Use of the Public Sewers

Article VI. Industrial Cost Recovery

Article VII. Protection from Damage

Article VIII. Powers and Authority of Inspectors

Article I. Definitions

13.70.010 Generally.

Unless the context specifically indicates otherwise, the meaning of terms used in this chapter shall be as set forth in this article. (Ord. 550 § 2, 2012)

13.70.020 BOD.

"BOD" (denoting biochemical oxygen demand) shall mean the quantity of oxygen utilized in the biochemical oxidation of organic matter under standard laboratory procedure in five days at 20 degrees Celsius, expressed in milligrams per liter. (Ord. 550 § 2, 2012)

13.70.030 Building drain.

"Building drain" shall mean that part of the lowest horizontal piping of a drainage system which receives the discharge from soil, waste, and other drainage pipes inside the walls of the building and conveys it to the building sewers, beginning five feet (1.5 meters) outside the inner face of the building walls. (Ord. 550 § 2, 2012)

13.70.040 Building sewer.

"Building sewer" shall mean the extension from the building drain to the public sewer or other place of disposal. (Ord. 550 § 2, 2012)

13.70.050 Combined sewer.

"Combined sewer" shall mean a sewer receiving both surface runoff and sewage. (Ord. 550 § 2, 2012)

13.70.060 Garbage.

“Garbage” shall mean solid wastes from the domestic and commercial preparation, cooking and dispensing of food, and from the handling, storage and sale of produce. (Ord. 550 § 2, 2012)

13.70.070 Industrial wastes.

(1) “Industrial wastes” shall mean the liquid waste from any nongovernmental user of publicly owned treatment works identified in the current version of Standard Industrial Classification Manual 1987, Office of Management and Budget, as amended and supplemented under the following divisions:

(a) Division A: Agriculture, Forestry, and Fishing;

(b) Division B: Mining;

(c) Division D: Manufacturing;

(d) Division E: Transportation, Communications, Electric, Gas and Sanitary Services;

(e) Division I: Services.

(2) A user in the division listed may be excluded if the public works director determines that it will introduce primarily segregated domestic waste or waste from sanitary conveniences. (Ord. 550 § 2, 2012)

13.70.080 Natural outlet.

“Natural outlet” shall mean any outlet into a watercourse, pond, ditch, lake, or other body of surface or ground water. (Ord. 550 § 2, 2012)

13.70.090 Person.

“Person” shall mean any individual, firm, company, association, society, corporation, or group. (Ord. 550 § 2, 2012)

13.70.100 pH.

“pH” shall mean the logarithm of the reciprocal of the weight of hydrogen ions in grams per liter of solution. (Ord. 550 § 2, 2012)

13.70.110 Properly shredded garbage.

“Properly shredded garbage” shall mean the waste from the preparation, cooking and dispensing of food that has been shredded to such a degree that all particles will be carried freely under the flow conditions normally prevailing in public sewers, with no particle greater than one-half inch (1.27 centimeters) in any dimension. (Ord. 550 § 2, 2012)

13.70.120 Public sewer.

“Public sewer” shall mean a sewer in which all owners of abutting properties have equal rights, and is controlled by public authority. (Ord. 550 § 2, 2012)

13.70.130 Sanitary sewer.

“Sanitary sewer” shall mean a sewer which carries sewage and to which storm, surface, and ground waters are not intentionally admitted. (Ord. 550 § 2, 2012)

13.70.140 Sewage.

“Sewage” shall mean a combination of the water-carried wastes from residences, business buildings, institutions, and industrial establishments, together with such ground, surface and storm waters as may be present. (Ord. 550 § 2, 2012)

13.70.150 Sewage treatment plant.

“Sewage treatment plant” shall mean any arrangement of devices and structures used for treating sewage. (Ord. 550 § 2, 2012)

13.70.160 Sewage works.

“Sewage works” shall mean all facilities for collecting, pumping, treating and disposing of sewage. (Ord. 550 § 2, 2012)

13.70.170 Sewer.

“Sewer” shall mean a pipe or conduit for carrying sewage. (Ord. 550 § 2, 2012)

13.70.180 Shall and may.

“Shall” is mandatory; “may” is permissive. (Ord. 550 § 2, 2012)

13.70.190 Slug.

“Slug” shall mean any discharge of water, sewage, or industrial waste, which in concentration of any given constituent or in quantity of flow exceeds for any period of duration longer than 15 minutes more than five times the average 24-hour concentration or flows during normal operation. (Ord. 550 § 2, 2012)

13.70.200 Storm drain.

“Storm drain” (sometimes termed “storm sewer”) shall mean a sewer which carries storm and surface waters and drainage, but excludes sewage and industrial wastes, other than unpolluted cooling water. (Ord. 550 § 2, 2012)

13.70.210 Superintendent.

“Superintendent” shall mean the town’s public works superintendent or his authorized deputy, agent, or representative. (Ord. 550 § 2, 2012)

13.70.220 Suspended solids.

“Suspended solids” shall mean solids that either float on the surface of, or in suspension in, water, sewage, or other liquids, and which are removable by laboratory filtering. (Ord. 550 § 2, 2012)

13.70.230 Uniform Plumbing Code.

“Uniform Plumbing Code” shall mean the code of that name published by the International Association of Plumbing and Mechanical Officials, 1991 Edition; provided, that Chapters 11 and 12 are not adopted; and provided further, that those requirements of the Uniform Plumbing Code relating to venting of appliances as found in Chapter 13 are not adopted. (Ord. 550 § 2, 2012)

13.70.240 Watercourse.

“Watercourse” shall mean a channel in which a flow of water occurs, either continuously or intermittently. (Ord. 550 § 2, 2012)

Article II. Use of Public Sewers Required

13.70.250 Deposit of objectionable wastes prohibited.

It shall be unlawful for any person to place, deposit, or permit to be deposited in any unsanitary manner on public or private property within the town of Cathlamet, or in any area under the jurisdiction of said town, any human or animal excrement, garbage, or other objectionable waste. (Ord. 550 § 2, 2012)

13.70.260 Discharge of untreated sewage or other untreated waters to natural outlets prohibited.

It shall be unlawful to discharge to any natural outlet within the town of Cathlamet, or in any area under the jurisdiction of said town, any sewage or other polluted waters, except where suitable treatment has been provided in accordance with subsequent provisions of this chapter. (Ord. 550 § 2, 2012)

13.70.270 Construction of sewage disposal facilities prohibited.

Except as hereinafter provided, it shall be unlawful to construct or maintain any privy, privy vault, septic tank, cesspool, or facility intended or used for the disposal of sewage. (Ord. 550 § 2, 2012)

13.70.280 Installation and connection of toilet facilities to public sewer required.

The owner of all houses, buildings, or properties used for human occupancy, employment, recreation, or other purposes, situated within the town of Cathlamet and abutting on any street, alley, or right-of-way in which there is now located or in the future will be located a public sanitary or combined sewer of the town, is hereby required at his expense to install suitable toilet facilities therein, and to connect such facilities directly with the proper public sewer in accordance with the provisions of this chapter, within 90 days after date of official notice to do so; provided, that said public sewer is within 200 feet of the property line. (Ord. 550 § 2, 2012)

Article III. Private Sewage Disposal

13.70.290 Conditions of usage.

Where a public sanitary or combined sewer is not available under the provisions of CMC 13.70.280, the building sewer shall be connected to a private sewage disposal system complying with the provisions of this article. (Ord. 550 § 2, 2012)

13.70.300 Permit required – Application.

Before commencement of construction of a private sewage disposal system the owner shall first obtain a written permit issued by the Wahkiakum County health department. The application for such permit shall be made on a form furnished by the department which the applicant shall supplement by any plans, specifications and other information as are requested by the department. An application fee of $25.00 shall be paid to the department at the time the application is filed. (Ord. 550 § 2, 2012)

13.70.310 Inspections.

A permit for a private sewage disposal system shall not become effective until the installation is completed to the satisfaction of the Wahkiakum County health department. Authorized representatives of the department shall be allowed to inspect the work at any stage of construction and, in any event, the applicant for the permit shall notify the department when the work is ready for final inspection, and before any underground portions are covered. The inspection shall be made within a reasonable time after the receipt of notice by the department. (Ord. 550 § 2, 2012)

13.70.320 Compliance with rules and regulations required – Discharge to natural outlets prohibited.

The type, capacities, location, and layout of a private sewage disposal system shall comply with all recommendations of the Wahkiakum County health department. No permit shall be issued for any private sewage disposal system employing subsurface soil absorption facilities where the area of the lot is less than the area required under the applicable rules and regulations of the Wahkiakum County health department. No septic tank or cesspool shall be permitted to discharge to any natural outlet. (Ord. 550 § 2, 2012)

13.70.330 Public sewer availability – Connection required – Private sewage disposal facilities to be abandoned and filled.

At such time as a public sewer becomes available to a property served by a private sewage disposal system, as provided in CMC 13.70.360, a direct connection shall be made to the public sewer in compliance with this chapter, and any septic tanks, cesspools, and similar private sewage disposal facilities shall be abandoned and filled with suitable material. (Ord. 550 § 2, 2012)

13.70.340 Operation and maintenance requirements.

The owner shall operate and maintain the private sewage disposal facilities in a sanitary manner at all times, at no expense to the town. (Ord. 550 § 2, 2012)

13.70.350 Provisions of article not exclusive.

No statement contained in this article shall be construed to interfere with any additional requirements that may be imposed by the department health officer. (Ord. 550 § 2, 2012)

13.70.360 Public sewer availability – Time period for connection – Private system cleaning requirements.

When a public sewer becomes available, the building sewer shall be connected to said sewer within 60 days and the private sewage disposal system shall be cleaned of sludge and filled with clean bank-run gravel or dirt. (Ord. 550 § 2, 2012)

Article IV. Building Sewers and Connections

13.70.370 Use of public sewer or appurtenance – Permit required.

No unauthorized persons shall uncover, make any connections with or opening into, use, alter, or disturb any public sewer or appurtenance thereof without first obtaining a written permit from the superintendent. (Ord. 550 § 2, 2012)

13.70.380 Building sewer permit classes.

There shall be two classes of building sewer permits:

(1) For residential and commercial service; and

(2) For service to establishments producing industrial waste.

In either case, the owner or his agent shall make application on a special form furnished by the town. The permit application shall be supplemented by any plans, specifications, or other information considered pertinent in judgment of the superintendent. A permit fee and inspection fee shall be charged according to a rate schedule to be hereafter adopted by town ordinance and said fees shall be paid to the town at the time the application is filed. (Ord. 550 § 2, 2012)

13.70.381 Town and control agency permits required.

Owners or agents seeking permits for classes authorized in CMC 13.70.380 must complete an application form provided by the town that provides sufficient information to the town and control agencies to make a determination as to whether or not they comply with all terms of all applicable permits over all requirements for discharges into the receiving waters. The town, at its option, may opt to use a control agency's application form in lieu of its own separate form. Owners or agents are responsible for providing all data and paying all town and control agency fees associated with the permit application. (Ord. 568, 2013)

13.70.382 Violation and penalties.

Owners or agents who fail to obtain approval for all required discharge permits shall be prohibited from placing the applied-for discharges into the sewage system. Placement of such discharges without permitted approval shall be deemed to be in violation as described in Article IX of this chapter, and subject to the fines and penalties set forth therein. (Ord. 568, 2013)

13.70.390 Costs and expenses to be borne by owner.

All costs and expenses incident to the installation and connection of the building sewer shall be borne by the owner. The owner shall indemnify the town from any loss or damage that may directly or indirectly be occasioned by the installation of the building sewer. (Ord. 550 § 2, 2012)

13.70.400 Separate building sewer required for all buildings – Exceptions.

A separate and independent building sewer shall be provided for every building; except where one building stands at the rear of another on an interior lot and no private sewer is available or can be constructed to the rear building through an adjoining alley, court, yard, or driveway, the building sewer from the front building may be extended to the rear building and the whole considered as one building sewer. (Ord. 550 § 2, 2012)

13.70.410 Conditional use of old building sewers.

Old building sewers may be used in connection with new buildings only when they are found, on examination and test by the superintendent, to meet all requirements of this chapter. (Ord. 550 § 2, 2012)

13.70.420 Materials and procedures specifications and requirements.

The size, slope alignment, materials of construction of a building sewer, and the methods to be used in excavating, placing of the pipe, jointing, testing, and back-filling the trench, shall all conform to the requirements of the building and plumbing code or other applicable rules and regulations of the town. In the absence of code provisions or in amplification thereof, the materials and procedures set forth in appropriate specifications of the Association for Standard Test Materials and Uniform Plumbing Code shall be used. (Ord. 550 § 2, 2012)

13.70.430 Elevation requirements.

Whenever possible, the building sewer shall be brought to the building at an elevation below the basement floor. In all buildings in which any building drain is too low to permit gravity flow to the public sewer, sanitary sewage carried by such building drain shall be lifted by an approved means and discharged to the building sewer. (Ord. 550 § 2, 2012)

13.70.440 Prohibited connections.

No person shall make connection of roof downspouts, exterior foundation drains, areaway drains, or other sources of surface runoff or ground water to a building sewer or building drain which in turn is connected directly or indirectly to a public sanitary sewer. (Ord. 550 § 2, 2012)

13.70.450 Building sewer connection into public sewer – Requirements.

The connection of the building sewer into the public sewer shall conform to the requirements of the building and plumbing code or other applicable rules and regulations of the town, or the procedures set forth in appropriate specifications of the A.S.T.M. and Uniform Plumbing Code. All such connections shall be made gas-tight and water-tight. Any deviation from the prescribed procedures and materials must be approved by the superintendent before installation. (Ord. 550 § 2, 2012)

13.70.460 Building sewer connection into public sewer – Inspection notification and supervision required.

The applicant for the building sewer permit shall notify the superintendent that the building sewer is ready for inspection and connection to the public sewer. The connection shall be made under the supervision of the superintendent or his representative. (Ord. 550 § 2, 2012)

13.70.470 Excavation – Restoration.

All excavation for building sewer installation shall be adequately guarded with barricades and lights so as to protect the public from hazard. Streets, sidewalks, parkways, and other public property disturbed in the course of the work shall be restored in a manner satisfactory to the town. (Ord. 550 § 2, 2012)

13.70.480 Side sewer – Responsibility of costs.

(1) Connections to the town's sewer system shall be made by a side sewer lateral from the premises to be served to the town's main sewer line. All costs and expenses incident to the installation, connection, operation and routine maintenance of the entire side sewer lateral from the premises to the town's sewer main shall be borne by the owner of the premises served by the side sewer. All costs and expenses incident to the repair and rehabilitative maintenance of that portion of the side sewer lateral from the building drain to the property line or right-of-way shall be borne by the owner of the premises served by the side sewer. The customer or authorized agent shall be responsible for obtaining all building and right-of-way permits required for work performed either on the premises or within public rights-of-way. All costs and expenses incident to the repair and rehabilitative maintenance of that portion of the side sewer lateral from the property line or right-of-way to the main sewer line shall be borne by the town.

(a) For the purposes of this section, "routine maintenance" means operational maintenance of a side sewer lateral, including, but not limited to, the cleaning or rodding to clear grease or other internal obstructions or substances that have been discharged or allowed to accumulate in the side sewer lateral that may interfere with the operation of the side sewer.

(b) The term "rehabilitative maintenance" means repair and major maintenance of a side sewer lateral, including, but not limited to, construction, reconstruction, or excavation to repair damage to a side sewer lateral caused by external forces or failure of the pipe or pipe material.

(2) The owner of the premises shall indemnify the town from any loss or damage that may directly or indirectly be occasioned by the installation of the side sewer lateral. When the town has occasion to maintain that portion of a side sewer lateral from a street property line or right-of-way to the building drain in order to protect the public sewer or whenever the town has occasion to maintain that portion of a side sewer lateral from the property line or right-of-way to the town's sewer main because of damage directly or indirectly caused by the owner of the premises served by a side sewer lateral or caused by an act or omission of said owner, the cost for such

maintenance shall be charged to said owner. Any costs so charged and not paid within 30 days of the date of billing thereof shall constitute a lien against the property served by the side sewer lateral.

(3) If damage to the sewer lateral was the result of deficiencies caused by acts or omissions of the town or third parties not acting as agents of the customer, and specifically excluding damage to the sewer lateral resulting from deficiencies caused by acts of God, root intrusion from the customer's trees or vegetation, or any other act or omission of the customer or customer's agent(s) or contractor(s), a claim for such reimbursement shall be submitted to the town within 10 days of the incurrence of such costs and shall meet all of the following criteria:

(a) Eligible costs shall include only those actual expenses paid by the customer for any required town permits or to a licensed, bonded contractor.

(b) Only that portion of costs for repair work done within the dedicated right-of-way shall be eligible.

(c) The customer shall submit copies of the itemized invoices from the contractor. Such invoices shall indicate the type and cause or suspected cause of such damage.

(d) The amount of the reimbursement shall not exceed the estimated cost for installation of a new sewer lateral from the main sewer to the property line.

(e) All work shall be in conformance with town codes, ordinances and standards, including obtaining all necessary permits, inspections and approvals. (Ord. 550 § 2, 2012)

Article V. Use of the Public Sewers

13.70.490 Discharges to sanitary sewers.

No person shall discharge or cause to be discharged any storm water, surface water, ground water, roof runoff, subsurface drainage, uncontaminated cooling water, or unpolluted industrial process water to any sanitary sewer. (Ord. 550 § 2, 2012)

13.70.500 Discharges to combined sewers and storm sewers.

Storm water and all other unpolluted drainage shall be discharged to such sewers as are specifically designated as combined sewers or storm sewers, or to a natural outlet approved by the superintendent. Industrial cooling water or unpolluted process waters may be discharged on approval of the superintendent to a storm sewer, combined sewer, or natural outlet. (Ord. 550 § 2, 2012)

13.70.510 Prohibited discharges.

No person shall discharge or cause to be discharged any of the following described water or waters to any public sewers:

(1) Any gasoline, benzene, naphtha, fuel oil, or other flammable or explosive liquid, solid, or gas;

(2) Any waters or wastes containing toxic or poisonous solids, liquids, or gases in sufficient quantity, either singularly or by interaction with other wastes, to injure or interfere with any sewage treatment process, constitute a hazard to humans or animals, create a public nuisance, or create any hazard in the receiving waters of the sewage treatment plant, including but not limited to cyanides in excess of two mg/l or in the wastes as discharged to the public sewer;

(3) Any waters or wastes having any corrosive or destructive properties capable of causing damage or hazard to structures, equipment, processes, systems, or personnel of the sewage works. The following pH limits will apply: a lower pH limit of 5.5 shall apply, except that discharges between 5.0 and 6.0 may be authorized by the public works superintendent when they occur with flows that never exceed 1,000 gallons per day. It shall be the duty of the special user permit holder to request such authorization prior to making such discharges. The special user permit holder shall construct and maintain a practical means of allowing the town access to monitor and measure discharges to ensure compliance with this subsection and other applicable sections of this chapter. The special user permit holder’s means of monitoring shall be constructed and maintained in consultation with, and be subject to the prior approval of, the public works superintendent.

(4) Solid or viscous substances in quantities or of such size capable of causing obstruction to the flow in sewers, or other interference with the proper operation of the sewage works such as, but not limited to, ashes, cinders, sand, mud, straw, shavings, metal, glass, rags, feathers, tar, plastics, wood, undigested garbage, whole blood, paunch manure, hair and flesh, entrails and paper dishes, cups, milk containers, etc., either whole or ground by garbage grinder. (Ord. 568, 2013; Ord. 550 § 2, 2012)

13.70.520 Waste acceptability determination.

No person shall discharge or cause to be discharged the following described substances, materials, waters or wastes if it appears likely in the opinion of the superintendent that such wastes can harm either the sewers, sewage treatment process, or equipment, have an adverse effect on the receiving stream, or can otherwise endanger life, limb, public property, or constitute a nuisance. In forming his opinion as to the acceptability of these wastes, the superintendent will give consideration to such factors as to quantities of subject wastes in relation to flows and velocities in the sewers, materials of construction of the sewers, nature of the sewage treatment process, capacity of the sewage treatment plant, degree of treatability of wastes in the sewage treatment plant, and other pertinent factors. The substances prohibited are:

(1) Any liquid or vapor having a temperature higher than 150 degrees Fahrenheit (65 degrees Celsius);

(2) Any water or waste containing fats, gas, grease, or oils, whether emulsified or not, in excess of 100 mg/l or containing substances which may solidify or become viscous at temperatures between 32 and 150 degrees Fahrenheit (zero and 65 degrees Celsius);

(3) Any garbage that has not been properly shredded. The installation and operation of any garbage grinder equipped with a motor of three-quarter horsepower (0.76 hp metric) or greater shall be subject to the review and approval of the superintendent;

(4) Any waters or wastes containing strong acid iron pickling wastes, or concentrated plating solutions whether neutralized or not;

(5) Any waters or wastes containing iron, chromium, copper, zinc, and similar objectionable or toxic substances; or waste exerting an excessive chlorine requirement, to such degree that any such material received in the composite sewage at the sewage treatment works exceeds the limits established by the superintendent for such materials;

(6) Any waters or waste containing phenols or other taste or odor producing substances, in such concentrations exceeding limits which may be established by the superintendent as necessary, after treatment of the composite sewage, to meet the requirements of the state, federal, or other such discharge to the receiving waters;

(7) Any radioactive wastes or isotopes of such half-life or concentration as may exceed limits established by the superintendent in compliance with applicable state or federal regulations;

(8) Any waters or wastes having a pH in excess of 9.0;

(9) Materials which exert or cause:

(a) Unusual concentrations of inert suspended solids (such as, but not limited to, Fuller's earth, lime slurries, and lime residues) or of dissolved solids (such as, but not limited to, sodium chloride and sodium sulfate);

(b) Excessive discoloration (such as, but not limited to, dye wastes and vegetable tanning solutions);

(c) Unusual BOD, chemical oxygen demand, or chlorine requirements in such quantities as to constitute a significant load on the sewage treatment works;

(d) Unusual volume of flow or concentration of wastes constituting a "slug" as defined herein;

(10) Waters or wastes containing substances which are not amenable to treatment by the sewage treatment plant, including, but not limited to, bromine, iodine, or chlorine, which cannot meet the requirements of other agencies having jurisdiction over discharge to the receiving waters. (Ord. 568, 2013; Ord. 550 § 2, 2012)

13.70.530 Authorization by superintendent to permit pretreatment or equalization.

(1) If any waters or wastes are discharged, or are proposed to be discharged, to the public sewers, which waters contain the substances or possess the characteristics enumerated in CMC 13.70.510, and which in the judgment of the superintendent may have a deleterious effect upon the sewage works, processes, equipment, or receiving waters, or which otherwise create a hazard to life or constitute a public nuisance, the superintendent may:

(a) Reject the wastes;

(b) Require pretreatment to an acceptable condition for discharge to the public sewers;

(c) Require control over the quantities and rates of discharge; and/or

(d) Require payment to cover the added cost of handling and treating the wastes not covered by existing taxes or sewer charges under the provisions of CMC 13.70.590.

(2) If the superintendent permits the pretreatment or equalization of waste flows, the design and installation of the plants and equipment shall be subject to the review and approval of the superintendent, and subject to the requirements of all applicable codes, ordinances and laws. (Ord. 550 § 2, 2012)

13.70.540 Grease, oil, and sand interceptors.

Grease, oil, and sand interceptors shall be provided when, in the opinion of the superintendent, they are necessary for the proper handling of liquid wastes containing grease in excessive amounts, or any flammable wastes, sand, or other harmful ingredients; except that such interceptors shall not be required for private living quarters or dwelling units. All interceptors shall be of a type and capacity approved by the superintendent, and shall be located as to be readily and easily accessible for cleaning and inspection. (Ord. 550 § 2, 2012)

13.70.550 Maintenance of preliminary treatment or flow-equalizing facilities.

Where preliminary treatment or flow-equalizing facilities are provided for any waters or wastes, they shall be maintained continuously in satisfactory and effective operation by the owner at his expense. (Ord. 550 § 2, 2012)

13.70.560 Control manholes.

When required by the superintendent, the owner of any property serviced by a building sewer carrying industrial wastes shall install a suitable control manhole together with such necessary meters and other appurtenances in the building sewer to facilitate observation, sampling and measurement of the wastes. Such manhole, when required, shall be accessible and safely located, and shall be constructed in accordance with the plans approved by superintendent. The manhole shall be installed by the owner at his expense, and shall be maintained by him so as to be safe and accessible at all times. (Ord. 550 § 2, 2012)

Article VI. Industrial Cost Recovery

13.70.580 Measurements, tests and analyses – Determination site.

All measurements, tests and analyses of the characteristics of waters and wastes to which reference is made in this chapter shall be determined in accordance with the latest edition of "Standard Methods for the Examination of Water and Wastewater," published by the American Public Health Association, and shall be determined at the control manhole provided, or upon suitable samples taken at said control manhole. In the event that no special manhole has been required, the control manhole shall be considered the nearest downstream manhole in the public sewer to the point at which the building sewer is connected. Sampling shall be carried out by customarily accepted methods to reflect the effect of constituents upon the sewage works and to determine the existence of hazards to life, limb, and property. (Ord. 550 § 2, 2012)

13.70.590 Treatment of industrial waste of unusual strength or character.

No statement contained in this article shall be construed as preventing any special arrangement between the town and any industrial concern whereby an industrial waste of unusual strength or character may be accepted by the town for treatment, subject to payment therefor, by the industrial concern. (Ord. 550 § 2, 2012)

13.70.600 Applicability.

The requirements of this article apply only to those features of wastewater treatment and transportation facilities which have been constructed with federal assistance administered by the U.S. Environmental Protection Agency under PL-500 (33 USC Chapter 26). (Ord. 550 § 2, 2012)

Article VII. Protection from Damage

13.70.610 Violation – Penalty.

No unauthorized person shall maliciously, willfully, or negligently break, damage, destroy, uncover, deface, or tamper with any structure, appurtenance, or equipment which is a part of the sewage works. Any person violating this provision, upon conviction thereof, is guilty of a misdemeanor, and shall be punished by a fine not to exceed

$1,000, or by imprisonment in the county jail not to exceed 90 days, or both such fine and imprisonment. (Ord. 649 § 4, 2021; Ord. 550 § 2, 2012)

Article VIII. Powers and Authority of Inspectors

13.70.620 Right of entry.

The superintendent and other duly authorized employees of the town bearing proper credentials and identification shall request the consent to enter the premises for the purposes of inspection, observation, measurement, sampling, and testing in accordance with the provisions of this chapter. If consent to enter is denied, then the town shall seek a judicial warrant to enter the premises, unless a public safety emergency justifies warrantless entry. The superintendent or his representatives shall have no authority to inquire into any processes including metallurgical, chemical, oil, refining, ceramic, paper, or other industries beyond that point having a direct bearing on the kind and source of discharge to the sewers or waterways or facilities for waste treatment. (Ord. 649 § 5, 2021; Ord. 550 § 2, 2012)

13.70.630 Observation of safety rules required – Responsibility for loss or damages.

While performing the necessary work on private properties referred to in CMC 13.70.640, the superintendent or duly authorized employee of the town shall observe all safety rules applicable to the premises established by the company. The town shall be held harmless for injury or death to the town employees and the town shall indemnify the company against loss or damage to its property by town employees and against liability claims and demands for personal injury or property damage asserted against the company and growing out of the gauging and sampling operation, except as such may be caused by negligence or failure of the company to maintain safe conditions as required in CMC 13.70.560. (Ord. 550 § 2, 2012)

13.70.640 Private property easement access.

The superintendent and other duly authorized employees of the town bearing proper credentials and identification shall be permitted to enter all private properties through which the town holds a duly negotiated easement for the purposes of, but not limited to, inspection, observation, measuring, sampling, repair, and maintenance of any portion of the sewage works lying within said easement. All entry and subsequent work, if any, on said easement shall be done in full accordance with the terms of the duly negotiated easement pertaining to the private property involved. (Ord. 550 § 2, 2012)

Article IX. Penalties

13.70.650 Violation – Notice – Correction time limit.

Any person found to be violating any provision of this chapter except CMC 13.70.610 as set out in Article VII of this chapter shall be served by the town with written notice stating the nature of the violation and providing a reasonable time limit for the satisfactory correction thereof. The offender shall, within the period of time stated in such notice, permanently cease all violations. (Ord. 550 § 2, 2012)

13.70.660 Continued violation – Misdemeanor – Penalty.

Any person who shall continue any violation beyond the time limit provided for in CMC 13.70.650 shall be guilty of a misdemeanor and on conviction thereof shall be fined in the amount not exceeding $1,000 for each violation. Each day in which any such violation shall continue shall be deemed a separate offense. (Ord. 550 § 2, 2012)

13.70.680 Violation – Liability responsibility.

Any person violating any of the provisions of this chapter shall become liable to the town for any expense, loss or damage occasioned the town by reason of such violation, including a reasonable attorney's fee in the event that civil litigation should become necessary to enforce the provisions of this chapter. (Ord. 550 § 2, 2012)

Article X. Appeals

13.70.700 Appeal procedure.

Any person having been denied a permit hereunder or any person otherwise feeling aggrieved by any action of the superintendent in his administration or enforcement of the terms of this chapter may appeal said decision by the following procedure:

(1) By giving written request to the council of the town of Cathlamet for a hearing on said appeal. This written request shall be filed with the clerk of the town of Cathlamet;

(2) The council of the town of Cathlamet shall give notice in writing not less that 10 days prior to such hearing to the appealing person of the date, time, place and purpose of the hearing;

(3) The council of the town of Cathlamet shall, after the receipt of said written request, meet to hear said complaint and shall record its findings upon such complaint within its minutes. The determination of the council shall be final. (Ord. 550 § 2, 2012)

Chapter 13.75

SEWER DEVELOPMENT FEES FOR COUNTY-FINANCED DEVELOPMENT

Sections:

13.75.010 Purpose.

(1) The purpose of this chapter is to define the rules and regulations that will enable the town to assess and collect sewer development fees for facilities constructed at the expense of Wahkiakum County.

(2) For the purpose of this chapter, "sewer facilities" shall have the meaning specified in RCW 35.91.020 as it now reads or is hereafter amended. (Ord. 550 § 2, 2012)

13.75.020 Interlocal agreement.

(1) Pursuant to the terms of any interlocal agreement between the county of Wahkiakum and the town of Cathlamet, sewer trunk/interceptor lines may be constructed in the county of Wahkiakum with such facilities to become a part of the town sewer system.

(2) Pursuant to said agreement, the town may contract for the payment to the town of any or all costs of such sewer trunk/interceptor lines as a condition of the town's acceptance of said lines.

(3) Said agreement shall provide for the determination of the sewer service area to be served by the sewer trunk/ interceptor lines.

(4) System development fees shall be collected for the benefit of the county of Wahkiakum and shall be in addition to any and all connection fees, charges, assessments, levies or deposits required by the town. (Ord. 550 § 2, 2012)

13.75.030 Sewer service area fees.

(1) The town of Cathlamet shall collect and retain all sewer connection fees, charges, assessments, levies or deposits as established under CMC 13.10.060, and all monthly sewer user fees as established by town ordinance for out-of-town services, or otherwise.

(2) In addition to the town's sewer connection fees and related charges, the town of Cathlamet shall collect and remit to the county of Wahkiakum at the time of sewer connection a system development fee of $3,000 per equivalent customer unit in such service area, or such other amount as may be agreed in an interlocal agreement for construction of sewer trunk/interceptor lines. (Ord. 550 § 2, 2012)

13.75.040 Boege Road service area and other service areas.

(1) There is hereby created the Boege Road service area described as follows:

> Sewer service Area 24 as described in figure F-2 of the General Wastewater Facilities Plan dated January, 2003, and more particularly described as follows:
>
> That portion of Sections 1 and 12, Township 8 North, Range 6 West of the Willamette Meridian, Wahkiakum County, Washington, described as follows:
>
> BEGINNING at the Southeast corner of Section 1; THENCE Northwesterly to the Northeast corner of the Southwest quarter of the Southeast Quarter, of said Section 1; THENCE continuing Northwesterly to the Northeast corner of the Southwest quarter of said Section 1; THENCE West to the Northwest corner of the East half of the Southwest quarter of said Section 1; THENCE South along the West line of said East half and its extension to its intersection with State Highway S.R. 4; THENCE Southeasterly along the centerline of said S.R. 4, and being within said Section 12, to its intersection with Fern Hill Road; THENCE Easterly along the centerline of said Fern Hill Road to its intersection with the East line of said Section 12; THENCE North along the East line of said Section 12 to the Northeast corner of said Section 12, also being the Southeast corner of said Section 1, and the POINT OF BEGINNING.

(2) Additional service areas may be created from time to time pursuant to interlocal agreement between the town and county, and to which this chapter shall apply. (Ord. 550 § 2, 2012)

13.75.050 Contract time period.

All contracts entered into pursuant to this chapter shall provide for a period of 15 years or more for the reimbursement of sewer facilities costs. (Ord. 550 § 2, 2012)

13.75.060 Collection and disbursement of fees.

(1) No person, firm, or corporation shall be granted a permit or be authorized to tap into or use any sewer facilities or extensions thereof in the described service area during the period of time prescribed in such interlocal agreement without first paying to the town, in addition to all other costs and charges made or assessed for such tap, or use, or for the sewers constructed in connection therewith, the amount required by the provisions of the interlocal agreement under which the sewer facilities so tapped into or used were constructed.

(2) The town clerk-treasurer shall be the responsible town official for the collection and disbursement of system development fees.

(3) All system development fees collected shall be disbursed under the terms and conditions of each interlocal agreement within 60 days after their receipt. (Ord. 550 § 2, 2012)

13.75.070 Charging of town sewer rates.

Upon approval and acceptance of sewer facilities, the town clerk-treasurer shall charge such sewer rates authorized by town sewer ordinance. (Ord. 550 § 2, 2012)

Chapter 13.80
OPERATION AND MAINTENANCE OF SEWAGE TREATMENT WORKS

Sections:

Article I. Definitions

13.80.010 Generally.

Unless the context specifically indicates otherwise, the meaning of terms used in this chapter shall be as set forth in this article. (Ord. 550 § 2, 2012)

13.80.011 Accessory dwelling unit.

“Accessory dwelling unit” shall mean a subordinate dwelling unit added to, created within, or detached from a single-family structure with a separate entrance that provides basic requirements for living, sleeping, eating, cooking, and sanitation. (Ord. 595, 2017)

13.80.020 Apartment house.

“Apartment house” shall mean any building, or portion thereof, which is designed, built, rented, leased, let or hired out to be occupied, or which is occupied, as the home or residence of three or more families living independently of each other and doing their own cooking in the said building. (Ord. 550 § 2, 2012)

13.80.030 Duplex.

“Duplex” shall mean a building, which is located on one legal lot or parcel, containing two dwelling units designed exclusively for occupancy by two single households living independently of one another and sharing a common wall. A single-family dwelling containing an accessory dwelling unit shall not be interpreted as a duplex. (Ord. 595, 2017)

13.80.040 Dwelling unit.

"Dwelling unit" shall mean a single unit providing complete, independent living facilities for one or more persons, including permanent provisions for living, sleeping, eating, cooking and sanitation. (Ord. 550 § 2, 2012)

13.80.050 Equivalent customer unit.

"Equivalent customer unit" shall mean a unit of wastewater which, based upon standardized formulas and engineering analysis, incurs the same costs for operation and maintenance of a sewage treatment facility as does the discharge of domestic waste from a normal single-family residence. (Ord. 550 § 2, 2012)

13.80.060 Hotel.

"Hotel" shall mean any building containing three or more guest rooms intended or designed to be used, or which are used, rented or hired out to be occupied, or which are occupied, for sleeping purposes by guests. (Ord. 550 § 2, 2012)

13.80.061 Multiple-family residence.

"Multiple-family residence" shall mean a building or portion thereof designed or used as a residence by two or more families and containing two or more dwelling units, any one of which may be an accessory dwelling unit occupied by the owner of the property or by a family member related to the property owner by blood, marriage, or adoption, including foster children, but only if the primary dwelling and accessory dwelling are both occupied by the property owner and/or family member. (Ord. 595, 2017)

13.80.062 Single-family residence.

"Single-family residence" shall mean a building designed or used for residential purposes by not more than one family and containing one dwelling unit only, and shall include an accessory dwelling unit not deemed to be part of a multiple-family residence under CMC 13.80.061. (Ord. 595, 2017)

13.80.070 Industrial user.

"Industrial user" shall mean any nongovernmental user of the public treatment works identified in the Standards Industrial Classification Manual, 1972, United States Office of Management and Budget, as amended and supplemented, under the following divisions:

(1) Division A: Agriculture, Forestry and Fishing;

(2) Division B: Mining;

(3) Division D: Manufacturing;

(4) Division E: Transportation, Communications, Electric, Gas and Sanitary Services;

(5) Division I: Services.

A user in these divisions may be excluded from the industrial category if it is determined that it will introduce primarily domestic wastes and wastes from sanitary conveniences. (Ord. 550 § 2, 2012)

13.80.080 Shall and may.

“Shall” is mandatory; “may” is permissible. (Ord. 550 § 2, 2012)

13.80.090 Superintendent.

“Superintendent” shall mean the public works superintendent of the town of Cathlamet or his designee. (Ord. 550 § 2, 2012)

13.80.100 User.

“User” shall mean every person or entity using any part of the public sewerage system of the town of Cathlamet. (Ord. 550 § 2, 2012)

13.80.110 User charge.

“User charge” shall mean the periodic charges levied on all users of the public sewerage system, and shall, at a minimum, cover each user’s proportionate share of the cost of operation and maintenance of said sewerage system. (Ord. 550 § 2, 2012)

Article II. Sewer User Charges

13.80.120 Equivalent customer units established.

For the purpose of assessing equitable user charges to each user of the public sewerage system of the town of Cathlamet, the following “equivalent customer units” are hereby established for the following user classes:

User Class	**Equivalent Customer Units**
(1) Single-family residence	1.0
(2) Multiple-family residence, duplex, apartment house, trailer court	1.0 + 0.7 per each additional dwelling unit
(3) Hotel, motel	1.0 + 0.4 per rental unit, up to a maximum of 5.0
(4) Recreational vehicle parks	1.0 + 0.4 per rental unit (pad)
(5) Schools:	
(a) Elementary (including old gymnasium)	1.0 per 25 students
(b) High school	1.0 per 15 students
(6) Other public facilities:	
(a) Town park	1.0
(b) Elochoman Marina Main Account	5.0
(c) Swimming pool	3.0
(d) Courthouse	6.0
(e) P.U.D.	2.0
(f) Town Hall	2.0
(7) Commercial:	

User Class	Equivalent Customer Units
(a) Small shop, store, or business establishment	1.0
(b) Supermarkets, grocery stores	2.0
(c) Restaurant (with inside seating)	2.0
(d) Drive-in (no inside seating)	2.0
(e) Tavern	2.0
(f) Coin laundry	0.7 per washing machine, up to a maximum of 5.0
(g) Professional office	1.0
(h) Nursing home	2.0 + 0.4 per bed, up to a maximum of 5.0
(8) Churches, service organizations, meeting halls	1.0

In the event there is any conflict between the provisions of this section and any other provision of the Cathlamet Municipal Code, the other provision shall prevail. (Ord. 602, 2017; Ord. 595, 2017; Ord. 563, 2013)

13.80.130 Special users.

Any industrial user or any other user which cannot be classified in any of the user classes set forth in CMC 13.80.120 shall be considered a special user. Such user shall be placed in an open class and a special charge based on both volume and strength of waste shall be assigned to that user by the superintendent subject to the approval of the council. (Ord. 550 § 2, 2012)

13.80.131 Excess EDU surcharge for special user discharges.

Special users whose discharges exceed 0.28 pound of biochemical oxygen demand per EDU per day, or exceed 0.30 pound of total suspended solids per EDU per day, shall be subject to a surcharge calculated at the town's established rate per EDU or fraction thereof. (Ord. 568, 2013)

13.80.140 User charge within boundaries of LID No. 13.

The monthly user charge for each user located within the boundaries of Local Improvement District No. 13 of the town of Cathlamet as established by Ordinance No. 280 shall be consistent with the rates established by this chapter. (Ord. 550 § 2, 2012)

13.80.150 User charge outside boundaries of LID No. 13.

The monthly user charge for each user located outside the boundaries of Local Improvement District No. 13 of the town of Cathlamet as established by Ordinance No. 280 shall be consistent with the rates established by this chapter. (Ord. 550 § 2, 2012)

13.80.160 Commencement of charges for occupied and unoccupied property.

The sewer user charge for all occupied property shall begin 90 days after the sewer service becomes available or the day that connection is made to the public sewer, whichever occurs first. The sewer user charge for all unoccupied property shall begin within 30 days after the property is ready for occupancy or on the first day of occupancy, whichever occurs first. All unoccupied property which is ready for occupancy at the time the sewer service becomes available shall be treated as occupied property. Once the sewer user charge has commenced, no credit shall be given for vacancy; provided, however, that the sewer user charge may be reduced to 1.0 equivalent customer unit; provided, that:

(1) The customer requests in writing that the user charge be reduced to such minimum after certifying that the property is unoccupied and that the customer will notify the town when the property again becomes occupied;

(2) The account is paid current to the first of the month following the town's receipt of such written request before the user charge will be reduced; and

(3) That the sewer user charge will be increased to the appropriate number of equivalent customer units on the first day of the month during which the property again becomes occupied. (Ord. 563, 2013)

13.80.170 Charges for single user having more than one classification of use.

(1) A single user having more than one classification of use shall be charged the sum of the charges for those classifications.

(2) Notwithstanding subsection (1) of this section, a single-family residence single user having more than one classification of use within their residence shall only be charged the “equivalent customer units” for the highest user class.

(3) No single user having more than one classification of use shall be charged more than 5.0 equivalent customer units. (Ord. 563, 2013; Ord. 550 § 2, 2012)

13.80.180 Review of user charge.

Should any user believe that he has been incorrectly assigned to a particular user class or incorrectly assigned a number of equivalent customer units, that user may apply for review of his user charge as provided in Article VI of this chapter. (Ord. 550 § 2, 2012)

13.80.190 Determination of incorrect assignment of user class – Reassignment.

Should the superintendent determine that a user is incorrectly assigned to a user class or incorrectly assigned a number of equivalent customer units, he shall reassign a more appropriate user class or number of equivalent customer units to that user and shall notify that user of such reassignment. The superintendent shall apply such criteria of the Washington Department of Ecology, the U.S. Environmental Protection Agency, and all other laws and rules that may properly apply. The superintendent may apply such engineering and technical standards as are consistent with governing laws and regulations. (Ord. 550 § 2, 2012)

13.80.200 Recordkeeping.

Records of all assigned user classes and all assigned rates as well as the wastewater characteristics forming the basis of the equivalent customer unit shall be kept on file at the Town Hall office and shall be open for public inspection. (Ord. 550 § 2, 2012)

Article III. Review and Revision of Rates

13.80.210 Annual review of sewer user charges.

The sewer user charges established in Article II of this chapter shall, at a minimum, be reviewed annually and revised periodically to reflect actual costs of operation, maintenance, replacement and financing of the municipal sewerage system and to maintain the equitability of the user charges with respect to proportional distribution of the costs of operation and maintenance in proportion to each user's contribution to the total wastewater loading of the sewerage system. (Ord. 550 § 2, 2012)

13.80.220 Reviewing authority – Date established.

User classes and equivalent customer unit computations shall be reviewed by the superintendent annually and shall be established as of January 1st of each calendar year. (Ord. 550 § 2, 2012)

Article IV. Responsibility, Payment Delinquencies and Penalties

13.80.230 Owner responsible for payment.

The person who owns the premises served by the sewerage system shall be responsible for payment of the sewer user charge for that property notwithstanding the fact that the property may be occupied by a tenant or other occupant who may be required by the owner to pay said charges. Only one bill per building sewer connected to the municipal sewerage system shall be prepared and issued by the town. (Ord. 550 § 2, 2012)

13.80.240 Billing schedule.

The users of the sewerage system shall be billed on a monthly basis for services rendered in accordance with the rate schedule as set forth in Article II of this chapter. (Ord. 550 § 2, 2012)

13.80.250 Due date – Delinquency.

Sewer user charges shall be due and payable in full on the fifth day of the month approximately one month after the closing date reflected on the billing. (For example, whether the closing date is January 31st or February 3rd, charges are due March 5th.) If the fifth falls on a weekend or a legal holiday recognized by the town, charges are due and payable the following business day. Sewer user charges shall be delinquent if not paid by such date. (Ord. 598 § 2, 2017)

13.80.260 Recovery of debt by civil action.

Sewer user charges levied in accordance with this chapter shall be a debt due to the town and a lien upon the property served. If this debt is not paid prior to delinquency as defined in CMC 13.80.250, it may be recovered by civil action in the name of the town against the property owner, the user, or both. (Ord. 550 § 2, 2012)

13.80.270 Delinquent payment penalty.

In the event that sewer user charges are not paid prior to delinquency as defined in CMC 13.80.250, a penalty shall be assessed at the rate of $10.00 per month from the date of delinquency which shall be added to the user's account. (Ord. 550 § 2, 2012)

13.80.280 Sewer connection closure due to delinquency – Closure and restoration expense responsibility.

After a two-month delinquent period, the occupant or occupants of the affected premises shall be given a 24-hour notice after which the town shall have the right to remove or close sewer connections. The superintendent and other duly authorized employees of the town bearing proper credentials and identification shall request the consent to enter the premises for accomplishing such purposes in accordance with the provisions of this chapter. If consent to enter is denied, then the town shall seek a judicial warrant to enter the premises, unless a public safety emergency justifies warrantless entry. The expense of such discontinuance, removal, or closing, as well as the expense of restoring service, shall be a debt due to the town and a lien upon the property and may be recovered by civil action in the name of the town against the property owner, the user, or both. (Ord. 649 § 6, 2021; Ord. 550 § 2, 2012)

13.80.290 Restoration conditions.

Sewer service shall not be restored until all charges, including the expense of removal, closing, and restoration, shall have been paid. (Ord. 550 § 2, 2012)

13.80.300 Additional and concurrent methods of enforcing liens.

As an additional and concurrent method of enforcing the lien authorized by this chapter and Chapter 35.67 RCW, the town may elect to enforce said lien by cutting off the water service from the premises to which sewer service was furnished after the sewer charges become delinquent and unpaid as defined by this article. (Ord. 550 § 2, 2012)

13.80.310 Change of ownership or occupancy no remedy to penalties.

Change of ownership or occupancy of premises found delinquent shall not be cause for reducing or eliminating the penalties set forth in this article. (Ord. 550 § 2, 2012)

Article V. Permit Fees, Connection Charges, Systems Development Fees and Standards for Sewer Extensions

13.80.320 Building sewer permit fee.

The fee for the building sewer permit required by virtue of CMC 13.70.300 shall be the sum of $25.00 payable upon submission of the building sewer permit application to the superintendent. (Ord. 550 § 2, 2012)

13.80.330 Connection charge within boundaries of LID No. 13.

For all property located within the boundaries of Local Improvement District No. 13 of the town of Cathlamet as established by Ordinance No. 280, there shall be levied and collected a sewer connection charge as provided by CMC 13.10.060 per equivalent customer unit for the privilege of connecting a building sewer to the town's municipal sewerage system. This connection charge shall be payable at the time of making application for a building sewer permit. This connection charge shall not apply to property already connected to the town's municipal sewerage system on May 13, 1982. (Ord. 550 § 2, 2012)

13.80.340 Connection charge outside boundaries of LID No. 13.

For all property not located within the boundaries of Local Improvement District No. 13 of the town of Cathlamet as established by Ordinance No. 280, no person shall hereafter be allowed to connect any sewer lines to the municipal sewerage system of the town of Cathlamet without first making application to the town of Cathlamet and without at the time of such application paying to the town clerk-treasurer a systems development fee as provided by CMC 13.10.060 per equivalent customer unit. (Ord. 550 § 2, 2012)

13.80.350 Connection approval or denial.

Upon receipt of an application for sewer connection made pursuant to CMC 13.70.340, the superintendent shall conduct an investigation to determine whether the applicant has complied with the requirements set forth in this article. Within 60 days of the receipt of such application, the superintendent shall submit a report to the council and such report shall include a recommendation as to whether or not the superintendent believes that the proposed connection would be in the best interests of the sewerage utility of the town of Cathlamet. Upon the receipt of said report, the council shall schedule a hearing after which the council will determine whether the application for connection to the municipal sewerage system should be granted or denied. The applicant shall be given at least five days' notice prior to any such hearing. If the application is denied, the systems development fee shall be refunded to the applicant. (Ord. 550 § 2, 2012)

13.80.360 Denial for good cause.

The town may deny any application made under CMC 13.70.340 for good cause. Good cause includes, but is not limited to: (1) a finding by the town council that the applicant's sewerage system does not meet the minimum construction requirements established by the superintendent and the Uniform Plumbing Code, 1982, and supplements thereto; (2) a finding by the town council that the applicant is not willing or able to turn ownership of any privately constructed trunk or collector sewers over to the town; (3) a finding by the town council that the applicant is unable or unwilling to comply with the provision of CMC 13.70.370; (4) a finding by the town council that further extensions of the municipal sewerage system would jeopardize the ability of the system to adequately serve then existing users. (Ord. 550 § 2, 2012)

13.80.370 Conditional acceptance by town of sewer systems constructed by private developers.

The town may accept for ownership, operation and maintenance sewer systems constructed by private developers or other private persons; provided, that all of the following conditions are met:

(1) A preliminary engineering report and final construction plans and specifications shall be prepared by a professional civil engineer licensed in the state of Washington. These documents shall be prepared in accordance with the rules and regulations of and meet the approval of the State Department of Health and the State Department of Ecology. This report shall include costs of construction and operation and maintenance costs.

(2) The design of the system or systems shall be in harmony with any existing town general water and/or sewer plan for the area in which the system or systems are proposed.

(3) The engineering report and final plans must be approved by the town prior to any construction.

(4) The developer shall, prior to construction, enter into an agreement wherein deeds, easements, rights-of-way, licenses and permits required by the town to operate and maintain the system will be provided by the developer, at his expense, as a condition of acceptance by the town.

(5) All construction work must be inspected by a licensed professional engineer or his designated inspector and acknowledgment of acceptance of all work must be accompanied by said engineer's seal. However, the town reserves the right to inspect any and all portions of the job at the discretion of the superintendent. Any plan or specification changes must be approved by the state of Washington and the superintendent.

(6) The town will require a one-year maintenance bond on all sewer systems accepted by the town to insure the correction of any faulty equipment or construction. Such maintenance bond will in no way waive the manufacturer's warranty.

(7) One copy plus one reproducible copy of the "as-built" sewer plans shall be submitted to the superintendent.

(8) The town will not accept the liability for or the ownership of any sewer system in any other manner than by a resolution passed by the town council. (Ord. 550 § 2, 2012)

Article VI. Appeals

13.80.380 Request for review of user charge.

Any sewer user who feels his sewer user charge is unjust and inequitable as applied to his premises within the intent of the foregoing provisions of this chapter may make written application to the town council requesting a review of his user charge. Said written request shall, where necessary, show the actual or estimated average flow of his wastewater in comparison with the values upon which the charge is based, including how the measurements or estimates were made. (Ord. 550 § 2, 2012)

13.80.390 Review – Substantiation determination.

Review of the request shall be made by the town council after consultation with the superintendent. The council shall determine whether the request is substantiated or not. If the council determines that further information is necessary in order to fairly evaluate the request, the council may, prior to making its determination, refer the matter to the superintendent or a registered professional engineer for further study. (Ord. 550 § 2, 2012)

13.80.400 Revised data approval – Recomputation of charges.

If the request is determined by the council to be substantiated, the user charges for that user shall be recomputed based upon the approved revised data and the new charges thus recomputed shall be applicable retroactively up to six months, as applicable under the circumstances. (Ord. 550 § 2, 2012)

Chapter 13.85
NONRENEWAL OF INTERLOCAL WATER SUPPLY CONTRACT

(Repealed by Ord. 580)

Chapter 13.90
WATER AND SEWER RESERVE FUNDS

Sections:

13.90.010 Water and sewer reserve funds.

(1) The town council shall direct the establishment and maintenance of separate and distinct utility reserve accounts to accumulate utility revenues for the purpose of financing long-term system repairs, upgrades, revisions, replacements, and extensions as follows:

(a) Water Cumulative Reserve Fund 402;

(b) Sewer Cumulative Reserve Fund 403; and

(c) Such other utility accounts as the council may direct by ordinance.

(2) The town council may authorize transfers of funds from one utility reserve account to another utility reserve account, or to an ongoing utility operating expense account, by amendment to the town's annual budget ordinance under the following conditions:

(a) Upon declaration of an emergency by the mayor or the council;

(b) When required by operation of law;

(c) When the town council determines the transfer is necessary for the public safety, proper utility operations, or economic integrity of the town. (Ord. 550 § 2, 2012)

Chapter 13.95
WATER AND SEWER RATES

Sections:

Prior legislation: Ord. 622.

13.95.010 Water rates within town corporate limits.

Water rates within town corporate limits are established as follows:

(1) *Monthly Minimum Charge.*

Meter Size	Basic Charge (from 0 to 350 cubic feet/month)
5/8 inch	$38.76
3/4 inch	$45.85
1 inch	$61.45
1-1/2 inch	$81.68
2 inch	$104.41
3 inch	$138.57
4 inch	$181.49
> 4 inch	Established by contract with the town of Cathlamet

(2) Supplemental Volume Charge (in excess of 350 cubic feet/month). Per 100 cubic feet or part thereof per month: $2.65. (Res. 399 § 1, 2020; Res. 374 § 1, 2019)

13.95.020 Water rates outside town corporate limits.

Water rates outside town corporate limits are established as follows:

(1) *Monthly Minimum Charge.*

Meter Size	Basic Charge (from 0 to 350 cubic feet/month)
5/8 inch	$56.87

Meter Size	Basic Charge (from 0 to 350 cubic feet/month)
3/4 inch	$70.97
1 inch	$88.96
1-1/2 inch	$117.52
2 inch	$149.61
3 inch	$196.45
4 inch	$258.38
> 4 inch	Established by contract with the town of Cathlamet

(2) Supplemental Volume Charge (in excess of 350 cubic feet/month). Per 100 cubic feet or part thereof per month: $3.55. (Res. 399 § 2, 2020; Res. 374 § 2, 2019)

13.95.030 Sewer rates within town corporate limits.

Sewer rates within town corporate limits: $106.48 per month. (Res. 399 § 3, 2020; Res. 374 § 3, 2019)

13.95.040 Sewer rates outside town corporate limits.

Sewer rates outside town corporate limits: $123.78 per month. (Res. 399 § 4, 2020; Res. 374 § 4, 2019)

13.95.045 Commercial/multiresidential.

Commercial and multiresidential users are billed based on the equivalent customer units established in CMC 13.80.120. (Ord. 550 § 2, 2012)

13.95.050 Sewer reserve account deposits.

The clerk-treasurer shall deposit a portion of sewer service charges collected pursuant to CMC 13.95.030 and 13.95.040 into the town's Sewer Cumulative Reserve Fund on the following basis: $60.00 per month. (Ord. 591 § 1, 2017; Ord. 588 § 5, 2016; Ord. 550 § 2, 2012)

The Cathlamet Municipal Code is current through Resolution 417, and legislation passed through March 21, 2022.

Disclaimer: The town hall has the official version of the Cathlamet Municipal Code. Users should contact the town hall for ordinances passed subsequent to the ordinance cited above.

Town Website: www.townofcathlamet.com
Town Telephone: (360) 795-3203
Code Publishing Company

Town of Cathlamet
375 2nd Street, Cathlamet, WA 98612
Tel: 360.795.3203 – Fax: 360.795.8500
Email: accounting@townofcathlamet.com
Website: www.townofcathlamet.com

UTILITY SERVICE APPLICATION

(CMC Title 13)

CUSTOMER INFORMATION:

☐ **OWNER,** CMC 13.15.005: Property/Land Owner ☐ **TENANT,** CMC 13.15.040: Landlord/Tenant

LAST NAME: ____________________ **FIRST NAME:** ____________________
SERVICE ADDRESS: ____________________ **CITY/STATE/ZIP:** ____________________
ACQUISITION DATE: ____________________ **EXISTING ACCT. #:** ____________________
MAILING ADDRESS: ____________________ **CITY/STATE/ZIP:** ____________________
PHONE NO.: ____________________ **EMAIL ADDRESS:** ____________________
ALT. CONTACT ____________________ **ALT. PHONE NO.:** ____________________

If you are a tenant or not the property/landowner, please include the owner's information below; it is the Town's policy to issue duplicate copies of tenant bills and late notices to landlords/owners:

OWNER'S NAME: ____________________ **OWNER'S PHONE:** ____________________

SERVICE & FEE INFORMATION:

Please check one box in each category if the section applies.

Service Type:	Refundable Deposit:	Additional Fees:	
☐ Water Only ☐ Sewer Only ☐ Water & Sewer ☐ Unsure? → *Please call us!*	☐ Water Only $100 ☐ Sewer Only $100 ☐ Water & Sewer $200	☐ Turn-On Service $30 ☐ N/A, *my service is on.* Total Fees Due: $_______	*All fees, including delinquent balances, deposits and turn-on fees must be paid prior to establishing service. Additional fees may be applicable upon Town review during setup.*

Deposits are refundable after 1-year of no late payments and will be applied as a credit to your account. Utility bills are due in full on the 5th day of each month. Water service may be terminated when any portion of the utility bill is unpaid and delinquent. A $30 late fee will be charged for any portion of late payments. CMC 13.15.

PLEASE REVIEW THE CATHLAMET MUNICIPAL CODE (CMC) TITLE 13 – PUBLIC UTILITIES FOR THE REGULATIONS GOVERNING WATER/SEWER SERVICE AND CONNECTIONS.

Questions? Contact Town Hall by email or phone during regular business hours: M-TH 8:30am-4:30pm (Closed 12:30-1pm)

I certify under penalty of perjury under the laws of the State of Washington that the foregoing is true and correct (RCW9A.72.085). In making this application I affirm that I am the owner or duly authorized tenant of said owner and hereby certify that I have been advised to read CMC Title 13 for the regulations governing water/sewer usage, rates, and connections. I understand that the property owner is fully responsible for all utility bills or claims against the property located at the above address and the owner may be sent duplicate copies of any utility bills and late notices. The undersigned understands that continuation of water/sewer service is contingent upon compliance with applicable Town codes. Failure to comply with the applicable codes will authorize the Town to discontinue water and/or sewer service.

Applicants Signature: ______________________________ ***Date:*** ____________________

TOWN OF CATHLAMET WATER & SEWER UTILITY SERVICE TERMS, CONDITIONS, & POLICIES

New Accounts:

CMC 13.15.005	Utility deposits are payable prior to establishing service, as follows: $200 for water and sewer accounts and $100 for water only or sewer only accounts.
CMC 13.15.030	All utility bills are due and payable in full on the fifth day of the month approximately one month after the closing date reflected on the billing. If the fifth falls on a weekend or a legal holiday recognized by the town, charges are due and payable the following business day. If payment is not received in a timely manner, the unpaid bill shall become delinquent and a termination notice shall be given, informing the customer that termination of service shall occur no sooner than 10 days from the date of mailing of the notice of termination of service. Water service may be terminated when any portion of the utility bill is unpaid and delinquent. A $30 late charge shall be levied against any customer who becomes delinquent.
CMC 13.15.030	The Town will issue a duplicate copy of all tenant utility bills and late notices to their landlords/property owners.
CMC 13.95	Each water customer pays a monthly base charge and a volume charge, based on the amount of water used in a billing period. The minimum charge for water service is based on the meter size installed for your property and includes up to 350 cubic feet/month. All volume charges are computed per hundred cubic feet or CCF. (1 CCF = 100 cubic feet or 748 gallons.)
CMC 13.80.120	Your base sewer fee may be more than the minimum monthly fee, based on 1.0 ECU, listed in CMC 13.95 if your property is not a "single-family residence". Sewer Equivalent Customer Units (ECU) are set forth in CMC 13.80.120.
CMC 13.10.065	In addition to water and sewer charges imposed herein, there is added to the water and sewer bill of each customer in town or outside town a 6% utility tax imposed under Chapter 3.85 CMC and is included in the total billed amounts.
CMC 13.15.050	Water & Sewer charges continue to accrue on a monthly basis even after water has been shut off; A $30 shut-off fee applies to turn off your service to prevent usage and usage fees from accruing; and a $30 turn-on fee will apply to restore flow; Sewer charges will continue even if the water service has been terminated and are subject to a $30.00 late fee.
CMC 13.10.040	If an active utility account is not kept current under the Town's billing practicing for a period of one year, it shall be considered abandoned, and any system capacity attributed to such connection shall revert to the Town and all connection fees will be reapplied to reconnect.

New Connections:

CMC 13.35.100	The customer shall install, as close to the meter location as practicable, a suitable shut-off valve in his house connection to the meter that will shut off all service to his premises.
CMC 13.10.060	In-town customers pay a $3,000 system connection/hook-up fee for water and $3,000 for sewer for the rights to use our systems, prior to connection or scheduling of such; Out-of-town customers pay a $5,000 system connection/hook-up fee for water and $5,000 for sewer for the rights to use our systems, prior to connection or scheduling of such; *In addition to the system connection fees, all customers will pay the actual charges for the meter, fittings, materials and labor which will be invoiced after the installation and are due upon receipt.
CMC 13.75.030	Out-of-town sewer customers located on the "Boege Road Sewer Extension" are also required to pay a $3,000 connection fee pursuant to an Interlocal Agreement with Wahkiakum County ($8,000 total for sewer only.) Streets included on this extension, include: N. Jacobson, Boege Rd., Linquist Ln., Orchard Dr., Clover St., Cochran Dr., Sun Crest Ln., Randall Dr., Hill Crest Dr., Delores Dr., E St., Christa Vista Dr.)
CMC 13.25.040	A connection fee of $100.00 shall be levied and collected by the town for any new development, expansion of use, change of occupancy, or increase in meter size that is found to place additional demand on the town's water system pursuant to CMC 13.10.060.
CMC 13.10.040	Any connection to any utility governed by this title shall expire one year from the date of approval; or the application and fees must be reapplied.
CMC 13.15.005	Utility deposits are payable prior to installation, as follows: $200 for water and sewer accounts and $100 for water only or sewer only accounts.
CMC 13.15.050	Water service & billing will begin at the time the meter is installed, even if your home is not built yet; we recommend scheduling your installation date closer to the date you will need water access on the property. Water & Sewer charges continue to accrue on a monthly basis even after water has been shut off.
CMC 13.10.040	If an active utility account is not kept current under the Town's billing practicing for a period of one year, it shall be considered abandoned, and any system capacity attributed to such connection shall revert to the Town and all connection fees will be reapplied to reconnect.

****THIS LIST IS NOT ALL INCLUSIVE. PLEASE VISIT https://cathlamet.municipal.codes/ TITLE 13 FOR A FULL LIST OF REGULATIONS.**

APPENDIX G

CONSUMER CONFIDENCE REPORT

2020 Annual Drinking Water Quality Report

Owned & Operated by the Town of Cathlamet, Public Works Department

Message from Public Works: Every year your water provider is required to send out an annual report. A lot of the report is language required by regulation. 2020 was a year that many would like to forget. The emergence of the Covid-19 pandemic brought a massive, rapid change to nearly every aspect of life, from the way we go to work, get groceries, socialize, communicate, & go about even the most mundane tasks of day-to-day life. Through it all we stayed the course & even managed to get some things done. At a brief glimpse:

- 2020 brought change yet again to the staff that comprises Town Hall & the Public Works department: The Town hired three new staff members in 2020; Deputy Clerk Michelle Baughman & Utility Maintenance Workers David Florek & Troy Gorley.
- The Town completed a sizable water main replacement project along Columbia Street/East SR4.
- The water supply from the Elochoman River is adequate for our current & projected future demand. The water plant is functioning well. The water quality is very good.
- None of our samples were found to contain any excessive levels of any compound versus the stringent standards of the Federal or State governments.
- Thanks to help from citizens, we continue to find & fix leaks & this results in less water wasted after treatment. Thank you!
- Find or install a water shut-off at your home. Do this while the sun shines & you don't need it… Also, in an effort to help us be as efficient as we can, as a homeowner please take a moment to locate your meter box, check it periodically for possible leaks (Is my meter spinning? Is it dry out but your box is full of water?), & please help by keeping the box accessible to you & to Town staff by keeping the vegetation cut. This is greatly appreciated by all Public Works staff.

David McNally, Public Works Superintendent; david@townofcathlamet.com

This report is required to be provided to you by regulation. Some of the information is technical in nature. Your water comes from the Elochoman River & is treated at the Town's filtration plant there. Our water is distributed to consumers & businesses including the two smaller systems that buy all their water from us. We provide all the treated water to consumers in Cathlamet and, via our largest customer, the PUD, to Puget Island. We test the water on-site daily, monitor the plant & distribution system, & do specialty testing periodically as required to ensure water quality that complies with federal & state regulations. Not one of our tests showed results at levels that pose a health risk to consumers. If you ever have a concern about your water, contact Public Works at 360-795-8032x4.

As many of our residents likely observed, from May through August the Town completed a large water main improvement project to abandon a long stretch of 6" asbestos cement water main with new 8" C-900 PVC. The entire extent of the project involved laying roughly ½ a mile of 8" main & another ½ mile of service pipes along Columbia Street (Jacobson Rd to SR4) & East State Route 4 (Island View Lane vicinity). The change increases available fire flow & eliminates a notoriously leak-prone stretch of main that was incredibly difficult to monitor due to the fact that it ran cross-country, through a creek, & up & down rarely travelled brush covered hills.

With the help of observant residents, we continue to find leaks around town & these have helped us reduce the amount of water lost in our system. This saves on wasted chemicals & wasted energy & ultimately will save the customer some money. We attempt to repair and/or isolate all leaks as fast as we can, but not all leaks are created equally & some unfortunately take longer than others to deal with. However, please know that any & all leaks reported to us are investigated so don't be shy in reporting suspected leaks!

To save everyone some time & disruption, if you are replacing the line from your meter to the house, please let us know; perhaps we can do some work on our end at the same time. If you do replace your supply line, please make sure that you install a shut off valve in a place convenient for you. The best time to have your shut off installed is when you don't need it… installing one when the water is pouring into your basement at 3 in the morning… the horse has left the barn!

Water is a valuable resource. You will be amazed at how a little drip adds up over time. This chart, from buffalowater.org shows the water loss from really small leaks. Fix those small leaks!

WATER LOSS IN GALLONS					
LEAK SIZE	**LOSS PER DAY**	**LOSS PER MONTH**	**LEAK 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**

We chlorinate our water to make it safe to drink. The chlorination stops bacteria from multiplying & making people sick. We add fluoride to the water. Fluoride offers tremendous health benefits & is one of the best public health values available. In 2018 we replaced our aged fluoridation equipment & the new equipment was fully funded with grant money from NACCHO.

We're proud of this year's report. We want to keep you informed about the water you have received over the past year. Our goal is to supply safe & dependable drinking water. If you have any questions about this report or concerning your water utility, please contact David McNally at (360)795-8032 x4. To learn more, please attend a Town Council meeting usually held on the first & third Mondays of each month at 6 p.m. in the Cathlamet Fire Hall DeBriae Meeting Room (currently, meetings are held via Zoom).

Our Department of Health Office of Drinking Water identification number is system 11850D. The table below lists the results of our monitoring for the period of January 1st to December 31st, 2020 & our most recent lead testing results. 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 water poses a health risk. More information about contaminants & 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 undergoing chemotherapy, persons who have undergone organ transplants, people with HIV/AIDS or other immune system disorders, some elderly, & 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 & other microbial contaminants are available from the Safe Drinking Water Hotline (1-800-426-4791).

There has been much concern nationally about lead in drinking water. In Cathlamet & indeed most of Washington State, lead in drinking water comes primarily from materials & components used in household plumbing. The more time water has been sitting in pipes, the more dissolved metals, such as lead, it may contain. Elevated levels of lead can cause serious health problems, especially in pregnant women & 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 through the tap until the water is noticeably colder before using for drinking and/or cooking (30 seconds to two (2) minutes.) You can use the flushed water for watering plants, washing dishes, or general cleaning. Most new houses & remodeled homes will have no lead in the plumbing systems. Only use water from the cold-water tap for drinking, cooking, & 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.

To ensure that tap water is safe to drink, the Department of Health & EPA prescribe regulations that limit the amount of certain contaminants in water provided by public water systems. The Food & Drug Administration (FDA) & the Washington Department of Agriculture regulations establish limits for bottled water contaminants that must provide the same public health protection.

Cathlamet's water is treated with chemicals that help reduce the turbidity (amount of suspended material); with chlorine to kill potentially harmful bugs; & with fluoride to promote healthy teeth.

In the following table you will find terms & abbreviations you might not be familiar with. To help you better understand these terms we've provided the following definitions:

Non-Detects (ND) - laboratory analysis indicates that the constituent is not present.

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

Parts per billion (ppb) / Micrograms per liter - one part per billion corresponds to one minute in 2,000 years, or a single penny in $10,000,000.

Parts per trillion (ppt) / Nanograms per liter (nanograms/l) - one part per trillion corresponds to one minute in 2,000,000 years, or a single penny in $10,000,000,000.

Maximum Contaminant Level or 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 or 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.

TEST RESULTS						
CONTAMINANT	VIOLATION (Y/N)	LEVEL DETECTED	UNIT MEASUREMENT	MCLG	MCL	LIKELY SOURCE OF CONTAMINATION
ORGANIC CONTAMINANTS						
Total coliform bacteria	N	0	Count	0	Presence/ Absence	Naturally present in the environment (if present)
Total Organic Carbon	N	Low = < .50; High = 3.02; Average = 0.87	ppm	N/A	N/A	Organic materials in source water
Pesticides	N	ND	Ppm/ppt	0	Not detected	Herbicides & pesticides used industrially or on private homeowner's property.
INORGANIC CONTAMINANTS						
Chlorine	N	Low = 0.57; High = 3.77; Average = 1.48	ppm	MRDLG = 4	MRDL = 4	Water additive used to control microbes
Fluoride	N	Low = 0.76; High = 0.94; Average = 0.82	ppm	4	4	Erosion of natural deposits; water additive which promotes strong teeth; discharge from fertilizer & aluminum factories
Lead (results from 2019)	N	Low = <.001; High = .004	ppb	0	15	Corrosion of household plumbing systems: erosion of natural deposits.
Nitrate (as Nitrogen)	N	0.63	ppb	10	10	Runoff from fertilizer use; leaching from septic tanks, sewage; erosion of natural deposits
VOLATILE ORGANIC CONTAMINANTS						
Volatile organic compounds	N	ND	ppt	n/a	varies	Byproduct of industry discharge etc.
Haloacetic Acids (HAA)	N	Low = 24,000; High = 52,200; Average= 35,300	ppt	n/a	MCL = 60,000	Byproduct of drinking water disinfection
TTHM (Total trihalomethanes)	N	Low = 13,600; High = 43,550; Average= 28,190	ppt	n/a	80,000	By-product of drinking water disinfection
Turbidity	N/A	0.05	NTU	n/a	0.3	Cloudiness of water. 0.05 NTU represents the highest average monthly turbidity measured every 4 hours of filter production.

Organic Contaminants:

Coliforms are bacteria that are naturally present in the environment & are used as an indicator that other, potentially harmful, bacteria may be present. If coliforms were found in more samples than allowed this would be a warning of potential problems.

Total Organic Carbon (TOC) has no health effects. However, TOC provides a medium for the formation of disinfection by-products (see Volatile Organic Compounds below). A higher TOC level can result in more opportunity for VOC levels to rise which in turn can cause health impacts.

Herbicides/Pesticides: May come from a variety of sources such as agriculture urban storm water runoff & residential uses.

Inorganic Contaminants:

Chlorine. Some people who use water containing chlorine well in excess of the MRDL could experience irritating effects to their eyes & nose. Some people who drink water containing chlorine in excess of the MRDL could experience stomach discomfort.

Fluoride. Some people who drink water containing fluoride in excess of the MCL over many years could get bone disease, including pain & tenderness of the bones. Children may get mottled teeth.

Lead. Infants & 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 & learning abilities. Adults who drink water with excess lead over many years cold develop kidney problems or high blood pressure.

Nitrate. 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 & blue-baby syndrome.

In 2016 the Washington Administrative Code (WAC) for drinking water was amended to lower the amount of fluoride that is added to our water. The reason for this is that fluoride is available from other sources now, like toothpaste, mouthwash, & products made from fluoridated water. Science shows it is crucial to the development of strong teeth that children have fluoride & water is the best source of this. Children should never swallow toothpaste (a pea sized amount is enough to brush teeth, despite what the commercials show being placed on a toothbrush.) In large water systems the public health savings are that each dollar spent in fluoridation saves $38 in dental care & the cost of an entire lifetime of fluoridation is less than the cost of a single cavity. The only way to remove fluoride from your drinking water is with a reverse osmosis filter: think long before making that investment.

Volatile Organic Contaminants:

Volatile Organic Compounds: Including synthetic & volatile organic chemicals which are by-products of industrial processes & petroleum production, & can also come from gas stations, urban storm water runoff, & septic systems.

Haloacetic Acids (HAA). Some people who drink water containing haloacetic acids in excess of the MCL over many years may have an increased risk of getting cancer.

TTHMs (Total Trihalomethanes). Some people who drink water containing trihalomethanes in excess of the MCL over many years may experience problems with their liver, kidneys, or central nervous systems, & may have an increased risk of getting cancer.

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

As you can see by the table, our system had no violations. We're proud that your drinking water meets or exceeds all Federal & State requirements. We have learned through our monitoring & testing that some contaminants have been detected. The EPA has determined that your water IS SAFE at these levels.

MCL's 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 level for a lifetime to have a one-in-a-million chance of having the described health effect.

Rarely something will happen that may cause deposits on the inside of our water main supply lines to become agitated & color your water at home. Usually such changes in color are a result of high flow usage from a fire hydrant or leak. Rest assured, although the water looks unpalatable, it is OK. Please let us know if this happens in your home & we will investigate. Some of these particles are so fine that water can take days to settle out. Often the quickest solution is to call us & we can flow hydrants and/or let your water run to clear your supply.

In our continuing efforts to maintain a safe & dependable water supply it is necessary to make improvements to your water system. The larger of these improvements are discussed at Town Council meetings.

The Cathlamet Water System staff is dedicated to providing top quality water to every user. We ask that all our customers help us protect our water sources, which are the heart of our community, our way of life & our children's future. Please be careful when disposing of chemicals, medicines, & petroleum products. Think before you pour anything on the ground, into the storm drains or into the sewer system.

Water Use Efficiency: Water systems have a goal of having 90% of the water made be metered to customers. The 10% goal that is not metered includes leaks, bad meters, fire hydrant use, really absolutely anything that is not sold to customers. In 2017 our water loss was 23.9%, in 2018 it was 20.8%, in 2019 we dropped our loss to 15.1%. For 2020, we slightly increased our loss to 15.8%. While still a marked improvement from years past, that's still roughly 13.25 million gallons of water unaccounted for last year (or 36,000 gallons per day!!). Together we can keep this improvement going strong. If you want more information on this, please contact me & please, keep your eyes & ears open for leaks.

Take a moment to locate your water shut off. You should have one at your house. Know where your meter box is located & please help us by keeping the grounds around it maintained. Many customers have a shutoff between the water meter & their house. Test it. If your shut off does not work install a new one. If your meter box is filled with dirt clean it out so you can find that valve. Please, I repeat, please, DO NOT BURY and/or cover your meter box. While many services are now radio metered, it is crucial that you do not think it's now OK to bury your meter box. In the event of a water emergency, neither the Public Works crew nor the homeowner will want to waste precious time probing for wherever your meter box may be located, & then have to dig out the area to gain access to the shutoff.

If you have a system to automatically water your grass or livestock, by plumbing code you **MUST** have a backflow prevention device & most of these are required to be certified annually. If there is any potential of water flowing back into our system (think siphon, or a hose draped into any water source that could flow back to the mains with a loss in pressure) then you need that backflow device. These range from simple air gaps to engineered devices. Most are fairly common & thus relatively inexpensive. **Thank you!**

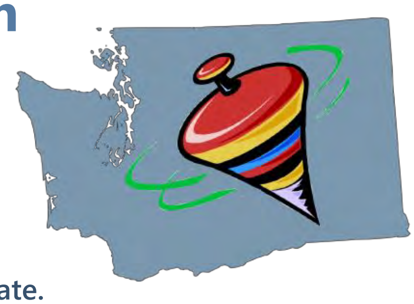
David McNally   Jay Watson   Cory Kelly   David Florek   Troy Gorley

APPENDIX H

TREATMENT OPTIMIZATION PROGRAM

Treatment Optimization Program

The Washington Treatment Optimization Program (TOP) is an effort to improve performance of surface water treatment facilities. TOP focuses on particle removal and disinfection to maximize public health protection from microbial contaminants.



The Washington Department of Health has adopted performance goals for all rapid rate surface water treatment plants in the state.

Optimized Performance

Filtration

- Filtered water turbidity $\le$ 0.10 NTU 95 percent of the time, based upon maximum daily values recorded.
- Filtered water $\le$ 0.10 NTU within 15 minutes of filter being in production.
- Maximum filtered water turbidity $\le$ 0.30 NTU.
- Filters are backwashed before breakthrough.
- Raw water turbidity changes do not affect filtered water turbidity.

Sedimentation

- Settled water turbidity $\le$ 2 NTU 95 percent of the time when annual average source turbidity $>$ 10 NTU.
- Settled water turbidity $\le$ 1 NTU 95 percent of the time when annual average source turbidity $\le$ 10 NTU.

Disinfection

- Required CT values are achieved at all times.

Turbidity Monitoring

- Raw water turbidity is monitored at least every 4 hours.
- Effluent turbidity is continuously recorded for each filter.
- Combined filter effluent turbidity is continuously recorded.

For more information about TOP, contact Stephen Baker at 360-236-3138 or stephen.baker@doh.wa.gov.

APPENDIX I

WATER QUALITY MONITORING SCHEDULE

Water Quality Monitoring Schedule

System: CATHLAMET WATER DEPT **PWS ID: 11850 D** **Region: SOUTHWEST**
Contact: David S McNally **Group: A - Comm** **County: WAHKIAKUM**

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

	May 2022	Jun 2022	Jul 2022	Aug 2022	Sep 2022	Oct 2022	Nov 2022	Dec 2022	Jan 2023	Feb 2023	Mar 2023	Apr 2023
Coliform Monitoring Population	1638	1395	1259	1268	1585	1631	1626	1631	1624	1607	1618	1613
Number of Routine Samples Required	2	2	2	2	2	2	2	2	2	2	2	2

- 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	10	Jan 2020 - Dec 2022	standard - 3 year	08/02/2019	***Aug 2022***	
Asbestos	1	Jan 2020 - Dec 2028	standard - 9 year	06/30/2021		
Total Trihalomethane (THM)	1	Jan 2022 - Dec 2022	reduced - 1 year	02/18/2021	***Aug 2022***	
Halo-Acetic Acids (HAA5)	1	Jan 2022 - Dec 2022	reduced - 1 year	02/18/2021	***Aug 2022***	

Water Quality Monitoring Schedule

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 no more than 12 hours (e.g. overnight).
- If you are sampling from a faucet that has hot water, make sure cold water is the last water to run through the faucet before it sits overnight.
- If your sampling frequency is annual or every 3 years, collect samples between June 1 and September 30.

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.

For *Disinfection Byproducts (HAA5 and THM):* Collect the samples at the locations identified in your Disinfection Byproducts (DBP) monitoring plan.

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 ELOCHOMAN RIVER Surface Use - Permanent Susceptility - High

Test Panel/Analyte	*# Samples Required*	*Compliance Period*	*Frequency*	*Last Sample Date*	*Next Sample Due*
Nitrate	1	Jan 2022 - Dec 2022	standard - 1 year	11/02/2021	***Sep 2022***
Complete Inorganic (IOC)	1	Jan 2020 - Dec 2028	waiver - 9 year	10/10/2019	Oct 2028
Iron	1	Jan 2020 - Dec 2022	standard - 3 year	10/23/2020	
Volatile Organics (VOC)	1	Jan 2020 - Dec 2025	waiver - 6 year	09/11/2018	Sep 2024
Herbicides	1	Jan 2014 - Dec 2022	waiver - 9 year	11/06/2018	
Pesticides	0	Jan 2020 - Dec 2022	waiver - 3 year	10/14/2010	
Soil Fumigants	0	Jan 2020 - Dec 2022	waiver - 3 year		
Gross Alpha	1	Jan 2020 - Dec 2025	standard - 6 year	09/29/2021	
Radium 228	1	Jan 2020 - Dec 2025	standard - 6 year	09/29/2021	

Water Quality Monitoring Schedule

Other Information

Other Reporting Schedules	*Due Date*
Measure chlorine residuals and submit monthly reports if your system uses continuous chlorination:	monthly
Submit Consumer Confidence Report (CCR) to customers and ODW (Community systems only):	07/01/2022
Submit CCR certification form to ODW (Community systems only):	10/01/2022
Submit Water Use Efficiency report online to ODW and to customers (Community and other municipal water systems only):	07/01/2022
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

Special Notes

NOTE: Please remember that asbestos is a distribution requirement and should not be marked as coming from S01, even though S01 is your only source. Thanks!

Southwest Regional Water Quality Monitoring Contacts

For questions regarding chemical monitoring:	Sophia Petro: (360) 236-3046 or sophia.petro@doh.wa.gov
For questions regarding DBPs:	Regina Grimm, p.e.: (360) 236-3035 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 J

WATER RIGHT SELF-ASSESSMENT FORM

Water Right Self-Assessment Form for Water System Plans

331-372 • 1/13/2017

All water right permits, claims, and certificates must be evaluated in a water right self-assessment for all sources used to supply the water system. The self-assessment compares the parameters and other limitations of existing water rights against current and forecasted water production, as described in your water system plan, to determine whether the rights are adequate to serve your system's current and future water needs.

You must account for all sources of supply and total quantities of water withdrawn from the source. If you purchase water from another purveyor through a non-emergency intertie, you must complete the INTERTIES section of the self-assessment.

A Note on Exempt Wells

If you're seeking DOH approval of a new Group A or Group B water system using an exempt well, you must complete the self-assessment, although certain fields will not apply. Talk to your DOH regional planner about using the Water Right Self-Assessment form for a Small Water System Management Program instead of this version.

Local governments must ensure that an adequate potable water supply is available from the exempt well before issuing a building permit. Before developing a permit exempt well, check with your local authorities on their criteria for establishing an adequate potable water supply for your planned public water system.

Water Right Parameters

Below is a brief description of the parameters associated with a typical water right. For the self-assessment, you only need to describe the last two bulleted items if they apply to your water rights.

Source Type – this refers to whether the source is surface water, groundwater or a spring.
Source Location – this refers to the location of points of groundwater withdrawal or surface water diversion for each right.
Purpose of Use – this refers to the type of use, such as municipal water supply, community domestic, industrial or agricultural purposes.
Place of Use – this describes where water can be put to beneficial use under the right. Under the 2003 Municipal Water Law, RCW 90.03.386, the place of use for a water right held for municipal water supply purposes may be the system's service area as identified in an approved water system plan or small water system management program. See Ecology Policy 2030 for information on how Ecology administers the Municipal Water Law.

Period of Use – this refers to time-of-year limitations in which the water right may be put to use. If any water right has a time-of-year limitation, please include this information in the INTERRUPTIBLE WATER RIGHTS section.

Provisions or Limiting Conditions – this refers to any provisions or conditions placed on the water right. If a water right has a limiting condition or other provision, such as a collection and reporting requirement, other than a time-of year limitation, include this information in the ADDITIONAL COMMENTS section at the bottom of the self-assessment and in the water system plan narrative.

See Ecology Policy 1040 for more information on water right terminology. If you have questions about your water rights, please contact the Ecology regional office in your area.

Completing the Water Right Self-Assessment Form

The self-assessment is a Word document to allow users to make changes or to expand the document. You may use another format, if preferred, as long as all required information is included. Below is a description of all fields and how to complete them. This form is divided into four different sections. Each section is described in the headings below.

See the column identifiers (A, B, C, etc) at the bottom of each column for guidance in completing the necessary calculations.

Water Right Permit, Certificate, or Claim Number: This number is assigned by Ecology when a permit application is filed. It's listed at the top of the permit or certificate. For water right claims, this is the registration number stamped in the lower left hand corner of the claim form.

WFI Source #: Identify the individual sources (e.g. well #1, well #2) as defined on the DOH Water Facilities Inventory form. If a water right is associated with multiple sources, list all sources in the same row in this column. If a source is associated with multiple water rights, identify each water right on a separate row.

If you have any source(s) that is not currently being used (categorized as standby, back-up, or emergency), and the source has an associated water right that is not listed in column #1, please include the source and water right information in the ADDITIONAL COMMENTS section. This will identify that the source is still intended for a beneficial use under RCW 90.03.015(4). See Ecology Policy 1040.

EXISTING WATER RIGHTS SECTION *(olive green color, top section)*

This section refers to existing water rights. It does not include any water right applications that have been submitted to Ecology.

Primary Qi (Instantaneous Quantity): This is also known as instantaneous flow rate. It's the amount of water allowed to be taken under the right from the source during a period of peak operation. For surface water, this is generally expressed in terms of cubic feet per second (cfs). For groundwater, this is generally expressed in terms of gallons per minute (gpm). One cfs equals 448.8 gpm. Please indicate the units of measurement you are using for each source. If there are situations where the flow rate will be limited (e.g. limitations established on the source when other sources are utilized), please note them in the ADDITIONAL COMMENTS section in the form and in the WSP narrative.

Non-Additive Qi: This term was formally known as "supplemental." Your water rights may use the old terminology. See Ecology Policy 1040 for more information. Not all water rights have non-additive quantities. If a water right has non-additive Qi quantities, include the non-additive quantity in this field. This is generally listed in the "quantity, type of use, period of use" section on both permits and certificates. *Non-additive quantities should not be included in the primary Qi totals.*

Primary Qa (Annual Quantity): This is the amount of water that can be taken from the source under the right on an annual basis. It's usually expressed in terms of acre-feet. An acre-foot is the amount of water necessary to submerge an acre of land to a depth of one foot. One acre-foot equals 43,560 cubic feet or 325,851 gallons of water.

Non-Additive Qa: This term was formerly known as "supplemental." Your water rights may use the old terminology. See Ecology Policy 1040 for more information. Not all water rights have non-additive quantities. If a water right has non-additive Qa quantities, include the non-additive quantity in this field. This is generally listed in the "quantity, type of use, period of use" section on both permits and certificates. *Non-additive quantities should not be included in the primary Qa totals.*

CURRENT SOURCE PRODUCTION SECTION *(light green color, top section)*

This section refers to how much water is withdrawn from the source under each water right for the most recent full calendar year. You will need to determine any excess or deficiency for each water right after calculating how much water was withdrawn compared to how much water is allowed under each water right. If demand has decreased over past years, you may wish to include historic maximum production information in the ADDITIONAL COMMENTS section. This will provide a more complete picture of the use of your water rights.

Use the water use data and demand projections from your water system plan to define current and projected water needs. You can determine if you'll need additional water rights based on the comparison of existing water rights, current water production, and projected 10- and 20-year needs.

Total Qi (Instantaneous Quantity): This refers to the total maximum instantaneous flow rate withdrawn from the source under each water right during the most recent calendar year. For surface water, this is expressed in terms of cubic feet per second (cfs). For groundwater, this is expressed in terms of gallons per minute (gpm). One cfs equals 448.8 gpm.

Current Excess or Deficiency (Qi): Please calculate the excess or deficiency for each water right after comparing the total amount withdrawn against each water right. Please use parentheses for deficient amounts.

Total Qa (Annual Quantity): This refers to the total volume of water withdrawn from each source under each water right during the most recent calendar year. It's usually expressed in acre-feet.

Current Excess or Deficiency (Qa): Please calculate the excess or deficiency for each water right after comparing the total amount withdrawn against each water right. Please use parentheses for deficient amounts.

10-YEAR FORECASTED SOURCE PRODUCTION SECTION *(light blue color, top section)*

This section refers to how much water you project to withdraw from each source in ten years as determined in your water system plan. Please complete this section in the same manner (using the same units of measurement) as the current source production section using your 10-year forecasted amounts.

20-YEAR FORECASTED SOURCE PRODUCTION SECTION *(darker blue color, top section)*

This section refers to how much water you project to withdraw from each source in twenty years as determined in your water system plan. Please complete this section in the same manner (using the same units of measurement) as the current source production section using your 20-year forecasted amounts. If you are unable to provide 20-year forecasts for each source, you may choose to include the combined 20-year total at the bottom.

PENDING WATER RIGHTS SECTION *(second section of form)*

Please complete this section for any water right applications that have been submitted to Ecology. Please include the application number, whether it's a new or a change application, the date submitted, and the total quantities requested.

INTERTIES SECTION *(third section of form)*

This section must be completed by purveyors who purchase any amount of wholesale water. If your system sells water to another public water system, include the quantity sold in the CURRENT SOURCE PRODUCTION section.

Purchasers of wholesale water must account for all water obtained through the intertie for non-emergency supply purposes. This is to ensure that all sources of supply are considered when evaluating whether new water rights are needed within 20 years.

Please identify the maximum quantity of water, expressed in the same manner as the above sections, allowed under each intertie contract. If there are limiting conditions or temporary agreements that effect the long-term use of the intertie, you must account for such limiting conditions when evaluating the current and forecasted water supply needs in your water system plan.

Finally, purchasers of wholesale water are responsible for ensuring that the underlying water right (held by the purveyor selling water) are adequate for such use. You should confirm that the selling system has accounted for the wholesale area in their water system plan to ensure that the water right authorizes the distribution of water through the intertie.

INTERRUPTIBLE WATER RIGHTS SECTION *(bottom section of form)*

This section refers to water rights that have an annual time-of-year interruption. Please complete this section for any water right listed in the above fields that has a time-of-year interruption. Please include the water right number, describe the limitation, and the time period of interruption. Purveyors with interruptible rights should develop a water shortage response plan as part of their water system plan to describe how demand will be met during periods of interruption through aggressive demand-side conservation, fixing leaks or other means.

ADDITIONAL COMMENTS SECTION *(bottom section of form)*

If the system has any source that is not currently being used on a regular basis (such a source may be categorized as stand-by, back-up, emergency), you should identify the source in this section if the source has an associated water right that is not listed in the above sections. The purpose is to identify that such water rights are still intended for a future beneficial use as required under RCW 90.03.015(4). See Page 2, Item 9 (b) in ECY Policy 2030. For these water rights, please briefly describe the future intended use of the source and when you expect to utilize the water right. This does not refer to sources categorized as seasonal sources.

You should also include any other comments in this section that will explain aspects of your water right portfolio that are not identified above.

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) 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. C 10260	Elochoman River	372.5 gpm		572.3		372.5	0	361.1	211.2	372.5	0	424.4	147.9	372.5	0	532.6	39.7
2. C 3968B	Elochoman River	89.8 gpm				77.5	12.3			89.8	0			89.8	0		
3. C 3718B	Elochoman River	134.6 gpm					134.6			134.6	0			134.6	0		
4. C 2929	Elochoman River	224.4 gpm		61.5			224.4		61.5	103.1	121.3		61.5	103.1	121.3		61.5
5. 782C	Abe Creek	224.4 gpm					224.4				224.4				224.4		
6. 40C	Cougar Creek	269.3 gpm					269.3				269.3				269.3		
	TOTALS =	1,315		633.8		450	865	361.1	272.7	700	615	424.4	209.4	700	615	532.6	101.2
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 K

MODELING RESULTS

Cathlamet 2023 WSP Modeling Results
Static Pressures, 2023 Average Day Demand, results for demand nodes only'

ID	Demand (gpm)	Elevation (ft)	Head (ft)	Pressure (psi)
J120	0.43	283	365.59	35.78
J96	0.43	185	277.13	39.92
J97	0.43	185	277.13	39.92
J54	0.43	185	278.12	40.35
J56	0.43	185	278.13	40.36
J115	0.43	260	365.59	45.75
J116	0.43	260	365.59	45.75
J143	0.43	170	277.2	46.45
J117	0.43	255	365.58	47.91
J59	0.43	225	336.93	48.5
J209	0.43	225	336.93	48.5
J178	0.43	423	540.74	51.02
J99	0.43	155	277.19	52.95
J100	0.43	155	277.2	52.95
J153	0.43	155	277.2	52.95
J118	0.43	243	365.58	53.11
J57	0.43	155	278.13	53.35
J213	0.43	240	365.59	54.42
J98	0.43	150	277.14	55.09
J148	0.43	150	277.22	55.12
J147	0.43	150	277.22	55.12
J149	0.43	150	277.22	55.13
J95	0.43	145	277.12	57.25
J145	0.43	145	277.21	57.29
J144	0.43	145	277.21	57.29
J146	0.43	145	277.21	57.29
J151	0.43	145	277.22	57.29
J150	0.43	145	277.23	57.29
J189	0.43	143	277.81	58.41
J179	0.43	405	540.74	58.82
J180	0.43	405	540.74	58.82
J87	0.43	140	277.12	59.41
J88	0.43	140	277.13	59.42
J89	0.43	140	277.15	59.43
J152	0.43	140	277.22	59.46
J159	0.43	225	365.58	60.91
J157	0.43	225	365.58	60.91
J158	0.43	225	365.58	60.91
J36	0.43	137	277.87	61.04
J58	0.43	195	336.93	61.5
J212	0.43	135	277.21	61.62
J101	0.43	135	277.21	61.62
J154	0.43	135	277.25	61.64

Cathlamet 2023 WSP Modeling Results

Static Pressures, 2023 Average Day Demand, results for demand nodes only'

ID	Demand (gpm)	Elevation (ft)	Head (ft)	Pressure (psi)
J171	0.43	222	365.59	62.22
J193	0.43	132	277.25	62.94
J160	0.43	220	365.58	63.08
J156	0.43	220	365.58	63.08
J169	0.43	220	365.58	63.08
J122	0.43	220	365.59	63.08
J177	0.43	395	540.74	63.15
J163	0.43	219	365.58	63.51
J55	0.43	190	336.93	63.66
J121	0.43	218	365.59	63.95
J162	0.43	215	365.58	65.25
J170	0.43	215	365.59	65.25
J90	0.43	125	277.18	65.94
J102	0.43	125	277.21	65.95
J103	0.43	122	277.21	67.25
J111	0.43	210	365.58	67.41
J108	0.43	210	365.58	67.41
J161	0.43	210	365.58	67.41
J155	0.43	210	365.58	67.41
J172	0.43	210	365.59	67.42
J125	0.43	208	365.58	68.28
J124	0.43	208	365.58	68.28
J128	0.43	205	365.58	69.58
J129	0.43	205	365.58	69.58
J109	0.43	205	365.58	69.58
J107	0.43	205	365.58	69.58
J127	0.43	205	365.58	69.58
J126	0.43	205	365.58	69.58
J123	0.43	205	365.58	69.58
J119	0.43	200	365.57	71.74
J110	0.43	200	365.58	71.74
J105	0.43	200	365.58	71.74
J106	0.43	200	365.58	71.74
J166	0.43	198	365.58	72.61
J164	0.43	195	365.58	73.91
J183	0.43	370	540.74	73.98
J130	0.43	190	365.58	76.08
J167	0.43	190	365.58	76.08
J181	0.43	362	540.74	77.45
J104	0.43	185	365.58	78.24
J168	0.43	185	365.58	78.25
J192	0.43	360	540.74	78.31
J91	0.43	95	277.21	78.95

Cathlamet 2023 WSP Modeling Results
Static Pressures, 2023 Average Day Demand, results for demand nodes only'

ID	Demand (gpm)	Elevation (ft)	Head (ft)	Pressure (psi)
J135	0.43	183	365.58	79.11
J131	0.43	183	365.58	79.11
J137	0.43	180	365.58	80.41
J136	0.43	180	365.58	80.41
J113	0.43	180	365.58	80.41
J112	0.43	180	365.58	80.41
J114	0.43	180	365.58	80.41
J184	0.43	450	635.91	80.55
J86	0.43	90	277.06	81.05
J92	0.43	90	277.22	81.12
J165	0.43	178	365.58	81.28
J191	0.43	85	277.03	83.21
J140	0.43	170	365.58	84.74
J141	0.43	170	365.58	84.74
J138	0.43	170	365.58	84.74
J139	0.43	170	365.58	84.74
J175	0.43	440	635.91	84.89
J142	0.43	165	365.58	86.91
J134	0.43	165	365.58	86.91
J133	0.43	165	365.58	86.91
J132	0.43	165	365.58	86.91
J176	0.43	435	635.91	87.05
J17	0.43	75	278.45	88.15
J51	0.43	70	277.59	89.95
J52	0.43	70	277.59	89.95
J53	0.43	70	277.64	89.97
J190	0.43	70	277.64	89.97
J27	0.43	68	278.22	91.09
J24	0.43	65	278.46	92.49
J85	0.43	60	277.09	94.07
J50	0.43	58	277.57	95.14
J35	0.43	58	278.09	95.36
J25	0.43	58	278.46	95.52
J28	0.43	55	278.16	96.69
J182	0.43	315	540.74	97.81
J76	0.43	50	277.27	98.48
J70	0.43	50	277.32	98.5
J69	0.43	50	277.32	98.5
J68	0.43	50	277.4	98.53
J48	0.43	50	277.48	98.57
J49	0.43	50	277.48	98.57
J34	0.43	50	278.11	98.84
J75	0.43	48	277.25	99.33

Cathlamet 2023 WSP Modeling Results
Static Pressures, 2023 Average Day Demand, results for demand nodes only'

ID	Demand (gpm)	Elevation (ft)	Head (ft)	Pressure (psi)
J174	0.43	405	635.91	100.05
J29	0.43	47	278.12	100.14
J94	0.43	46	277.24	100.2
J84	0.43	45	277.15	100.59
J93	0.43	45	277.24	100.63
J67	0.43	45	277.4	100.7
J83	0.43	42	277.19	101.91
J26	0.43	43	278.45	102.02
J185	0.43	400	635.91	102.22
J30	0.43	42	278.12	102.31
J1	0.43	40	278.46	103.32
J2	0.43	40	278.46	103.32
J23	0.43	40	278.46	103.32
J74	0.43	35	277.25	104.97
J73	0.43	35	277.25	104.97
J47	0.43	35	277.48	105.07
J45	0.43	32	277.48	106.37
J72	0.43	30	277.27	107.14
J64	0.43	30	277.34	107.17
J65	0.43	30	277.35	107.18
J66	0.43	30	277.45	107.22
J211	0.43	30	277.56	107.27
J37	0.43	30	277.57	107.27
J4	0.43	27	278.45	108.95
J80	0.43	25	277.24	109.3
J21	0.43	25	278.45	109.82
J14	0.43	25	278.45	109.82
J11	0.43	25	278.45	109.82
J13	0.43	25	278.45	109.82
J9	0.43	25	278.45	109.82
J8	0.43	25	278.45	109.82
J19	0.43	25	278.45	109.82
J196	0.43	25	278.45	109.82
J195	0.43	25	278.45	109.82
J7	0.43	25	278.45	109.82
J71	0.43	23	277.29	110.18
J63	0.43	22	277.33	110.63
J15	0.43	20	278.45	111.99
J18	0.43	20	278.45	111.99
J22	0.43	20	278.45	111.99
J44	0.43	19	277.5	112.01
J81	0.43	18	277.22	112.32
J16	0.43	18	278.45	112.85

Cathlamet 2023 WSP Modeling Results

Static Pressures, 2023 Average Day Demand, results for demand nodes only'

ID	Demand (gpm)	Elevation (ft)	Head (ft)	Pressure (psi)
J6	0.43	18	278.45	112.85
J31	0.43	17	278.11	113.14
J32	0.43	17	278.12	113.14
J33	0.43	17	278.12	113.14
J82	0.43	15	277.21	113.62
J77	0.43	15	277.24	113.63
J78	0.43	15	277.24	113.63
J46	0.43	14	277.5	114.17
J38	0.43	13	277.56	114.64
J79	0.43	12	277.24	114.93
J43	0.43	10	277.52	115.92
J39	0.43	10	277.56	115.93
J20	0.43	10	278.45	116.32
J5	0.43	10	278.45	116.32
J3	0.43	10	278.46	116.32
J40	0.43	6	277.56	117.67
J42	0.43	5	277.55	118.1
J41	0.43	5	277.56	118.1
J173	0.43	257	540.74	122.94
J210	0.43	275	674.21	172.98
J188	0.43	240	678.75	190.11

Static Pressures, 2023 Peak Hour Demand, results for demand nodes only'

ID	Demand (gpm)	Elevation (ft)	Head (ft)	Pressure (psi)	
J97	2.31	185	253.1	29.51	rounds up to 30, just downstream of the Columbia PRV, pressure could be raised by adjusting this PRV setting
J96	2.31	185	253.1	29.51	rounds up to 30, just downstream of the Columbia PRV, pressure could be raised by adjusting this PRV setting
J120	2.31	283	362.98	34.65	
J54	2.31	185	267.51	35.75	
J56	2.31	185	267.77	35.86	
J143	2.31	170	254.13	36.46	
J99	2.31	155	253.9	42.86	
J100	2.31	155	253.94	42.87	
J153	2.31	155	254.08	42.93	
J115	2.31	260	362.97	44.62	
J116	2.31	260	362.98	44.62	
J98	2.31	150	253.08	44.66	
J148	2.31	150	254.19	45.15	
J147	2.31	150	254.19	45.15	
J149	2.31	150	254.26	45.18	
J95	2.31	145	252.68	46.66	
J117	2.31	255	362.85	46.73	
J145	2.31	145	254.13	47.29	
J144	2.31	145	254.14	47.29	
J146	2.31	145	254.16	47.3	
J151	2.31	145	254.23	47.33	
J150	2.31	145	254.34	47.38	
J59	2.31	225	336.93	48.5	
J209	2.31	225	336.93	48.5	
J87	2.31	140	252.65	48.81	
J57	2.31	155	267.77	48.86	
J88	2.31	140	252.83	48.89	
J89	2.31	140	253.11	49.01	
J152	2.31	140	254.22	49.49	
J178	2.31	423	538.67	50.12	
J212	2.31	135	254.07	51.59	
J101	2.31	135	254.07	51.59	
J189	2.31	143	262.65	51.85	
J154	2.31	135	254.69	51.86	
J118	2.31	243	362.81	51.91	
J193	2.31	132	254.69	53.16	

Static Pressures, 2023 Peak Hour Demand, results for demand nodes only'

ID	Demand (gpm)	Elevation (ft)	Head (ft)	Pressure (psi)
J213	2.31	240	362.98	53.29
J36	2.31	137	263.66	54.88
J90	2.31	125	253.6	55.72
J102	2.31	125	254.09	55.93
J103	2.31	122	254.09	57.23
J180	2.31	405	538.66	57.91
J179	2.31	405	538.66	57.91
J159	2.31	225	362.09	59.4
J157	2.31	225	362.09	59.4
J158	2.31	225	362.09	59.4
J171	2.31	222	362.99	61.09
J58	2.31	195	336.92	61.5
J160	2.31	220	362.09	61.57
J156	2.31	220	362.09	61.57
J169	2.31	220	362.9	61.92
J122	2.31	220	363.16	62.03
J163	2.31	219	362.35	62.11
J177	2.31	395	538.7	62.27
J121	2.31	218	363	62.83
J55	2.31	190	336.92	63.66
J162	2.31	215	362.4	63.87
J170	2.31	215	363.4	64.3
J108	2.31	210	361.92	65.82
J111	2.31	210	361.92	65.82
J161	2.31	210	362.09	65.9
J155	2.31	210	362.09	65.9
J172	2.31	210	362.99	66.29
J125	2.31	208	362.4	66.9
J124	2.31	208	362.42	66.91
J109	2.31	205	361.92	67.99
J107	2.31	205	361.92	67.99
J128	2.31	205	361.92	67.99
J129	2.31	205	361.93	68
J127	2.31	205	362.08	68.06
J126	2.31	205	362.09	68.07
J123	2.31	205	362.62	68.3
J91	2.31	95	254.02	68.9
J86	2.31	90	250.88	69.71
J105	2.31	200	361.88	70.14
J110	2.31	200	361.91	70.16

Static Pressures, 2023 Peak Hour Demand, results for demand nodes only'

ID	Demand (gpm)	Elevation (ft)	Head (ft)	Pressure (psi)
J106	2.31	200	361.92	70.16
J119	2.31	200	362.66	70.48
J92	2.31	90	254.04	71.08
J166	2.31	198	362.72	71.37
J191	2.31	85	250.27	71.61
J164	2.31	195	362.42	72.54
J183	2.31	370	538.65	73.08
J130	2.31	190	361.85	74.46
J167	2.31	190	362.78	74.86
J181	2.31	362	538.65	76.54
J104	2.31	185	361.76	76.59
J168	2.31	185	362.91	77.09
J192	2.31	360	538.65	77.41
J135	2.31	183	361.76	77.46
J131	2.31	183	361.79	77.47
J137	2.31	180	361.76	78.75
J136	2.31	180	361.76	78.76
J113	2.31	180	362.11	78.91
J112	2.31	180	362.13	78.92
J114	2.31	180	362.24	78.96
J184	2.31	450	633.73	79.61
J165	2.31	178	362.72	80.04
J51	2.31	70	259.5	82.11
J52	2.31	70	259.54	82.13
J190	2.31	70	260.25	82.43
J53	2.31	70	260.25	82.43
J85	2.31	60	251.5	82.98
J140	2.31	170	361.75	83.09
J141	2.31	170	361.75	83.09
J139	2.31	170	361.75	83.09
J138	2.31	170	361.75	83.09
J175	2.31	440	633.37	83.79
J142	2.31	165	361.75	85.25
J134	2.31	165	361.75	85.25
J133	2.31	165	361.79	85.27
J132	2.31	165	361.79	85.27
J17	2.31	75	272.29	85.49
J176	2.31	435	633.37	85.95
J27	2.31	68	268.92	87.06
J50	2.31	58	259.12	87.15

Static Pressures, 2023 Peak Hour Demand, results for demand nodes only'

ID	Demand (gpm)	Elevation (ft)	Head (ft)	Pressure (psi)
J76	2.31	50	254.64	88.67
J70	2.31	50	255.4	89
J69	2.31	50	255.53	89.06
J75	2.31	48	254.28	89.38
J68	2.31	50	256.67	89.55
J84	2.31	45	252.59	89.95
J24	2.31	65	272.6	89.95
J48	2.31	50	257.75	90.02
J49	2.31	50	257.8	90.04
J94	2.31	46	254.23	90.22
J35	2.31	58	266.92	90.52
J93	2.31	45	254.23	90.66
J83	2.31	42	253.29	91.55
J67	2.31	45	256.67	91.72
J28	2.31	55	267.97	92.28
J25	2.31	58	272.52	92.95
J34	2.31	50	267.17	94.1
J74	2.31	35	254.22	94.99
J73	2.31	35	254.25	95
J29	2.31	47	267.38	95.49
J47	2.31	35	257.76	96.52
J182	2.31	315	538.65	96.91
J72	2.31	30	254.56	97.3
J30	2.31	42	267.38	97.66
J64	2.31	30	255.65	97.78
J45	2.31	32	257.77	97.83
J65	2.31	30	255.84	97.86
J66	2.31	30	257.33	98.5
J174	2.31	405	633.37	98.95
J211	2.31	30	259.02	99.23
J80	2.31	25	254.17	99.3
J37	2.31	30	259.18	99.3
J26	2.31	43	272.47	99.43
J71	2.31	23	254.93	100.5
J23	2.31	40	272.46	100.73
J1	2.31	40	272.46	100.73
J2	2.31	40	272.46	100.73
J63	2.31	22	255.52	101.18
J185	2.31	400	633.73	101.28
J81	2.31	18	253.79	102.17

Static Pressures, 2023 Peak Hour Demand, results for demand nodes only'

ID	Demand (gpm)	Elevation (ft)	Head (ft)	Pressure (psi)
J82	2.31	15	253.57	103.37
J44	2.31	19	258.04	103.58
J78	2.31	15	254.17	103.63
J77	2.31	15	254.17	103.63
J79	2.31	12	254.17	104.93
J46	2.31	14	257.99	105.72
J4	2.31	27	272.33	106.3
J38	2.31	13	259.03	106.61
J21	2.31	25	272.27	107.14
J14	2.31	25	272.28	107.15
J13	2.31	25	272.28	107.15
J11	2.31	25	272.28	107.15
J9	2.31	25	272.29	107.15
J19	2.31	25	272.29	107.15
J8	2.31	25	272.29	107.15
J196	2.31	25	272.32	107.16
J195	2.31	25	272.32	107.16
J7	2.31	25	272.32	107.16
J43	2.31	10	258.39	107.63
J39	2.31	10	258.99	107.89
J31	2.31	17	267.24	108.43
J32	2.31	17	267.38	108.49
J33	2.31	17	267.38	108.49
J15	2.31	20	272.28	109.31
J18	2.31	20	272.28	109.31
J22	2.31	20	272.32	109.33
J40	2.31	6	258.92	109.59
J42	2.31	5	258.85	109.99
J41	2.31	5	258.9	110.02
J16	2.31	18	272.28	110.18
J6	2.31	18	272.3	110.19
J20	2.31	10	272.3	113.65
J5	2.31	10	272.32	113.66
J3	2.31	10	272.46	113.72
J173	2.31	257	538.4	121.93
J210	2.31	275	671.77	171.92
J188	2.31	240	676.09	188.96

Static Pressures, 2033 Peak Hour Demand, results for demand nodes only'

No CIPs

ID	Demand (gpm)	Elevation (ft)	Head (ft)	Pressure (psi)
J97	2.91	185	249.45	27.92
J96	2.91	185	249.45	27.93
J143	2.91	170	250.37	34.82
J54	2.91	185	265.4	34.84
J56	2.91	185	265.7	34.97
J99	2.91	155	249.99	41.16
J100	2.91	155	250.02	41.17
J153	2.91	155	250.21	41.25
J120	2.91	283	380.49	42.24
J98	2.91	150	249.16	42.97
J148	2.91	150	250.27	43.45
J147	2.91	150	250.27	43.45
J149	2.91	150	250.34	43.48
J95	2.91	145	248.52	44.86
J145	2.91	145	250.22	45.59
J144	2.91	145	250.22	45.59
J146	2.91	145	250.24	45.6
J151	2.91	145	250.3	45.63
J150	2.91	145	250.42	45.68
J87	2.91	140	248.45	46.99
J88	2.91	140	248.71	47.1
J89	2.91	140	249	47.23
J152	2.91	140	250.29	47.79

Static Pressures, 2033 Peak Hour Demand, results for der

Increased 2nd St to 8"

Increased Columbia St PRV settings to 32psi/3

Added Boege Rd/SR4 PRVs

Increased school line to 8"

ID	Demand (gpm)	Elevation (ft)	Head (ft)	Pressure (psi)
J97	2.91	185	258.21	31.72
J96	2.91	185	258.23	31.73
J54	2.91	185	267.43	35.71
J56	2.91	185	267.66	35.81
J178	2.91	423	506	35.96
J143	2.91	170	256.35	37.42
J180	2.91	405	505.99	43.76
J179	2.91	405	505.99	43.76
J153	2.91	155	256.36	43.92
J100	2.91	155	256.37	43.92
J99	2.91	155	256.37	43.92
J98	2.91	150	256.39	46.1
J148	2.91	150	256.44	46.12
J147	2.91	150	256.44	46.12
J149	2.91	150	256.49	46.14
J95	2.91	145	255.96	48.08
J177	2.91	395	506.05	48.12
J145	2.91	145	256.4	48.27
J144	2.91	145	256.41	48.27
J146	2.91	145	256.42	48.28
J151	2.91	145	256.48	48.3
J150	2.91	145	256.56	48.34
J59	2.91	225	336.92	48.5

Static Pressures, 2033 Peak Hour Demand, results for demand nodes only'

No CIPs

ID	Demand (gpm)	Elevation (ft)	Head (ft)	Pressure (psi)
J57	2.91	155	265.7	47.97
J59	2.91	225	336.92	48.5
J209	2.91	225	336.93	48.5
J178	2.91	423	536.15	49.03
J212	2.91	135	250.12	49.88
J101	2.91	135	250.12	49.88
J154	2.91	135	250.79	50.17
J189	2.91	143	259.61	50.53
J193	2.91	132	250.79	51.47
J115	2.91	260	380.49	52.21
J116	2.91	260	380.49	52.21
J36	2.91	137	260.77	53.63
J90	2.91	125	249.52	53.95
J102	2.91	125	250.12	54.22
J117	2.91	255	380.3	54.29
J103	2.91	122	250.12	55.52
J119	2.91	250	380	56.33
J180	2.91	405	536.13	56.82
J179	2.91	405	536.13	56.82
J118	2.91	243	380.23	59.46
J213	2.91	240	380.5	60.88
J177	2.91	395	536.2	61.18
J58	2.91	195	336.92	61.49
J55	2.91	190	336.92	63.66
J159	2.91	225	378.35	66.45
J157	2.91	225	378.35	66.45
J158	2.91	225	378.35	66.45

Static Pressures, 2033 Peak Hour Demand, results for der

Increased 2nd St to 8"

Increased Columbia St PRV settings to 32psi/3

Added Boege Rd/SR4 PRVs

Increased school line to 8"

ID	Demand (gpm)	Elevation (ft)	Head (ft)	Pressure (psi)
J209	2.91	225	336.93	48.5
J57	2.91	155	267.65	48.81
J87	2.91	140	255.77	50.16
J88	2.91	140	255.94	50.24
J89	2.91	140	256.02	50.27
J152	2.91	140	256.47	50.47
J189	2.91	143	263.03	52.01
J212	2.91	135	256.38	52.6
J101	2.91	135	256.38	52.6
J154	2.91	135	256.81	52.78
J193	2.91	132	256.81	54.08
J120	2.91	283	408.27	54.28
J36	2.91	137	263.88	54.98
J90	2.91	125	256.17	56.83
J102	2.91	125	256.38	56.93
J103	2.91	122	256.38	58.23
J183	2.91	370	505.97	58.92
J58	2.91	195	336.92	61.49
J181	2.91	362	505.97	62.38
J192	2.91	360	505.97	63.25
J55	2.91	190	336.92	63.66
J159	2.91	225	372.74	64.02
J157	2.91	225	372.74	64.02
J158	2.91	225	372.74	64.02
J115	2.91	260	408.27	64.25
J116	2.91	260	408.27	64.25
J160	2.91	220	372.74	66.18

Static Pressures, 2033 Peak Hour Demand, results for demand nodes only'

No CIPs

ID	Demand (gpm)	Elevation (ft)	Head (ft)	Pressure (psi)
J91	2.91	95	249.97	67.15
J86	2.91	90	245.58	67.41
J160	2.91	220	378.35	68.61
J156	2.91	220	378.35	68.61
J171	2.91	222	380.51	68.68
J191	2.91	85	244.65	69.18
J92	2.91	90	249.98	69.32
J163	2.91	219	379.06	69.35
J169	2.91	220	380.31	69.46
J122	2.91	220	380.89	69.71
J121	2.91	218	380.52	70.42
J162	2.91	215	379.13	71.12
J183	2.91	370	536.12	71.98
J170	2.91	215	381.41	72.11
J108	2.91	210	377.88	72.74
J111	2.91	210	377.88	72.74
J161	2.91	210	378.35	72.95
J155	2.91	210	378.35	72.95
J172	2.91	210	380.51	73.88
J125	2.91	208	379.13	74.15
J124	2.91	208	379.17	74.17
J109	2.91	205	377.88	74.91
J107	2.91	205	377.88	74.91
J128	2.91	205	377.88	74.91
J129	2.91	205	377.91	74.92
J127	2.91	205	378.33	75.1
J126	2.91	205	378.36	75.12

Static Pressures, 2033 Peak Hour Demand, results for der

Increased 2nd St to 8"

Increased Columbia St PRV settings to 32psi/3

Added Boege Rd/SR4 PRVs

Increased school line to 8"

ID	Demand (gpm)	Elevation (ft)	Head (ft)	Pressure (psi)
J156	2.91	220	372.74	66.18
J117	2.91	255	408.08	66.33
J163	2.91	219	373.94	67.14
J169	2.91	220	376.38	67.76
J119	2.91	250	407.79	68.37
J162	2.91	215	374.01	68.9
J91	2.91	95	256.3	69.89
J108	2.91	210	371.97	70.18
J111	2.91	210	371.97	70.18
J86	2.91	90	252.65	70.48
J161	2.91	210	372.74	70.52
J155	2.91	210	372.74	70.52
J118	2.91	243	408.01	71.5
J125	2.91	208	374.01	71.93
J124	2.91	208	374.09	71.96
J92	2.91	90	256.3	72.06
J191	2.91	85	251.72	72.24
J109	2.91	205	371.97	72.35
J107	2.91	205	371.97	72.35
J128	2.91	205	371.99	72.36
J129	2.91	205	372.04	72.38
J127	2.91	205	372.7	72.66
J126	2.91	205	372.75	72.68
J213	2.91	240	408.28	72.92
J123	2.91	205	374.83	73.59
J105	2.91	200	371.77	74.43
J106	2.91	200	371.97	74.51

Static Pressures, 2033 Peak Hour Demand, results for demand nodes only'

No CIPs

ID	Demand (gpm)	Elevation (ft)	Head (ft)	Pressure (psi)
J181	2.91	362	536.12	75.45
J123	2.91	205	379.65	75.67
J184	2.91	450	625.97	76.25
J192	2.91	360	536.12	76.31
J105	2.91	200	377.77	77.03
J110	2.91	200	377.88	77.07
J106	2.91	200	377.88	77.08
J166	2.91	198	379.89	78.81
J164	2.91	195	379.17	79.8
J175	2.91	440	625.59	80.42
J51	2.91	70	256.05	80.61
J52	2.91	70	256.09	80.63
J85	2.91	60	246.39	80.76
J190	2.91	70	256.92	80.99
J53	2.91	70	256.92	80.99
J130	2.91	190	377.69	81.33
J167	2.91	190	380.02	82.34
J176	2.91	435	625.59	82.58
J104	2.91	185	377.42	83.37
J135	2.91	183	377.43	84.25
J131	2.91	183	377.53	84.29
J168	2.91	185	380.32	84.63
J17	2.91	75	270.73	84.81
J137	2.91	180	377.43	85.55
J136	2.91	180	377.43	85.55
J50	2.91	58	255.57	85.61
J113	2.91	180	378.37	85.95

Static Pressures, 2033 Peak Hour Demand, results for der

Increased 2nd St to 8"

Increased Columbia St PRV settings to 32psi/3

Added Boege Rd/SR4 PRVs

Increased school line to 8"

ID	Demand (gpm)	Elevation (ft)	Head (ft)	Pressure (psi)
J110	2.91	200	371.97	74.51
J166	2.91	198	375.42	76.87
J164	2.91	195	374.08	77.6
J184	2.91	450	631.51	78.65
J130	2.91	190	371.72	78.74
J167	2.91	190	375.71	80.47
J104	2.91	185	371.13	80.65
J171	2.91	222	408.3	80.72
J135	2.91	183	371.3	81.59
J131	2.91	183	371.49	81.67
J122	2.91	220	408.71	81.77
J121	2.91	218	408.31	82.46
J51	2.91	70	260.48	82.54
J52	2.91	70	260.52	82.55
J175	2.91	440	630.88	82.71
J182	2.91	315	505.97	82.75
J190	2.91	70	261.13	82.81
J53	2.91	70	261.13	82.82
J137	2.91	180	371.36	82.91
J136	2.91	180	371.36	82.91
J168	2.91	185	376.38	82.93
J113	2.91	180	372.7	83.5
J112	2.91	180	372.81	83.54
J114	2.91	180	373.16	83.7
J85	2.91	60	253.3	83.76
J170	2.91	215	409.45	84.25
J176	2.91	435	630.88	84.88

Static Pressures, 2033 Peak Hour Demand, results for demand nodes only'

No CIPs

ID	Demand (gpm)	Elevation (ft)	Head (ft)	Pressure (psi)
J112	2.91	180	378.44	85.98
J114	2.91	180	378.7	86.1
J27	2.91	68	266.89	86.18
J76	2.91	50	250.5	86.88
J70	2.91	50	251.32	87.23
J69	2.91	50	251.46	87.29
J165	2.91	178	379.89	87.48
J75	2.91	48	250.1	87.57
J68	2.91	50	252.74	87.85
J84	2.91	45	247.83	87.89
J48	2.91	50	253.97	88.38
J49	2.91	50	254.03	88.4
J94	2.91	46	250.07	88.42
J93	2.91	45	250.07	88.86
J24	2.91	65	271.19	89.34
J35	2.91	58	264.55	89.5
J83	2.91	42	248.76	89.59
J141	2.91	170	377.43	89.88
J140	2.91	170	377.43	89.88
J139	2.91	170	377.43	89.88
J138	2.91	170	377.43	89.88
J67	2.91	45	252.74	90.01
J28	2.91	55	265.79	91.34
J142	2.91	165	377.43	92.04
J134	2.91	165	377.43	92.04
J133	2.91	165	377.52	92.09
J132	2.91	165	377.52	92.09

Static Pressures, 2033 Peak Hour Demand, results for der

Increased 2nd St to 8"

Increased Columbia St PRV settings to 32psi/3

Added Boege Rd/SR4 PRVs

Increased school line to 8"

ID	Demand (gpm)	Elevation (ft)	Head (ft)	Pressure (psi)
J17	2.91	75	271.12	84.98
J165	2.91	178	375.41	85.54
J172	2.91	210	408.3	85.92
J27	2.91	68	268.39	86.83
J141	2.91	170	371.35	87.25
J140	2.91	170	371.35	87.25
J139	2.91	170	371.35	87.25
J138	2.91	170	371.35	87.25
J50	2.91	58	260.11	87.58
J142	2.91	165	371.35	89.41
J134	2.91	165	371.35	89.41
J133	2.91	165	371.49	89.47
J132	2.91	165	371.49	89.47
J24	2.91	65	271.56	89.5
J76	2.91	50	256.57	89.51
J70	2.91	50	257.11	89.74
J69	2.91	50	257.21	89.78
J68	2.91	50	258.09	90.17
J75	2.91	48	256.32	90.26
J35	2.91	58	266.65	90.41
J48	2.91	50	258.95	90.54
J49	2.91	50	258.99	90.56
J84	2.91	45	254.45	90.75
J94	2.91	46	256.31	91.13
J93	2.91	45	256.31	91.56
J28	2.91	55	267.58	92.11
J67	2.91	45	258.09	92.33

Static Pressures, 2033 Peak Hour Demand, results for demand nodes only'

No CIPs

ID	Demand (gpm)	Elevation (ft)	Head (ft)	Pressure (psi)
J25	2.91	58	271.08	92.33
J34	2.91	50	264.85	93.09
J74	2.91	35	250	93.16
J73	2.91	35	250.03	93.17
J29	2.91	47	265.09	94.5
J47	2.91	35	253.98	94.88
J72	2.91	30	250.37	95.49
J174	2.91	405	625.59	95.58
J182	2.91	315	536.12	95.81
J64	2.91	30	251.6	96.02
J65	2.91	30	251.81	96.11
J45	2.91	32	253.99	96.19
J30	2.91	42	265.09	96.66
J66	2.91	30	253.49	96.84
J80	2.91	25	249.94	97.47
J211	2.91	30	255.43	97.68
J37	2.91	30	255.63	97.76
J185	2.91	400	625.97	97.91
J71	2.91	23	250.79	98.7
J26	2.91	43	271.01	98.8
J63	2.91	22	251.44	99.42
J23	2.91	40	270.99	100.09
J1	2.91	40	270.99	100.09
J2	2.91	40	270.99	100.09
J81	2.91	18	249.42	100.27
J82	2.91	15	249.13	101.45
J78	2.91	15	249.94	101.8

Static Pressures, 2033 Peak Hour Demand, results for der

Increased 2nd St to 8"

Increased Columbia St PRV settings to 32psi/3

Added Boege Rd/SR4 PRVs

Increased school line to 8"

ID	Demand (gpm)	Elevation (ft)	Head (ft)	Pressure (psi)
J83	2.91	42	255.2	92.38
J25	2.91	58	271.48	92.5
J34	2.91	50	266.87	93.97
J29	2.91	47	267.05	95.35
J74	2.91	35	256.21	95.85
J73	2.91	35	256.23	95.86
J47	2.91	35	258.96	97.04
J30	2.91	42	267.05	97.51
J174	2.91	405	630.88	97.87
J72	2.91	30	256.46	98.13
J45	2.91	32	258.97	98.34
J64	2.91	30	257.3	98.49
J65	2.91	30	257.44	98.55
J26	2.91	43	271.4	98.97
J66	2.91	30	258.61	99.06
J211	2.91	30	260.01	99.66
J37	2.91	30	260.15	99.72
J80	2.91	25	256.16	100.16
J23	2.91	40	271.37	100.25
J1	2.91	40	271.37	100.25
J2	2.91	40	271.37	100.25
J185	2.91	400	631.51	100.31
J71	2.91	23	256.74	101.28
J63	2.91	22	257.2	101.91
J81	2.91	18	255.73	103.01
J44	2.91	19	259.15	104.06
J82	2.91	15	255.5	104.21

Static Pressures, 2033 Peak Hour Demand, results for demand nodes only'

No CIPs

ID	Demand (gpm)	Elevation (ft)	Head (ft)	Pressure (psi)
J77	2.91	15	249.94	101.8
J44	2.91	19	254.28	101.95
J79	2.91	12	249.94	103.1
J46	2.91	14	254.21	104.08
J38	2.91	13	255.44	105.05
J4	2.91	27	270.79	105.64
J43	2.91	10	254.67	106.02
J39	2.91	10	255.39	106.33
J21	2.91	25	270.7	106.46
J14	2.91	25	270.71	106.47
J13	2.91	25	270.71	106.47
J11	2.91	25	270.71	106.47
J9	2.91	25	270.73	106.48
J19	2.91	25	270.73	106.48
J8	2.91	25	270.73	106.48
J196	2.91	25	270.77	106.49
J195	2.91	25	270.77	106.49
J7	2.91	25	270.77	106.49
J31	2.91	17	264.88	107.41
J32	2.91	17	265.09	107.5
J33	2.91	17	265.09	107.5
J40	2.91	6	255.3	108.02
J42	2.91	5	255.21	108.42
J41	2.91	5	255.28	108.45
J15	2.91	20	270.71	108.63
J18	2.91	20	270.71	108.63
J22	2.91	20	270.77	108.66

Static Pressures, 2033 Peak Hour Demand, results for der

Increased 2nd St to 8"

Increased Columbia St PRV settings to 32psi/3

Added Boege Rd/SR4 PRVs

Increased school line to 8"

ID	Demand (gpm)	Elevation (ft)	Head (ft)	Pressure (psi)
J78	2.91	15	256.16	104.49
J77	2.91	15	256.16	104.49
J79	2.91	12	256.16	105.79
J4	2.91	27	271.18	105.8
J46	2.91	14	259.08	106.19
J21	2.91	25	271.09	106.63
J14	2.91	25	271.1	106.63
J13	2.91	25	271.1	106.63
J11	2.91	25	271.1	106.64
J9	2.91	25	271.12	106.64
J19	2.91	25	271.12	106.64
J8	2.91	25	271.12	106.64
J7	2.91	25	271.15	106.66
J195	2.91	25	271.15	106.66
J196	2.91	25	271.15	106.66
J38	2.91	13	259.99	107.02
J173	2.91	257	504.96	107.44
J43	2.91	10	259.43	108.08
J31	2.91	17	266.84	108.26
J39	2.91	10	259.96	108.31
J32	2.91	17	267.05	108.35
J33	2.91	17	267.05	108.35
J15	2.91	20	271.09	108.8
J18	2.91	20	271.1	108.8
J22	2.91	20	271.15	108.82
J16	2.91	18	271.1	109.67
J6	2.91	18	271.13	109.68

Static Pressures, 2033 Peak Hour Demand, results for demand nodes only'

No CIPs

ID	Demand (gpm)	Elevation (ft)	Head (ft)	Pressure (psi)
J16	2.91	18	270.71	109.5
J6	2.91	18	270.74	109.51
J20	2.91	10	270.74	112.98
J5	2.91	10	270.77	112.99
J3	2.91	10	270.98	113.08
J173	2.91	257	535.5	120.68
J210	2.91	275	664.8	168.9
J188	2.91	240	669.22	185.98

Static Pressures, 2033 Peak Hour Demand, results for der

Increased 2nd St to 8"

Increased Columbia St PRV settings to 32psi/3

Added Boege Rd/SR4 PRVs

Increased school line to 8"

ID	Demand (gpm)	Elevation (ft)	Head (ft)	Pressure (psi)
J40	2.91	6	259.89	110.01
J42	2.91	5	259.82	110.41
J41	2.91	5	259.87	110.44
J20	2.91	10	271.12	113.14
J5	2.91	10	271.15	113.16
J3	2.91	10	271.36	113.25
J210	2.91	275	670.48	171.36
J188	2.91	240	674.75	188.38

Static Pressures, 2043 Peak Hour Demand, results for demand nodes only'
No CIP

ID	Demand (gpm)	Elevation (ft)	Head (ft)	Pressure (psi)
J97	6.51	185	248.12	27.35
J96	6.51	185	248.18	27.37
J143	6.51	170	244.34	32.21
J54	6.51	185	260.95	32.91
J56	6.51	185	261.36	33.09
J178	6.51	423	500.78	33.7
J120	6.51	283	366.44	36.15
J100	6.51	155	244.05	38.58
J99	6.51	155	244.05	38.58
J153	6.51	155	244.1	38.61
J148	6.51	150	244.03	40.74
J147	6.51	150	244.04	40.75
J98	6.51	150	244.07	40.76
J149	6.51	150	244.07	40.76
J180	6.51	405	500.71	41.47
J179	6.51	405	500.71	41.47
J95	6.51	145	243.4	42.64
J144	6.51	145	244.03	42.91
J146	6.51	145	244.03	42.91
J145	6.51	145	244.03	42.91
J151	6.51	145	244.03	42.91
J150	6.51	145	244.13	42.95
J87	6.51	140	243.01	44.63
J88	6.51	140	243.24	44.73

Static Pressures, 2043 Peak Hour Demand, results for demand nodes
Increased 2nd St to 8", increased school hydrant to 8"
Increased Columbia St PRV settings to 32psi/37psi
Added Boege Rd/SR4 PRVs
Added Kent's Bridge Res 2

ID	Demand (gpm)	Elevation (ft)	Head (ft)	Pressure (psi)
J97	6.51	185	256.95	31.17
J96	6.51	185	257.02	31.21
J178	6.51	423	500.64	33.64
J54	6.51	185	264.54	34.46
J56	6.51	185	264.88	34.61
J143	6.51	170	251.32	35.23
J180	6.51	405	500.58	41.41
J179	6.51	405	500.58	41.42
J153	6.51	155	251.2	41.68
J100	6.51	155	251.2	41.69
J99	6.51	155	251.21	41.69
J148	6.51	150	251.12	43.81
J147	6.51	150	251.12	43.81
J149	6.51	150	251.14	43.82
J98	6.51	150	251.45	43.96
J177	6.51	395	500.86	45.87
J95	6.51	145	250.91	45.89
J151	6.51	145	251.12	45.98
J144	6.51	145	251.12	45.98
J146	6.51	145	251.12	45.98
J145	6.51	145	251.12	45.98
J150	6.51	145	251.18	46.01
J57	6.51	155	264.87	47.61
J87	6.51	140	250.41	47.84

Static Pressures, 2043 Peak Hour Demand, results for demand nodes only'

No CIP

ID	Demand (gpm)	Elevation (ft)	Head (ft)	Pressure (psi)
J89	6.51	140	243.26	44.74
J152	6.51	140	244.02	45.07
J177	6.51	395	501	45.93
J57	6.51	155	261.36	46.08
J115	6.51	260	366.43	46.12
J116	6.51	260	366.44	46.12
J101	6.51	135	243.98	47.22
J212	6.51	135	243.98	47.22
J154	6.51	135	244.41	47.41
J189	6.51	143	252.51	47.45
J117	6.51	255	365.6	47.92
J59	6.51	225	336.91	48.49
J209	6.51	225	336.91	48.49
J193	6.51	132	244.41	48.71
J119	6.51	250	364.27	49.51
J36	6.51	137	253.85	50.63
J90	6.51	125	243.31	51.26
J102	6.51	125	243.83	51.49
J103	6.51	122	243.83	52.79
J118	6.51	243	365.29	52.99
J213	6.51	240	366.46	54.8
J159	6.51	225	355.27	56.45
J157	6.51	225	355.28	56.45
J158	6.51	225	355.28	56.45
J183	6.51	370	500.64	56.6
J160	6.51	220	355.27	58.61
J156	6.51	220	355.28	58.62
J181	6.51	362	500.65	60.08

Static Pressures, 2043 Peak Hour Demand, results for demand nodes

Increased 2nd St to 8", increased school hydrant to 8"

Increased Columbia St PRV settings to 32psi/37psi

Added Boege Rd/SR4 PRVs

Added Kent's Bridge Res 2

ID	Demand (gpm)	Elevation (ft)	Head (ft)	Pressure (psi)
J89	6.51	140	250.58	47.91
J88	6.51	140	250.59	47.92
J152	6.51	140	251.1	48.14
J59	6.51	225	336.91	48.49
J209	6.51	225	336.91	48.49
J120	6.51	283	394.96	48.51
J189	6.51	143	257.3	49.53
J101	6.51	135	251.1	50.3
J212	6.51	135	251.1	50.31
J154	6.51	135	251.37	50.42
J193	6.51	132	251.37	51.72
J36	6.51	137	258.39	52.6
J90	6.51	125	250.58	54.41
J102	6.51	125	250.95	54.58
J103	6.51	122	250.95	55.87
J183	6.51	370	500.5	56.55
J115	6.51	260	394.95	58.47
J116	6.51	260	394.96	58.48
J181	6.51	362	500.52	60.02
J159	6.51	225	364.05	60.25
J157	6.51	225	364.06	60.26
J158	6.51	225	364.06	60.26
J117	6.51	255	394.12	60.28
J192	6.51	360	500.52	60.89
J58	6.51	195	336.88	61.48
J119	6.51	250	392.79	61.87
J160	6.51	220	364.06	62.42
J156	6.51	220	364.07	62.42

Static Pressures, 2043 Peak Hour Demand, results for demand nodes only'

No CIP

ID	Demand (gpm)	Elevation (ft)	Head (ft)	Pressure (psi)
J163	6.51	219	359.05	60.68
J192	6.51	360	500.65	60.94
J58	6.51	195	336.88	61.48
J108	6.51	210	352.72	61.84
J111	6.51	210	352.72	61.84
J162	6.51	215	359.37	62.55
J171	6.51	222	366.54	62.63
J161	6.51	210	355.28	62.95
J155	6.51	210	355.29	62.95
J169	6.51	220	365.52	63.05
J55	6.51	190	336.87	63.64
J109	6.51	205	352.72	64.01
J107	6.51	205	352.72	64.01
J128	6.51	205	352.74	64.02
J129	6.51	205	352.9	64.09
J86	6.51	90	237.99	64.12
J91	6.51	95	243.37	64.29
J122	6.51	220	368.44	64.32
J121	6.51	218	366.59	64.38
J127	6.51	205	355.15	65.06
J126	6.51	205	355.3	65.13
J125	6.51	208	359.37	65.59
J191	6.51	85	236.6	65.69
J124	6.51	208	359.61	65.69
J105	6.51	200	352.09	65.9
J110	6.51	200	352.71	66.17
J106	6.51	200	352.72	66.17
J92	6.51	90	243.34	66.44

Static Pressures, 2043 Peak Hour Demand, results for demand nodes

Increased 2nd St to 8", increased school hydrant to 8"

Increased Columbia St PRV settings to 32psi/37psi

Added Boege Rd/SR4 PRVs

Added Kent's Bridge Res 2

ID	Demand (gpm)	Elevation (ft)	Head (ft)	Pressure (psi)
J55	6.51	190	336.87	63.64
J163	6.51	219	367.9	64.52
J118	6.51	243	393.81	65.35
J108	6.51	210	361.21	65.52
J111	6.51	210	361.21	65.52
J162	6.51	215	368.22	66.39
J169	6.51	220	373.31	66.43
J161	6.51	210	364.06	66.76
J155	6.51	210	364.08	66.76
J213	6.51	240	394.98	67.15
J86	6.51	90	245.28	67.28
J91	6.51	95	250.58	67.41
J109	6.51	205	361.21	67.69
J107	6.51	205	361.21	67.69
J128	6.51	205	361.23	67.7
J129	6.51	205	361.41	67.77
J191	6.51	85	243.89	68.85
J127	6.51	205	363.94	68.87
J126	6.51	205	364.09	68.93
J125	6.51	208	368.22	69.42
J124	6.51	208	368.46	69.53
J105	6.51	200	360.48	69.54
J92	6.51	90	250.53	69.56
J110	6.51	200	361.21	69.85
J106	6.51	200	361.22	69.85
J123	6.51	205	370.96	71.91
J130	6.51	190	360.1	73.7
J171	6.51	222	395.06	74.99

Static Pressures, 2043 Peak Hour Demand, results for demand nodes only'
No CIP

ID	Demand (gpm)	Elevation (ft)	Head (ft)	Pressure (psi)
J170	6.51	215	371.14	67.65
J172	6.51	210	366.54	67.83
J123	6.51	205	362.07	68.06
J130	6.51	190	351.75	70.08
J164	6.51	195	359.61	71.32
J104	6.51	185	350.06	71.52
J166	6.51	198	363.34	71.64
J135	6.51	183	350.32	72.5
J131	6.51	183	350.9	72.75
J137	6.51	180	350.41	73.84
J136	6.51	180	350.41	73.84
J167	6.51	190	364.01	75.4
J184	6.51	450	624.33	75.54
J113	6.51	180	355.34	75.98
J112	6.51	180	355.71	76.14
J114	6.51	180	357.06	76.72
J85	6.51	60	238.79	77.47
J51	6.51	70	248.88	77.51
J52	6.51	70	248.96	77.54
J190	6.51	70	249.98	77.99
J53	6.51	70	249.99	77.99
J141	6.51	170	350.39	78.16
J140	6.51	170	350.39	78.16
J139	6.51	170	350.39	78.16
J138	6.51	170	350.4	78.17
J168	6.51	185	365.53	78.22
J175	6.51	440	622.61	79.12
J165	6.51	178	363.34	80.31

Static Pressures, 2043 Peak Hour Demand, results for demand nodes
Increased 2nd St to 8", increased school hydrant to 8"
Increased Columbia St PRV settings to 32psi/37psi
Added Boege Rd/SR4 PRVs
Added Kent's Bridge Res 2

ID	Demand (gpm)	Elevation (ft)	Head (ft)	Pressure (psi)
J104	6.51	185	358.08	74.99
J164	6.51	195	368.46	75.16
J166	6.51	198	371.81	75.31
J184	6.51	450	624.36	75.55
J135	6.51	183	358.44	76.02
J131	6.51	183	359.13	76.32
J121	6.51	218	395.11	76.74
J122	6.51	220	397.6	76.95
J137	6.51	180	358.57	77.37
J136	6.51	180	358.57	77.38
J167	6.51	190	372.26	78.97
J175	6.51	440	622.32	79
J113	6.51	180	364.3	79.86
J51	6.51	70	254.5	79.95
J52	6.51	70	254.57	79.98
J112	6.51	180	364.73	80.05
J172	6.51	210	395.06	80.19
J190	6.51	70	255.42	80.34
J53	6.51	70	255.42	80.34
J182	6.51	315	500.51	80.38
J170	6.51	215	400.65	80.44
J85	6.51	60	246.03	80.61
J114	6.51	180	366.37	80.76
J176	6.51	435	622.33	81.17
J168	6.51	185	373.31	81.6
J141	6.51	170	358.55	81.7
J140	6.51	170	358.55	81.7
J139	6.51	170	358.55	81.7

Static Pressures, 2043 Peak Hour Demand, results for demand nodes only'

No CIP

ID	Demand (gpm)	Elevation (ft)	Head (ft)	Pressure (psi)
J142	6.51	165	350.39	80.33
J134	6.51	165	350.39	80.33
J182	6.51	315	500.64	80.44
J133	6.51	165	350.89	80.55
J132	6.51	165	350.9	80.55
J176	6.51	435	622.62	81.29
J17	6.51	75	264.69	82.19
J50	6.51	58	248.07	82.36
J27	6.51	68	261.3	83.76
J76	6.51	50	243.34	83.77
J70	6.51	50	243.86	84
J69	6.51	50	243.96	84.04
J68	6.51	50	245.05	84.52
J75	6.51	48	243.11	84.54
J84	6.51	45	240.29	84.62
J48	6.51	50	246.21	85.02
J49	6.51	50	246.27	85.05
J94	6.51	46	243.14	85.42
J93	6.51	45	243.14	85.85
J83	6.51	42	241.31	86.36
J67	6.51	45	245.05	86.68
J35	6.51	58	258.37	86.82
J24	6.51	65	266.58	87.35
J28	6.51	55	260.07	88.86
J74	6.51	35	242.82	90.05
J73	6.51	35	242.84	90.06
J25	6.51	58	266.37	90.29
J34	6.51	50	258.74	90.45

Static Pressures, 2043 Peak Hour Demand, results for demand nodes

Increased 2nd St to 8", increased school hydrant to 8"

Increased Columbia St PRV settings to 32psi/37psi

Added Boege Rd/SR4 PRVs

Added Kent's Bridge Res 2

ID	Demand (gpm)	Elevation (ft)	Head (ft)	Pressure (psi)
J138	6.51	170	358.55	81.7
J17	6.51	75	266.93	83.16
J142	6.51	165	358.55	83.86
J134	6.51	165	358.55	83.87
J165	6.51	178	371.8	83.98
J133	6.51	165	359.13	84.11
J132	6.51	165	359.13	84.12
J50	6.51	58	253.75	84.82
J27	6.51	68	264.5	85.14
J76	6.51	50	250.26	86.77
J70	6.51	50	250.63	86.93
J69	6.51	50	250.7	86.96
J68	6.51	50	251.54	87.33
J75	6.51	48	250.1	87.57
J84	6.51	45	247.42	87.71
J48	6.51	50	252.47	87.73
J49	6.51	50	252.51	87.75
J24	6.51	65	268.81	88.31
J35	6.51	58	262.08	88.43
J94	6.51	46	250.16	88.46
J93	6.51	45	250.16	88.9
J83	6.51	42	248.38	89.42
J67	6.51	45	251.54	89.5
J28	6.51	55	263.51	90.35
J25	6.51	58	268.62	91.26
J34	6.51	50	262.38	92.03
J74	6.51	35	249.8	93.07
J73	6.51	35	249.81	93.08

Static Pressures, 2043 Peak Hour Demand, results for demand nodes only'

No CIP

ID	Demand (gpm)	Elevation (ft)	Head (ft)	Pressure (psi)
J47	6.51	35	246.21	91.52
J29	6.51	47	259.04	91.88
J72	6.51	30	243.07	92.32
J64	6.51	30	244.04	92.74
J65	6.51	30	244.21	92.82
J45	6.51	32	246.22	92.82
J66	6.51	30	245.73	93.47
J30	6.51	42	259.04	94.04
J174	6.51	405	622.61	94.29
J80	6.51	25	242.73	94.34
J211	6.51	30	247.84	94.39
J37	6.51	30	248.07	94.49
J71	6.51	23	243.38	95.49
J63	6.51	22	243.93	96.16
J26	6.51	43	266.01	96.63
J81	6.51	18	242.08	97.1
J185	6.51	400	624.33	97.2
J23	6.51	40	265.75	97.82
J1	6.51	40	265.76	97.82
J2	6.51	40	265.76	97.82
J82	6.51	15	241.74	98.25
J44	6.51	19	246.37	98.52
J78	6.51	15	242.73	98.67
J77	6.51	15	242.73	98.67
J79	6.51	12	242.73	99.97
J46	6.51	14	246.03	100.54
J38	6.51	13	247.71	101.7
J43	6.51	10	246.75	102.58

Static Pressures, 2043 Peak Hour Demand, results for demand nodes

Increased 2nd St to 8", increased school hydrant to 8"

Increased Columbia St PRV settings to 32psi/37psi

Added Boege Rd/SR4 PRVs

Added Kent's Bridge Res 2

ID	Demand (gpm)	Elevation (ft)	Head (ft)	Pressure (psi)
J29	6.51	47	262.63	93.43
J174	6.51	405	622.32	94.17
J47	6.51	35	252.48	94.23
J72	6.51	30	249.99	95.32
J45	6.51	32	252.5	95.54
J30	6.51	42	262.63	95.6
J64	6.51	30	250.76	95.65
J65	6.51	30	250.89	95.71
J66	6.51	30	252.1	96.24
J211	6.51	30	253.57	96.87
J37	6.51	30	253.73	96.94
J185	6.51	400	624.35	97.21
J80	6.51	25	249.71	97.37
J26	6.51	43	268.25	97.6
J71	6.51	23	250.23	98.46
J23	6.51	40	267.99	98.79
J1	6.51	40	267.99	98.79
J2	6.51	40	267.99	98.79
J63	6.51	22	250.67	99.08
J81	6.51	18	249.1	100.14
J44	6.51	19	252.52	101.18
J82	6.51	15	248.78	101.3
J78	6.51	15	249.71	101.7
J77	6.51	15	249.71	101.7
J79	6.51	12	249.71	103
J46	6.51	14	252.18	103.2
J173	6.51	257	496.52	103.78
J38	6.51	13	253.19	104.07

Static Pressures, 2043 Peak Hour Demand, results for demand nodes only'

No CIP

ID	Demand (gpm)	Elevation (ft)	Head (ft)	Pressure (psi)
J39	6.51	10	247.63	102.97
J4	6.51	27	264.97	103.11
J21	6.51	25	264.57	103.8
J14	6.51	25	264.6	103.82
J13	6.51	25	264.61	103.82
J11	6.51	25	264.61	103.83
J9	6.51	25	264.7	103.86
J19	6.51	25	264.7	103.86
J8	6.51	25	264.7	103.86
J196	6.51	25	264.85	103.92
J195	6.51	25	264.85	103.92
J7	6.51	25	264.85	103.92
J173	6.51	257	497.46	104.19
J31	6.51	17	258.12	104.48
J40	6.51	6	247.49	104.64
J32	6.51	17	259.04	104.87
J33	6.51	17	259.04	104.87
J42	6.51	5	247.36	105.02
J41	6.51	5	247.45	105.06
J15	6.51	20	264.59	105.98
J18	6.51	20	264.6	105.99
J22	6.51	20	264.85	106.09
J16	6.51	18	264.6	106.85
J6	6.51	18	264.73	106.91
J20	6.51	10	264.71	110.37
J5	6.51	10	264.85	110.43
J3	6.51	10	265.71	110.8
J210	6.51	275	666.51	169.64

Static Pressures, 2043 Peak Hour Demand, results for demand nodes

Increased 2nd St to 8", increased school hydrant to 8"

Increased Columbia St PRV settings to 32psi/37psi

Added Boege Rd/SR4 PRVs

Added Kent's Bridge Res 2

ID	Demand (gpm)	Elevation (ft)	Head (ft)	Pressure (psi)
J4	6.51	27	267.2	104.08
J21	6.51	25	266.8	104.77
J14	6.51	25	266.84	104.79
J13	6.51	25	266.85	104.79
J11	6.51	25	266.85	104.79
J9	6.51	25	266.94	104.83
J19	6.51	25	266.94	104.83
J8	6.51	25	266.94	104.83
J196	6.51	25	267.08	104.89
J195	6.51	25	267.08	104.89
J7	6.51	25	267.08	104.89
J43	6.51	10	252.55	105.1
J39	6.51	10	253.06	105.32
J31	6.51	17	261.71	106.03
J33	6.51	17	262.63	106.43
J32	6.51	17	262.63	106.43
J40	6.51	6	252.82	106.95
J15	6.51	20	266.83	106.95
J18	6.51	20	266.84	106.96
J22	6.51	20	267.09	107.06
J42	6.51	5	252.59	107.28
J41	6.51	5	252.76	107.36
J16	6.51	18	266.84	107.82
J6	6.51	18	266.96	107.88
J20	6.51	10	266.95	111.34
J5	6.51	10	267.09	111.4
J3	6.51	10	267.94	111.77
J210	6.51	275	668.23	170.39

Static Pressures, 2043 Peak Hour Demand, results for demand nodes only'

No CIP

ID	Demand (gpm)	Elevation (ft)	Head (ft)	Pressure (psi)
J188	6.51	240	670.52	186.54

Static Pressures, 2043 Peak Hour Demand, results for demand nodes

Increased 2nd St to 8", increased school hydrant to 8"

Increased Columbia St PRV settings to 32psi/37psi

Added Boege Rd/SR4 PRVs

Added Kent's Bridge Res 2

ID	Demand (gpm)	Elevation (ft)	Head (ft)	Pressure (psi)
J188	6.51	240	672.24	187.29

2023 Existing MDD plus FF

ID	Total Demand (gpm)	Hydrant Available Flow (gpm)	Critical Node ID for Design Run	Critical Node Pressure at Available Flow (psi)	Critical Node Pressure at Fire Demand (psi)	Critical Pressure for Design Run (psi)	Hydrant Design Flow (gpm)	Hydrant Pressure at Design Flow (psi)	
J148	1,001.01	851.13	J148	20	12.19	20	851	20	near school
J19	501.01	1,095.41	J17	-1.67	10.49	20	924	41.75	outside Town Limits
J58	501.01	928.32	J58	20	13.79	20	928	20	outside Town Limits
J18	501.01	944.87	J18	20	10.83	20	945	20	outside Town Limits
J20	501.01	1,238.10	J17	-5.33	21.6	20	1,016.48	46.25	
J189	1,001.01	1,024.95	J189	20	21.15	20	1,024.95	20	
J36	1,001.01	1,057.90	J36	20	22.88	20	1,057.90	20	
J22	501.01	1,296.61	J17	-2.78	27.77	20	1,085.20	43.56	
J97	1,001.01	1,198.85	J97	20	24.37	20	1,181.38	20	
J43	1,501.01	1,201.25	J43	20	-22.64	20	1,201	20	2nd St
J27	501.01	1,258.27	J27	20	40.88	20	1,258.27	20	
J143	1,001.01	1,370.03	J143	20	27.31	20	1,370.03	20	
J3	501.01	1,557.23	J17	5.57	45.8	20	1,379.52	38.64	
J158	501.01	1,386.38	J158	20	35.97	20	1,386.29	20.51	
J23	501.01	1,443.91	J17	16.49	46.59	20	1,398.34	25.67	
J95	1,001.01	1,636.14	J97	13.34	26.59	20	1,406.42	32.49	
J134	1,001.01	1,418.40	J134	20	49.09	20	1,418.38	20.64	
J149	1,001.01	1,438.64	J149	20	31.19	20	1,438.64	20	
J34	501.01	1,801.79	J36	5	34.33	20	1,441.72	45.3	
J33	501.01	1,730.14	J36	9.91	34.95	20	1,475.15	44.55	
J32	501.01	1,729.36	J36	9.94	34.95	20	1,475.15	44.5	
J26	501.01	1,501.72	J17	19.39	50.17	20	1,493.11	22.63	

2023 Existing MDD plus FF

ID	Total Demand (gpm)	Hydrant Available Flow (gpm)	Critical Node ID for Design Run	Critical Node Pressure at Available Flow (psi)	Critical Node Pressure at Fire Demand (psi)	Critical Pressure for Design Run (psi)	Hydrant Design Flow (gpm)	Hydrant Pressure at Design Flow (psi)
J89	1,001.01	1,547.70	J97	19.48	26.82	20	1,503.47	28.58
J193	1,001.01	1,551.38	J193	20	37.29	20	1,551.38	20
J85	1,501.01	1,836.74	J97	11.93	21.03	20	1,563.64	34.63
J113	1,001.01	2,145.11	J120	11.88	25.93	20	1,569.81	44.95
J105	1,001.01	1,741.35	J120	17.84	25.95	20	1,572.59	29.14
J111	1,001.01	1,585.67	J120	19.85	25.95	20	1,573.12	21.96
J135	1,001.01	1,778.37	J120	17.35	25.95	20	1,573.17	32.2
J139	1,001.01	1,729.89	J120	18	25.95	20	1,573.21	31.11
J132	1,001.01	1,666.44	J120	18.83	25.95	20	1,573.33	27.98
J129	1,001.01	1,753.95	J120	17.7	25.96	20	1,574.58	29.1
J126	1,001.01	1,874.89	J120	16.14	25.99	20	1,581.00	32.91
J90	1,001.01	1,644.83	J97	18.75	26.9	20	1,587.22	32.93
J124	1,001.01	1,925.72	J120	15.97	26.16	20	1,613.17	32.99
J51	1,001.01	2,471.70	J54	5.88	25.97	20	1,625.50	55.73
J92	1,001.01	2,140.89	J97	4.46	26.99	20	1,625.71	53.01
J99	1,001.01	1,628.27	J99	20	33.05	20	1,628.27	20
J102	1,001.01	1,936.04	J97	12.19	27.08	20	1,633.26	40.05
J212	1,001.01	1,813.59	J97	16.34	27.14	20	1,636.83	35.02
J40	1,501.01	1,640.94	J40	20	33.01	20	1,640.94	20
J145	1,001.01	1,746.39	J97	18.89	27.15	20	1,646.79	31.16
J84	1,501.01	1,854.24	J97	13.7	22.29	20	1,652.46	26.47
J152	1,001.01	1,771.48	J97	18.57	27.13	20	1,656.77	32.09

2023 Existing MDD plus FF

ID	Total Demand (gpm)	Hydrant Available Flow (gpm)	Critical Node ID for Design Run	Critical Node Pressure at Available Flow (psi)	Critical Node Pressure at Fire Demand (psi)	Critical Pressure for Design Run (psi)	Hydrant Design Flow (gpm)	Hydrant Pressure at Design Flow (psi)
J81	1,501.01	2,240.49	J97	2.52	24.28	20	1,673.54	28.6
J167	1,501.01	2,297.28	J120	12.05	22.05	20	1,698.34	42.39
J77	1,501.01	2,424.37	J97	-2.9	24.84	20	1,699.46	29.78
J73	1,501.01	2,339.67	J97	0.84	24.93	20	1,704.77	21.25
J39	1,501.01	1,783.50	J39	20	43.01	20	1,783.50	20
J70	1,501.01	2,196.35	J97	8.68	25.74	20	1,809.91	47.3
J65	1,501.01	1,944.83	J97	17.91	26.41	20	1,850.60	33.51
J211	1,501.01	2,190.96	J189	8.33	28.75	20	1,881.25	44.35
J66	1,501.01	1,907.86	J66	20	48.2	20	1,907.86	20
J83	1,501.01	1,958.98	J83	20	50.42	20	1,953.74	20
J49	1,501.01	2,295.43	J54	15.03	24.38	20	1,966.84	38.48
J210	501.01	2,015.89	J210	20	127.97	20	2,013.53	20
J71	1,501.01	2,073.60	J71	20	58.52	20	2,068.09	20
J72	1,501.01	2,104.08	J72	20	58.63	20	2,098.84	20
J76	1,501.01	2,178.05	J76	20	57.31	20	2,171.33	20
J94	1,501.01	2,179.32	J94	20	58.61	20	2,172.53	20
J170	501.01	3,182.60	J120	-9.48	28.63	20	2,992.04	52.86
J68	1,501.01	1,951.28	J96	18.79	26.55			

2033 10 year MDD plus FF
No CIPs

ID	Total Demand (gpm)	Hydrant Available Flow (gpm)	Critical Node ID for Design Run	Critical Node Pressure at Available Flow (psi)	Critical Node Pressure at Fire Demand (psi)	Critical Pressure for Design Run (psi)	Hydrant Design Flow (gpm)	Hydrant Pressure at Design Flow (psi)
J148	1,001.30	833.91	J148	20	11.27	20	833.91	20
J19	501.30	1,074.43	J17	-1.67	7.72	20	902.87	41.9
J18	501.30	927.62	J18	20	8.01	20	927.62	20
J58	501.30	927.91	J58	20	13.73	20	927.91	20
J20	501.30	1,215.54	J17	-5.42	18.85	20	990.28	46.25
J189	1,001.30	991.48	J189	20	19.53	20	991.48	20
J36	1,001.30	1,025.58	J36	20	21.22	20	1,025.58	20
J22	501.30	1,271.86	J17	-2.81	25.06	20	1,055.82	43.38
J97	1,001.30	1,188.85	J97	20	24	20	1,188.85	20
J43	1,501.30	1,189.03	J43	20	-24.37	20	1,189.02	20
J27	501.30	1,236.45	J27	20	38.93	20	1,236.45	20
J3	501.30	1,530.05	J17	5	43.18	20	1,343.21	37.9
J23	501.30	1,414.81	J17	15.93	43.98	20	1,361.53	24.86
J34	501.30	1,772.60	J36	4.53	32.88	20	1,396.86	43.55
J143	1,001.30	1,399.37	J143	20	26.88	20	1,397.69	20.19
J149	1,001.30	1,419.85	J149	20	30.27	20	1,419.84	20
J33	501.30	1,707.08	J36	9.12	33.5	20	1,429.03	42.55
J32	501.30	1,706.32	J36	9.15	33.5	20	1,429.03	42.5
J51	1,001.30	2,456.11	J54	4.52	24.03	20	1,440.80	57.07
J134	1,001.30	1,451.47	J134	20	53.85	20	1,451.47	20
J26	501.30	1,471.63	J17	18.73	47.59	20	1,453.92	21.57
J158	501.30	1,476.09	J158	20	41.54	20	1,476.09	20

2033 10 year MDD plus FF
No CIPs

ID	Total Demand (gpm)	Hydrant Available Flow (gpm)	Critical Node ID for Design Run	Critical Node Pressure at Available Flow (psi)	Critical Node Pressure at Fire Demand (psi)	Critical Pressure for Design Run (psi)	Hydrant Design Flow (gpm)	Hydrant Pressure at Design Flow (psi)
J89	1,001.30	1,526.74	J89	20	35.36	20	1,523.07	20.07
J193	1,001.30	1,538.21	J193	20	36.29	20	1,538.21	20
J85	1,501.30	1,818.12	J97	12.99	21.4	20	1,561.66	36.13
J99	1,001.30	1,596.59	J99	20	32.24	20	1,596.59	20
J90	1,001.30	1,625.56	J97	19.42	26.71	20	1,604.50	20.93
J95	1,001.30	1,615.42	J95	20	36.82	20	1,612.18	20
J40	1,501.30	1,622.30	J40	20	31.29	20	1,622.30	20
J111	1,001.30	1,646.80	J111	20	49.19	20	1,646.80	20
J83	1,501.30	1,948.17	J97	12.31	23.57	20	1,650.91	39.61
J92	1,001.30	2,134.10	J97	5.36	26.8	20	1,654.55	42.81
J132	1,001.30	1,673.44	J132	20	62.21	20	1,673.44	20
J102	1,001.30	1,939.56	J97	12.91	26.89	20	1,688.03	30.08
J212	1,001.30	1,812.47	J97	16.87	26.93	20	1,700.05	24.64
J211	1,501.30	2,177.70	J54	14.93	21.84	20	1,722.34	46.53
J39	1,501.30	1,764.40	J54	19.61	21.84	20	1,722.59	22.95
J145	1,001.30	1,743.98	J97	19.48	26.95	20	1,725.78	20.59
J152	1,001.30	1,760.63	J151	18.91	36.04	20	1,730.75	21.01
J77	1,501.30	2,411.66	J97	-1.93	24.87	20	1,749.23	61.79
J94	1,501.30	2,169.75	J97	7.17	24.95	20	1,754.84	46.05
J73	1,501.30	2,326.88	J97	1.82	24.96	20	1,756.26	54.23
J126	1,001.30	1,950.25	J159	11.33	47.08	20	1,757.54	28.84
J49	1,501.30	2,281.67	J54	13.49	22.34	20	1,768.63	47.37

2033 10 year MDD plus FF
No CIPs

ID	Total Demand (gpm)	Hydrant Available Flow (gpm)	Critical Node ID for Design Run	Critical Node Pressure at Available Flow (psi)	Critical Node Pressure at Fire Demand (psi)	Critical Pressure for Design Run (psi)	Hydrant Design Flow (gpm)	Hydrant Pressure at Design Flow (psi)
J70	1,501.30	2,187.83	J97	9.76	26.05	20	1,772.19	44.32
J72	1,501.30	2,093.16	J97	11.09	25.27	20	1,778.12	42.18
J76	1,501.30	2,165.99	J97	8.89	25.36	20	1,779.76	42.82
J71	1,501.30	2,063.40	J97	12.52	25.5	20	1,788.88	39.55
J139	1,001.30	1,804.75	J139	20	62.31	20	1,804.74	20
J105	1,001.30	1,807.18	J105	20	54.42	20	1,807.18	20
J129	1,001.30	1,816.97	J129	20	53.69	20	1,812.86	20.27
J66	1,501.30	1,893.44	J54	19.27	22.73	20	1,816.15	26.1
J84	1,501.30	1,835.36	J84	20	42.87	20	1,835.36	20
J68	1,501.30	1,931.92	J54	19.04	23	20	1,840.87	25.78
J65	1,501.30	1,926.41	J54	19.56	23.44	20	1,889.83	23.46
J113	1,001.30	2,318.22	J159	8.18	49.15	20	1,907.29	34.25
J135	1,001.30	1,925.30	J135	20	59.66	20	1,925.30	20
J124	1,001.30	2,044.86	J163	15.71	51.83	20	1,936.27	24.54
J81	1,501.30	2,229.01	J54	16.52	24.38	20	1,984.34	38.5
J210	501.30	2,001.38	J210	20	126.15	20	2,001.38	20
J167	1,501.30	2,439.40	J120	16.75	29.64	20	2,213.04	29.29
J170	501.30	3,111.40	J178	-1.72	33.67	20	2,605.74	56.07

2033 10 year MDD plus FF

Increased 2nd St to 8"

Increased Columbia St PRV settings to 32psi/37psi

Added Boege Rd/SR4 PRVs

Increased school line to 8"

ID	Total Demand (gpm)	Hydrant Available Flow (gpm)	Critical Node ID for Design Run	Critical Node Pressure at Available Flow (psi)	Critical Node Pressure at Fire Demand (psi)	Critical Pressure for Design Run (psi)	Hydrant Design Flow (gpm)	Hydrant Pressure at Design Flow (psi)
J19	501.30	1,077.37	J17	-1.67	57.11	20	902	41.69
J58	501.30	927.91	J58	20	48.19	20	928	20
J18	501.30	930.07	J18	20	74.34	20	930	20
J20	501.30	1,218.70	J17	-5.4	60.22	20	994	46.31
J189	1,001.30	1,012.75	J189	20	20.54	20	1013	20
J36	1,001.30	1,043.47	J36	20	22.09	20	1,043.47	20
J22	501.30	1,275.36	J17	-2.81	61.98	20	1,059.05	43.16
J27	501.30	1,244.12	J27	20	68.73	20	1,244.12	20
J148	1,001.30	1,256.77	J148	20	27.86	20	1,256.77	20
J97	1,001.30	1,258.25	J97	20	24.77	20	1,257.33	20
J3	501.30	1,534.09	J17	5.06	67.11	20	1,349.40	37.97
J23	501.30	1,419.19	J17	16	67.34	20	1,367.85	24.94
J34	501.30	1,786.27	J36	5.24	45.59	20	1,426.34	42.89
J33	501.30	1,717.20	J36	9.95	45.77	20	1,459.39	41.38
J32	501.30	1,716.43	J36	9.98	45.77	20	1,459.39	41.33
J26	501.30	1,476.34	J17	18.8	68.38	20	1,460.83	21.67
J149	1,001.30	1,460.84	J149	20	31.7	20	1,460.84	20
J134	1,001.30	1,468.44	J134	20	46.77	20	1,465.43	20
J51	1,001.30	2,502.41	J54	4.59	24.49	20	1,491.26	56.98
J143	1,001.30	1,504.22	J143	20	27.76	20	1,502.16	20.14
J95	1,001.30	1,657.15	J97	14.73	29.87	20	1,531.04	25.32
J158	501.30	1,554.26	J158	20	57.31	20	1,554.26	20

2033 10 year MDD plus FF

Increased 2nd St to 8"

Increased Columbia St PRV settings to 32psi/37psi

Added Boege Rd/SR4 PRVs

Increased school line to 8"

ID	Total Demand (gpm)	Hydrant Available Flow (gpm)	Critical Node ID for Design Run	Critical Node Pressure at Available Flow (psi)	Critical Node Pressure at Fire Demand (psi)	Critical Pressure for Design Run (psi)	Hydrant Design Flow (gpm)	Hydrant Pressure at Design Flow (psi)
J193	1,001.30	1,568.63	J193	20	37.68	20	1,568.63	20
J89	1,001.30	1,576.27	J89	20	37.13	20	1,575.18	20
J99	1,001.30	1,665.92	J99	20	33.8	20	1,663.77	20
J90	1,001.30	1,670.45	J90	20	42.17	20	1,670.45	20
J111	1,001.30	1,683.02	J111	20	49.36	20	1,680.60	20.01
J85	1,501.30	1,851.96	J97	15.5	24.41	20	1,690.24	30.84
J84	1,501.30	1,868.65	J97	17.23	25.49	20	1,744.26	28.53
J211	1,501.30	2,205.22	J54	14.93	22.34	20	1,773.78	46.13
J39	1,501.30	2,157.58	J54	15.59	22.4	20	1,777.38	46.42
J40	1,501.30	2,175.28	J54	15.4	22.44	20	1,780.68	47.72
J152	1,001.30	1,817.84	J151	18.97	37.48	20	1,782.55	20.96
J43	1,501.30	2,366.07	J54	13.02	22.57	20	1,792.44	55.51
J81	1,501.30	2,296.93	J97	7.09	26.74	20	1,797.42	51.78
J49	1,501.30	2,344.74	J54	13.44	22.71	20	1,800.59	47.74
J132	1,001.30	1,801.13	J132	20	61.63	20	1,800.93	20.01
J126	1,001.30	2,120.55	J159	11.33	50.32	20	1,804.72	28.77
J145	1,001.30	1,807.76	J145	20	37.76	20	1,807.76	20
J83	1,501.30	1,987.22	J97	15.28	26.24	20	1,815.93	31.3
J102	1,001.30	2,034.59	J97	15.29	30.47	20	1,816.72	27.36
J212	1,001.30	1,896.44	J97	19.17	30.52	20	1,848.92	21.36
J66	1,501.30	1,955.50	J54	18.88	23.1	20	1,850.45	27.94
J77	1,501.30	2,489.89	J97	1.5	27.31	20	1,879.01	57.82

2033 10 year MDD plus FF

Increased 2nd St to 8"

Increased Columbia St PRV settings to 32psi/37psi

Added Boege Rd/SR4 PRVs

Increased school line to 8"

ID	Total Demand (gpm)	Hydrant Available Flow (gpm)	Critical Node ID for Design Run	Critical Node Pressure at Available Flow (psi)	Critical Node Pressure at Fire Demand (psi)	Critical Pressure for Design Run (psi)	Hydrant Design Flow (gpm)	Hydrant Pressure at Design Flow (psi)
J68	1,501.30	1,970.73	J54	19.03	23.37	20	1,880.09	26.16
J76	1,501.30	2,252.55	J96	12.68	28.03	20	1,923.15	38.46
J71	1,501.30	2,113.95	J97	15.77	28.14	20	1,930.67	33.44
J65	1,501.30	1,968.57	J54	19.68	23.82	20	1,933.37	22.11
J139	1,001.30	1,947.83	J139	20	55.23	20	1,947.74	20.06
J70	1,501.30	2,266.31	J54	16.9	24.15	20	1,980.82	36.02
J129	1,001.30	1,992.96	J129	20	55.85	20	1,992.96	20
J210	501.30	2,000.06	J210	20	147.42	20	2,000.06	20
J72	1,501.30	2,154.10	J54	18.83	24.49	20	2,026.50	28.47
J105	1,001.30	2,029.23	J105	20	54.04	20	2,029.23	20
J124	1,001.30	2,132.82	J163	15.65	56.31	20	2,040.36	24.22
J73	1,501.30	2,406.90	J54	15.12	24.62	20	2,041.18	42.41
J94	1,501.30	2,242.75	J54	17.72	24.65	20	2,044.40	32.27
J92	1,001.30	2,225.39	J99	14.49	37.47	20	2,093.42	27.28
J113	1,001.30	2,548.23	J159	9.64	52.8	20	2,123.86	32.61
J135	1,001.30	2,132.56	J135	20	58.72	20	2,131.87	20
J167	1,501.30	2,320.78	J178	17.28	33.12	20	2,273.96	26.84
J170	501.30	2,938.65	J120	-9.7	50.64	20	2,447.76	49.25

2043 20 year MDD plus FF
No CIP

ID	Total Demand (gpm)	Hydrant Available Flow (gpm)	Critical Node ID for Design Run	Critical Node Pressure at Available Flow (psi)	Critical Node Pressure at Fire Demand (psi)	Critical Pressure for Design Run (psi)	Hydrant Design Flow (gpm)	Hydrant Pressure at Design Flow (psi)
J148	1,001.63	811.55	J148	20	10.11	20	811.55	20
J19	501.63	1,050.35	J17	-1.67	53.9	20	871.4	41.7
J18	501.63	907.64	J18	20	71.1	20	907.64	20
J58	501.63	927.45	J58	20	48.15	20	927.45	20
J189	1,001.63	951.03	J189	20	17.6	20	951.03	20
J20	501.63	1,189.96	J17	-5.51	57.02	20	960.28	46.44
J36	1,001.63	986.64	J36	20	19.25	20	986.64	20
J22	501.63	1,243.88	J17	-2.86	58.81	20	1,022.99	43.23
J97	1,001.63	1,082.48	J97	20	21.75	20	1,082.48	20
J43	1,501.63	1,174.55	J43	20	-26.48	20	1,174.55	20
J27	501.63	1,210.49	J27	20	65.62	20	1,210.49	20
J51	1,001.63	2,372.01	J54	2.92	21.82	20	1,211.42	60.62
J3	501.63	1,499.71	J17	4.37	63.99	20	1,303.23	38.82
J134	1,001.63	1,307.28	J134	20	46.42	20	1,307.28	20
J95	1,001.63	1,523.19	J97	13.58	26.12	20	1,313.20	27.27
J23	501.63	1,382.09	J17	15.32	64.23	20	1,321.09	25.8
J143	1,001.63	1,326.76	J143	20	26.3	20	1,326.76	20
J158	501.63	1,343.25	J158	20	53.42	20	1,343.18	20
J34	501.63	1,738.81	J36	3.97	42.29	20	1,345.92	44.54
J149	1,001.63	1,355.12	J149	20	29.1	20	1,353.10	20.16
J33	501.63	1,680.40	J36	8.17	42.46	20	1,376.96	44.71
J32	501.63	1,679.65	J36	8.2	42.46	20	1,376.96	44.67

2043 20 year MDD plus FF
No CIP

ID	Total Demand (gpm)	Hydrant Available Flow (gpm)	Critical Node ID for Design Run	Critical Node Pressure at Available Flow (psi)	Critical Node Pressure at Fire Demand (psi)	Critical Pressure for Design Run (psi)	Hydrant Design Flow (gpm)	Hydrant Pressure at Design Flow (psi)
J26	501.63	1,437.93	J17	18.01	65.3	20	1,411.29	22.71
J89	1,001.63	1,450.82	J97	18.97	26.36	20	1,413.33	21.64
J85	1,501.63	1,751.41	J97	11.27	18.15	20	1,436.65	39.66
J211	1,501.63	2,120.85	J54	12.58	19.52	20	1,441.71	57.94
J39	1,501.63	1,734.82	J54	17.36	19.52	20	1,441.89	43.36
J40	1,501.63	1,600.92	J54	18.73	19.54	20	1,443.14	34.02
J111	1,001.63	1,473.96	J111	20	42.56	20	1,473.96	20
J193	1,001.63	1,475.93	J193	20	35.05	20	1,475.93	20
J84	1,501.63	1,780.70	J97	12.47	19.48	20	1,484.07	40.84
J49	1,501.63	2,211.41	J54	11.31	20.01	20	1,502.66	55.47
J99	1,001.63	1,510.14	J99	20	31.21	20	1,509.17	20
J83	1,501.63	1,884.22	J97	10.13	20.29	20	1,521.13	44.72
J66	1,501.63	1,848.92	J54	16.86	20.36	20	1,543.06	41.76
J90	1,001.63	1,557.66	J90	20	39.24	20	1,552.70	19.95
J92	1,001.63	2,048.26	J97	4.09	26.56	20	1,558.57	43.04
J212	1,001.63	1,722.29	J97	15.62	26.68	20	1,559.94	26.48
J68	1,501.63	1,883.83	J54	16.74	20.56	20	1,567.06	39.68
J126	1,001.63	1,802.60	J159	11.33	41.57	20	1,579.97	28.97
J145	1,001.63	1,649.39	J97	18.3	26.71	20	1,582.08	22.24
J73	1,501.63	2,257.19	J96	0.16	21.78	20	1,585.89	58.49
J152	1,001.63	1,675.73	J97	18.03	26.7	20	1,586.00	22.94
J65	1,501.63	1,884.67	J54	17.22	20.92	20	1,613.50	39.35

2043 20 year MDD plus FF
No CIP

ID	Total Demand (gpm)	Hydrant Available Flow (gpm)	Critical Node ID for Design Run	Critical Node Pressure at Available Flow (psi)	Critical Node Pressure at Fire Demand (psi)	Critical Pressure for Design Run (psi)	Hydrant Design Flow (gpm)	Hydrant Pressure at Design Flow (psi)
J72	1,501.63	2,030.89	J97	8.72	22.08	20	1,613.62	48.3
J71	1,501.63	2,004.73	J97	10	22.34	20	1,619.85	47.18
J132	1,001.63	1,626.39	J132	20	54.98	20	1,626.12	20.13
J70	1,501.63	2,116.02	J54	14.25	21.14	20	1,656.26	46.86
J129	1,001.63	1,677.75	J129	20	47.05	20	1,677.53	20
J94	1,501.63	2,099.38	J54	14.8	21.49	20	1,678.47	46.12
J77	1,501.63	2,338.59	J54	11.02	21.52	20	1,679.67	61.56
J81	1,501.63	2,165.38	J54	14.1	21.61	20	1,694.65	52.48
J76	1,501.63	2,094.28	J54	14.64	21.36	20	1,697.75	44.54
J113	1,001.63	2,270.14	J159	7.91	43.96	20	1,707.82	34.3
J139	1,001.63	1,729.20	J139	20	54.88	20	1,729.20	20
J102	1,001.63	1,840.20	J149	15.51	34.92	20	1,730.32	25.24
J124	1,001.63	1,886.53	J163	15.55	47.46	20	1,783.83	24.3
J135	1,001.63	1,835.50	J135	20	52.12	20	1,835.50	20
J210	501.63	1,994.14	J210	20	147.31	20	1,994.14	20
J167	1,501.63	2,302.62	J120	14.98	26.87	20	1,999.09	32.39
J170	501.63	2,940.89	J178	-1.82	33.8	20	2,405.40	56.11
J105	1,001.63	1,663.03	J111	20.37	45.40			

2043 20 year MDD plus FF

Increased 2nd St to 8", increased school line to 8"

Increased Columbia St PRV settings to 32psi/37psi

Added Boege Rd/SR4 PRVs

Added Kent's Bridge Res 2

ID	Total Demand (gpm)	Hydrant Available Flow (gpm)	Critical Node ID for Design Run	Critical Node Pressure at Available Flow (psi)	Critical Node Pressure at Fire Demand (psi)	Critical Pressure for Design Run (psi)	Hydrant Design Flow (gpm)	Hydrant Pressure at Design Flow (psi)
J19	501.63	1,052.33	J17	-1.67	54.13	20	874	41.7
J18	501.63	909.32	J18	20	71.33	20	909	20
J58	501.63	927.45	J58	20	48.15	20	927	20
J20	501.63	1,192.00	J17	-5.5	57.25	20	963	46.43
J189	1,001.63	973.59	J189	20	18.68	20	973.59	20
J36	1,001.63	1,005.89	J36	20	20.21	20	1,005.90	20.01
J22	501.63	1,246.12	J17	-2.85	59.04	20	1,025.67	43.22
J97	1,001.63	1,155.03	J97	20	22.95	20	1,155.03	20
J27	501.63	1,215.77	J27	20	66.21	20	1,215.77	20
J148	1,001.63	1,219.12	J148	20	26.68	20	1,218.87	20
J51	1,001.63	2,432.70	J54	3	22.29	20	1,264.96	60.61
J3	501.63	1,502.15	J17	4.41	64.22	20	1,306.42	38.76
J23	501.63	1,384.82	J17	15.36	64.46	20	1,324.31	25.73
J34	501.63	1,752.70	J36	4.67	43.27	20	1,372.75	43.39
J149	1,001.63	1,394.02	J149	20	30.51	20	1,394.02	20
J33	501.63	1,690.73	J36	9	43.44	20	1,404.18	42.82
J32	501.63	1,689.98	J36	9.03	43.44	20	1,404.18	42.78
J26	501.63	1,440.81	J17	18.05	65.53	20	1,414.58	22.63
J134	1,001.63	1,416.74	J134	20	45.43	20	1,416.74	20
J95	1,001.63	1,567.07	J97	14.32	28.73	20	1,422.41	25.9
J143	1,001.63	1,431.73	J143	20	27.11	20	1,429.26	20.1
J158	501.63	1,449.92	J158	20	55.49	20	1,449.92	20

2043 20 year MDD plus FF

Increased 2nd St to 8", increased school line to 8"

Increased Columbia St PRV settings to 32psi/37psi

Added Boege Rd/SR4 PRVs

Added Kent's Bridge Res 2

ID	Total Demand (gpm)	Hydrant Available Flow (gpm)	Critical Node ID for Design Run	Critical Node Pressure at Available Flow (psi)	Critical Node Pressure at Fire Demand (psi)	Critical Pressure for Design Run (psi)	Hydrant Design Flow (gpm)	Hydrant Pressure at Design Flow (psi)
J89	1,001.63	1,503.32	J89	20	35.94	20	1,497.81	20
J211	1,501.63	2,157.17	J54	12.72	20.06	20	1,509.01	56.93
J193	1,001.63	1,509.61	J193	20	36.42	20	1,509.61	20
J39	1,501.63	2,115.32	J54	13.32	20.11	20	1,515.38	59.25
J40	1,501.63	2,133.07	J54	13.13	20.15	20	1,520.43	60.6
J43	1,501.63	2,315.77	J54	10.79	20.25	20	1,529.81	65.83
J49	1,501.63	2,280.75	J54	11.33	20.3	20	1,536.27	55.64
J85	1,501.63	1,782.21	J97	13.25	21.76	20	1,569.13	34.53
J99	1,001.63	1,577.89	J99	20	32.74	20	1,572.03	20
J66	1,501.63	1,915.05	J54	16.59	20.65	20	1,580.92	43.1
J90	1,001.63	1,603.55	J90	20	40.94	20	1,599.60	20
J68	1,501.63	1,923.13	J54	16.76	20.85	20	1,607.29	39.66
J111	1,001.63	1,628.01	J111	20	46.81	20	1,627.85	20.04
J84	1,501.63	1,815.60	J97	15.33	22.89	20	1,638.33	32.08
J65	1,501.63	1,924.76	J54	17.31	21.23	20	1,665.00	39.03
J83	1,501.63	1,932.95	J97	13.35	23.67	20	1,695.06	35.65
J152	1,001.63	1,735.67	J151	18.88	36.29	20	1,695.23	21.06
J81	1,501.63	2,229.83	J97	4.94	24.26	20	1,711.11	53.27
J145	1,001.63	1,723.01	J145	20	36.62	20	1,715.67	20
J70	1,501.63	2,197.68	J54	14.6	21.55	20	1,718.96	46.87
J212	1,001.63	1,816.08	J97	17.86	30.26	20	1,738.43	22.45
J126	1,001.63	2,048.24	J159	11.33	46.59	20	1,743.67	28.63

2043 20 year MDD plus FF

Increased 2nd St to 8", increased school line to 8"

Increased Columbia St PRV settings to 32psi/37psi

Added Boege Rd/SR4 PRVs

Added Kent's Bridge Res 2

ID	Total Demand (gpm)	Hydrant Available Flow (gpm)	Critical Node ID for Design Run	Critical Node Pressure at Available Flow (psi)	Critical Node Pressure at Fire Demand (psi)	Critical Pressure for Design Run (psi)	Hydrant Design Flow (gpm)	Hydrant Pressure at Design Flow (psi)
J132	1,001.63	1,753.99	J132	20	54.02	20	1,753.99	20
J71	1,501.63	2,068.07	J54	16.71	21.8	20	1,762.46	42.5
J76	1,501.63	2,174.40	J54	15.3	21.87	20	1,775.26	43.96
J72	1,501.63	2,103.94	J54	16.51	21.9	20	1,780.04	42.55
J73	1,501.63	2,331.76	J54	12.81	22.03	20	1,805.02	52.47
J94	1,501.63	2,172.93	J54	15.32	22.08	20	1,809.70	43.44
J92	1,001.63	2,140.11	J54	16.41	24.94	20	1,809.73	35.99
J77	1,501.63	2,417.24	J54	11.48	22.07	20	1,812.18	59.41
J102	1,001.63	1,942.76	J149	16.13	36.3	20	1,818.52	24.51
J139	1,001.63	1,878.90	J139	20	53.89	20	1,878.90	20
J129	1,001.63	1,911.78	J129	20	51.18	20	1,911.35	20.21
J105	1,001.63	1,911.53	J105	20	51.04	20	1,911.53	20
J124	1,001.63	2,069.08	J163	15.59	53.52	20	1,942.56	24.48
J210	501.63	1,993.02	J210	20	147.27	20	1,993.02	20
J113	1,001.63	2,501.81	J159	9.39	49.36	20	2,026.82	33
J135	1,001.63	2,028.78	J135	20	51.1	20	2,028.78	20
J170	501.63	2,852.52	J178	-5.33	33.74	20	2,116.85	63.75
J167	1,501.63	2,275.55	J178	16.83	32.96	20	2,122.22	29.4

APPENDIX L

RAW WATER INTAKE EVALUATION

TOWN OF CATHLAMET

WAHKIAKUM COUNTY **WASHINGTON**

RAW WATER INTAKE EVALUATION

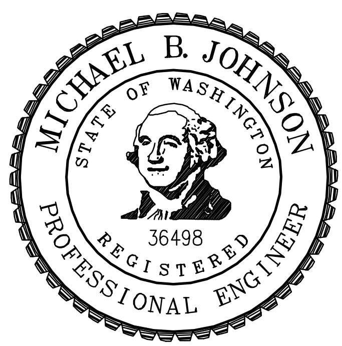
G & O No. 02304
MARCH 2003

Gray & Osborne, Inc.
CONSULTING ENGINEERS
701 DEXTER AVENUE NORTH SUITE 200
SEATTLE, WASHINGTON 98109 • (206) 284-0860

TOWN OF CATHLAMET

WAHKIAKUM COUNTY **WASHINGTON**

RAW WATER INTAKE EVALUATION



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CHAPTER 1

INTRODUCTION

BACKGROUND

The Town of Cathlamet is located in Wahkiakum County in southwest Washington, along the Columbia River. The location of the Town is shown on the Vicinity Map in Figure 1-1. The Town of Cathlamet operates a public water supply system with the Washington State Department of Health (DOH) Identification No. 11850D. The Town of Cathlamet water system currently serves approximately 1,000 service connections.

The sole source of water for the Town of Cathlamet Water System is an infiltration gallery type collector that withdraws water from the bed of the Elochoman River. The intake was originally constructed in 1967 and was modified in 1985. The intake feeds a manhole that serves as a wet well for the raw water pump station.

Raw water from the intake is treated by a rapid rate filtration plant located adjacent to the intake. The original water filtration plant consisted of a raw water sedimentation basin followed by a rapid sand filtration plant. In 1999, the Town of Cathlamet commissioned a new 700 gpm rapid sand water filtration plant. The plant has two (2) filtration trains that each consists of an adsorption clarifier followed by a dual media filter. The raw water sedimentation basin was eliminated during construction of the new filtration plant. The new filtration plant can effectively treat raw water with turbidities up to 150 NTU. At higher turbidities, the filter can become blinded with solids. Based on historical raw water turbidity data, it is possible that the new filter plant would be unable to adequately treat raw water from the Elochoman Intake under some conditions. During these high turbidity events in the past, the raw water intake pipe and raw water pump have accumulated sediment severely restricting the flow of raw water into the treatment plant.

SCOPE

The Town of Cathlamet contracted with Gray & Osborne, Inc. to complete an engineering report that evaluates alternatives for modifications to the Town's raw water intake and/or pre-treatment of its raw water supply. This report addresses the following topics:

- Regulatory Requirements
- Water Quality
- Existing Facilities
- Alternatives
- Evaluation
- Recommendations

REGULATORY REQUIREMENTS

The Washington Administrative Code (WAC) Section 246-290-110 requires the submittal of a project report for any new water system, water system extension, or improvement not covered by categorical exemption. This report is intended to fulfill these requirements.

RAW WATER QUALITY

The Elochoman River watershed consists primarily of forest lands where the major activity is logging operations. Raw water from the Town of Cathalamet's raw water intake can generally be described as low in turbidity except in winter months when storm events can produce rapid changes in water quality. The turbidity is believed to be predominantly inorganic in nature from clay and silt particles suspended by run-off from the Elochoman River watershed. During low turbidity periods, raw water is generally low in color and organics, low in alkalinity, with little iron and manganese.

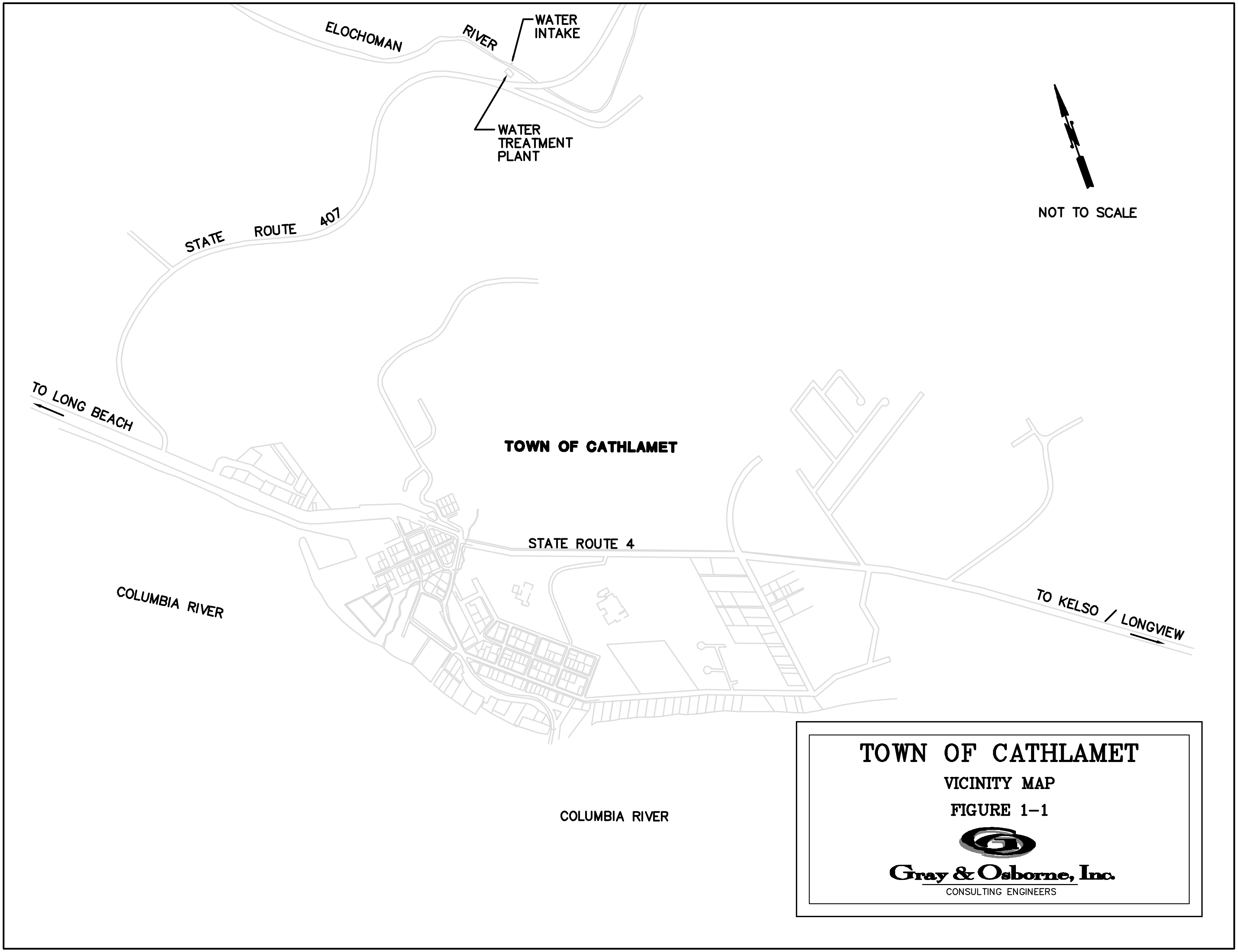
The raw water quality data of primary concern for this evaluation are the frequency, duration, and magnitude of high turbidity events that make operation of the intake and the filtration facility problematic. Monthly turbidity monitoring records were examined for the period from June 1997 through February 2002. Table 1-1 indicates the frequency that turbidity events of various magnitudes occurred during this period.

TABLE 1-1

High Turbidity Event Frequency June 1997 – February 2002

Turbidity (NTU)	Days Greater Than	Frequency
20	63	3.6%
50	32	1.8%
75	17	1.0%
100	17	1.0%
150	12	0.7%
200	9	0.5%

Table 1-2 indicates how long various magnitude turbidity events lasted during the period from June 1997 through February 2002.



TOWN OF CATHLAMET

VICINITY MAP

FIGURE 1-1

Gray & Osborne, Inc.

CONSULTING ENGINEERS

TABLE 1-2

High Turbidity Event Duration
June 1997 – February 2002

Month	Consecutive Days > 150 NTU
December 1998	1
December 1998/January 1999	5
January 99	4
February 99	1

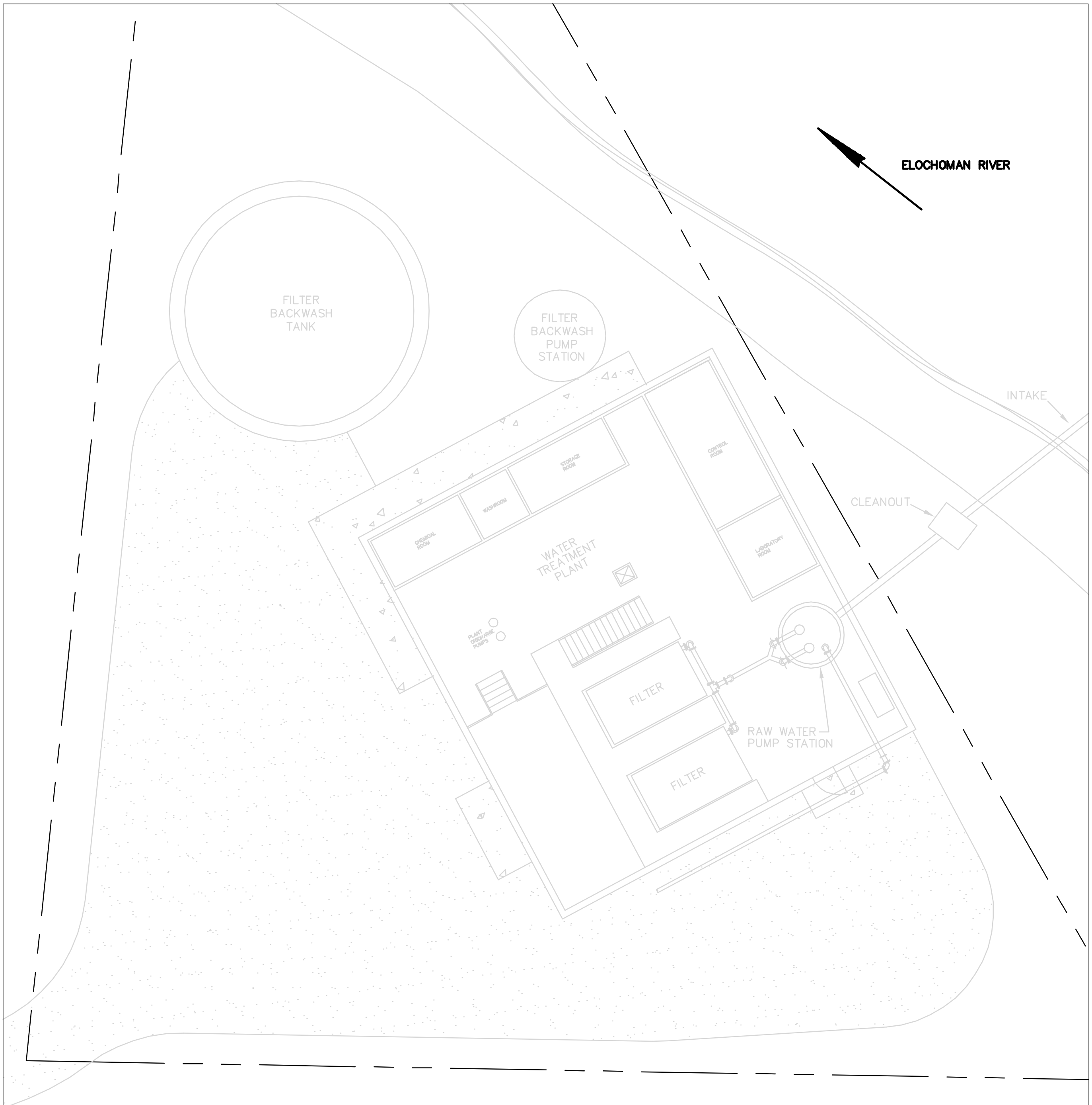
Tables 1-1 and 1-2 show that high turbidity events that adversely impact intake and filter plant operation for long periods of time occur infrequently.

EXISTING FACILITIES

The Town's existing raw water intake is located adjacent to the Town's water treatment plant as shown in Figure 1-2. The intake consists of a 200-foot long, ten-inch diameter polyethylene pipe with concrete anchors located at 20 feet on center. The intake pipe is perforated with 1/4-inch diameter holes evenly spaced to provide 40 holes per linear foot of pipe. The pipe is installed in a gravel trench in the Elochoman River approximately five feet below the river bed. The intake pipe terminates in a manhole on either side of the river. Figure 1-3 shows the layout of the intake pipe.

Water from the intake pipe flows by gravity into the raw water pump station manhole. Two 300 gpm vertical turbine pumps convey water from this manhole into the water treatment plant. A slide gate isolates the raw water manhole from the intake pipe.

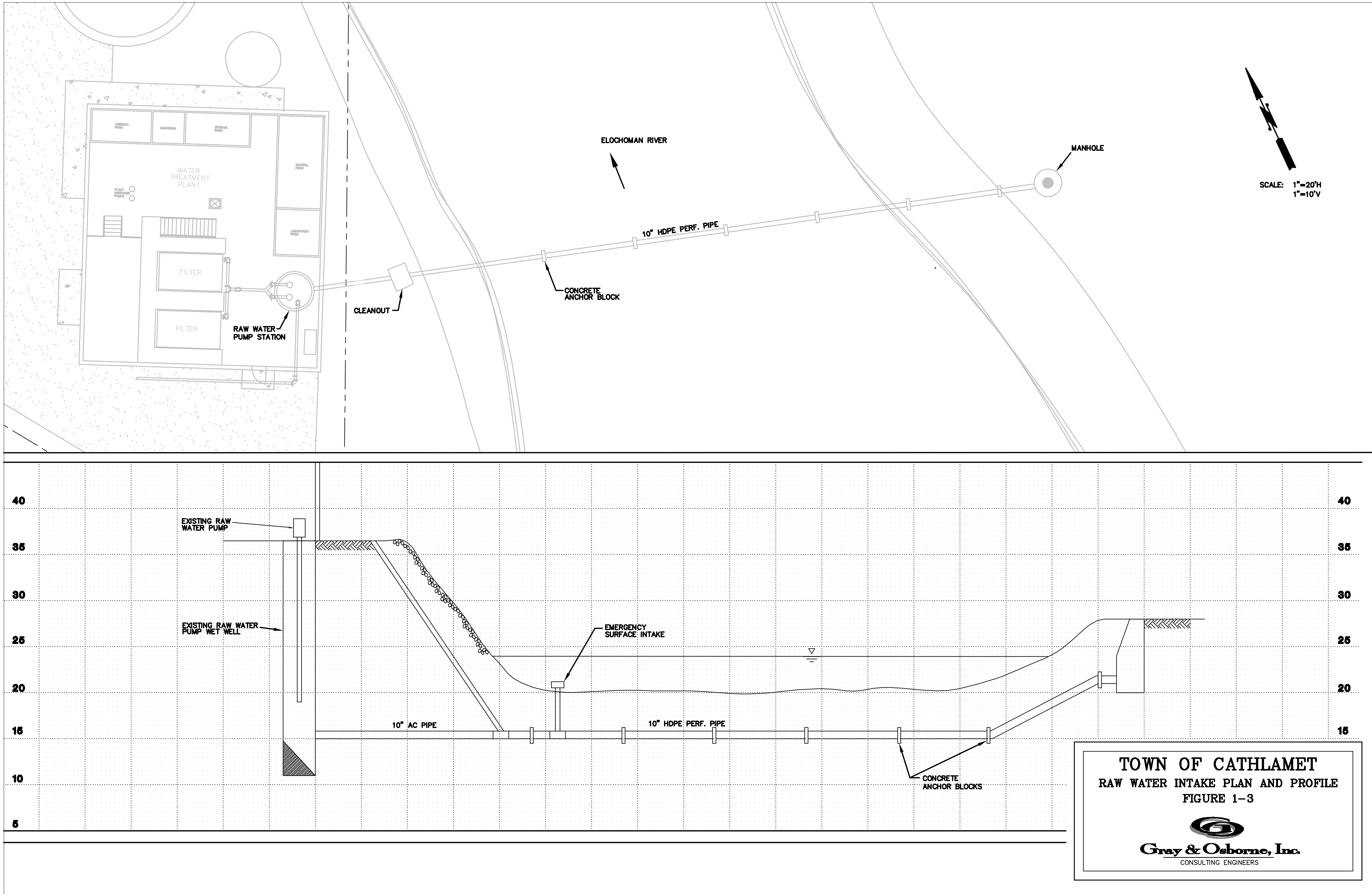
Over the last several years, Town staff has worked to modify the intake to improve its performance during high turbidity conditions. The Town has connected the water treatment plant air blower to a cleanout on the intake line with flexible hose to periodically flush sediment from the intake. During flushing operations, air can be observed exiting the intake pipe in the river out to approximately 25 feet from the riverbank. Air does not appear to travel any further in the pipe. The Town has attempted to pig the intake line and inspect the line with a closed circuit video camera; however, accumulated sediment and protrusions at the joint welds on the intake pipe made both projects difficult. The investigation did find that several inches of sediment had collected in bottom of the intake pipe.



SCALE: 1"=20'-0"

TOWN OF CATHLAMET
SITE PLAN
FIGURE 1-2

Gray & Osborne, Inc.
CONSULTING ENGINEERS



TOWN OF CATHLAMET
RAW WATER INTAKE PLAN AND PROFILE
FIGURE 1-3

CHAPTER 2

ALTERNATIVES

GENERAL

Alternatives for solving the Town of Cathlamet's raw water intake problems can be grouped into one (1) of the following four (4) categories:

1. Status Quo
2. Provide Additional Storage
3. Modify/Replace the Intake
4. Provide Additional Pre-Treatment

The "Status Quo" alternative will be used to compare the other alternatives against. Some "Modify/Replace the Intake" alternatives will need to be combined with a "Provide Additional Pre-Treatment" alternative to effectively solve the intake problem. The following sections describe the alternatives for each category.

STATUS QUO

This alternative would consist of continuing to operate the intake and treatment facility as it has been for the last several years. Currently, the Town must flush the intake approximately once every five (5) days. When raw turbidity rises above 75 NTU, Town staff must flush the intake more frequently, up to several times per day. When the raw water turbidity rises above 150 NTU, Town staff have trouble producing an adequate quantity and quality of water due to problems with the raw water intake, raw water pump station, and filtration equipment. These type of events occur fairly infrequently and for short durations. As discussed in Chapter 1, over the last five (5) years, turbidity has exceeded 75 NTU on 17 days and 150 NTU on 12 days. The high turbidity periods of longest duration occurred during the winter of 1998-99 and included a period four (4) days long and a period five (5) days long.

During these periods, operating staff have had significant difficulty providing an adequate quantity of water that meets state standards. The last of these events occurred with the Town's old filtration plant in service. It should be noted that during the worst periods in 1998 and 1999, the raw water settling basin that had been used upstream of the filtration plant was no longer in service due to construction of the new water treatment facility. It is anticipated that the Town's new filtration plant would treat raw water during these events better, however turbidity events above 150 NTU would likely still cause problems with the water intake and the filtration plant. During these periods of time, it is possible that water service might be interrupted.

PROVIDE ADDITIONAL STORAGE

To ensure that a reliable source of water is continuously available to the Town's customers, additional finished water storage could be constructed. With additional finished water storage, the Town would not have to operate the water intake and water treatment facility during periods of extremely high turbidity.

The Town of Cathlamet Regional Water System Plan (Gibbs & Olson, September 2000) evaluated the required storage for the Town of Cathlamet water system based upon criteria established by the Washington State Department of Health. Currently, the Town has 1,030,000 gallons of finished water storage. The Greenwood Reservoir has a capacity of 500,000 gallons, while the Kent's Bridge Reservoir has a capacity of 530,000 gallons. All water from the water treatment plant is pumped to the Greenwood Reservoir. From the Greenwood Reservoir, a portion of the water is pumped to the Kent's Bridge Reservoir. Table 2-1 summarizes the storage analysis provided in the Water System Plan for projected water demands in 2005 and 2020.

TABLE 2-1

Existing Water Storage Summary

PARAMETER	Water Storage (gal)	
	2005	2020
Operational Storage	92,825	92,825
Equalizing Storage	31,999	60,392
Standby Storage	221,416	395,057
Fire Flow Storage	240,000	240,000
Dead Storage	0	0
Total Storage Required	**541,075**	**788,274**
Total Storage Available	**1,030,000**	**1,030,000**
Excess Storage	**443,760**	**239,706**

At the time of the 2000 Water System Plan, approximately nine connections served by the Greenwood Reservoir were not provided with 30 psi of pressure, making a significant portion of the Greenwood Reservoir dead storage. Recent water main improvements in the vicinity of Greenwood Reservoir have corrected this problem allowing full use of the storage in Greenwood Reservoir as shown in Table 2-1. Table 2-1 also assumes that nesting of fire flow with standby storage is not allowed since this was the assumption used in the 2000 Water System Plan. If nesting of fire flow and standby storage components were considered, an additional 220,000 – 240,000 gallons of storage would be available.

To determine the ability of the existing storage to meet the water demands of the water system during high turbidity events, the total available standby storage was compared to the projected average daily water demands. Average day demands were used since the high turbidity events that impact the system occur in the winter months when water demands are low. Table 2-2 shows that existing storage is capable of serving the average day water demands of the system for two (2) days in 2005 and for one and a half (1.5) days in 2020 without the water treatment plant operating.

TABLE 2-2

Existing Available Storage Time

Parameter	2005	2020
Total Available Standby Storage (gal)[(1)]	665,176	634,763
Average Day Demand (ADD) (gal)[(2)]	326,708	413,529
Days of Standby Storage at ADD	2.0	1.5

(1) Equals Standby Storage plus Excess Storage from Table 2-1
(2) From 2000 WSP (Gibbs & Olson)

If 500,000 gallons of storage were added to the water system, the system would be able serve water demands for a longer period of time without the treatment plant operating. Table 2-3 evaluates the amount of standby storage available if a new 500,000 gallon reservoir were constructed.

TABLE 2-3

Available Storage Time with a New 500,000 Gallon Reservoir

Parameter	2005	2020
Total Available Standby Storage (gal)	1,165,176	1,134,763
Average Day Demand (ADD) (gal)	326,708	413,529
Days of Standby Storage at ADD	3.6	2.7

Table 2-3 indicates that with a new 500,000 gallon reservoir, the water system would be able serve the system demands for 3.6 days in 2005 and for 2.7 days in 2020 without the water treatment plant operating. A new 500,000 gallon reservoir could be constructed at the existing Greenwood Reservoir site. The estimated cost for constructing a 500,000 gallon welded steel reservoir is $627,000. A detailed cost estimate is provided in Appendix A.

If 1,000,000 gallons of storage were added to the water system, the system would be able serve water demands for an extended period of time without the treatment plant operating. Table 2-4 evaluates the amount of standby storage available if a new 1,000,000 gallon reservoir were constructed.

TABLE 2-4

Available Storage Time with a New 1,000,000 Gallon Reservoir

Parameter	2005	2020
Total Available Standby Storage (gal)	1,665,176	1,634,763
Average Day Demand (ADD) (gal)	326,708	413,529
Days of Standby Storage at ADD	5.1	4.0

Table 2-4 indicates that with a new 1,000,000 gallon reservoir, the water system would be able serve the system water demands for 5.1 days in 2005 and for 4.0 days in 2020 without the water treatment plant operating. This would allow the Town to serve water through storage rather than treatment for a period equal to the longest observed high turbidity event over the last five (5) years. Additional storage would also provide the water system with an additional buffer in case of other emergency such as power outage or equipment failure at the water treatment plant. One (1) disadvantage of having so much additional storage would be the potential for taste and odor problems due to long detention times in the storage tanks. A new 1,000,000 gallon reservoir would need to be constructed in the Greenwood Pressure Zone, where higher water demands occur, to reduce the potential for water quality problems in the reservoir. A new site for this reservoir would likely need to be found. The estimated cost for constructing a 1,000,000 gallon welded steel reservoir is $948,000. A detailed cost estimate is provided in Appendix A.

MODIFY/REPLACE THE INTAKE

Several alternatives are available for modifying or replacing the existing raw water intake. The alternatives range from solutions to improve the performance of the existing intake to replacing the intake with a different type of intake. The following paragraphs discuss the various intake modification and replacement alternatives.

EXISTING INTAKE MODIFICATIONS

The current intake air scour system consists of a temporary hose that is secured into the intake cleanout with an inflatable plug. As discussed in Chapter 1, this system doesn't appear to adequately flush the entire intake pipe. It is also difficult to flush the intake with water due to the configuration of the raw water pump station piping. Furthermore, accumulated sediment cannot be readily removed from the raw water pump station. If these deficiencies were corrected and additional flexibility were provided in the telemetry and control system, the intake would be more functional.

To improve the flushing of the raw water intake, several modifications could be made. Additional water and water pressure could be provided by connecting the finished water piping directly to the raw water intake pipe using a reduced pressure backflow preventor. This would allow the Town staff to flush the intake with over 100 psi of water pressure simply by closing the raw water pump station gate and opening a valve on the finished water line. Finished water from the distribution system is chlorinated and would need to be dechlorinated prior to discharging to the river. Dechlorination could be achieved with the injection of sodium bisulfite into the flushing line downstream of the backflow preventor. A flow meter should also be installed on this line to track the amount of water used for flushing. To ensure that all flushing water exited the intake, a new gate valve would be cut into the intake line just before the manhole on the opposite side of the river. This valve would also improve the existing air scour of the intake line by forcing all air out the intake perforations.

The air scour could be further improved by distributing the air more evenly along the full length of the intake pipe. It is possible that the air is currently being obstructed by accumulated sediment in the pipe. To determine whether this is a problem, the intake line should be thoroughly cleaned by high pressure jetting and a vactor truck. Once the intake has been cleaned, the air flush system should be tested again. If the air scour appears to reach the entire length of the intake, the air piping would be connected more permanently to the intake line at the cleanout. If the air flush continues to be seen only exiting the pipe along the near bank, the air should be extended along the length of the intake pipe. This could be accomplished by inserting a 2-inch diameter perforated polyethylene pipe into the intake. The polyethylene pipe would be connected to the water treatment plant's air blower with more permanent piping.

To remove accumulated solids from the bottom of the raw water pump station wet well, a small solids handling pump could be used. This pump could consist of a 3/4-hp self-priming centrifugal pump could be installed above the wet well or a 3/4-hp submersible sump pump installed in the wet well. The pump could either be operated manually or with a timer. Piping would be installed to route the discharge from the pump to the backwash settling basin.

In order to operate the intake and water treatment system more effectively, modifications would be made to the telemetry and control system. Improvements would include the following:

- Provide additional information to the autodialer that could be accessed remotely by the operator including reservoir levels and pump status.
- Segment the alarms on the autodialer further to allow the operator to determine if prompt attention is required.
- Allow the operator to start and stop the Greenwood Reservoir booster pumps remotely.

Figure 2-1 shows the location of the improvements for this alternative. The estimated cost of these improvements is $74,000. A detailed cost estimate is included in Appendix A.

REPLACE THE INTAKE WITH A SURFACE WATER INTAKE

Replacing the existing infiltration gallery style intake with a surface water intake would eliminate some of the problems of providing an adequate quantity of water to the water treatment plant. A surface water intake could consist of three (3) high capacity intake screens mounted on the ends of pipes installed in the river bed. Three (3) intake screens would be installed to provide redundancy in case one (1) was taken out of service. An air line would be connected to each intake screen to flush away accumulated debris.

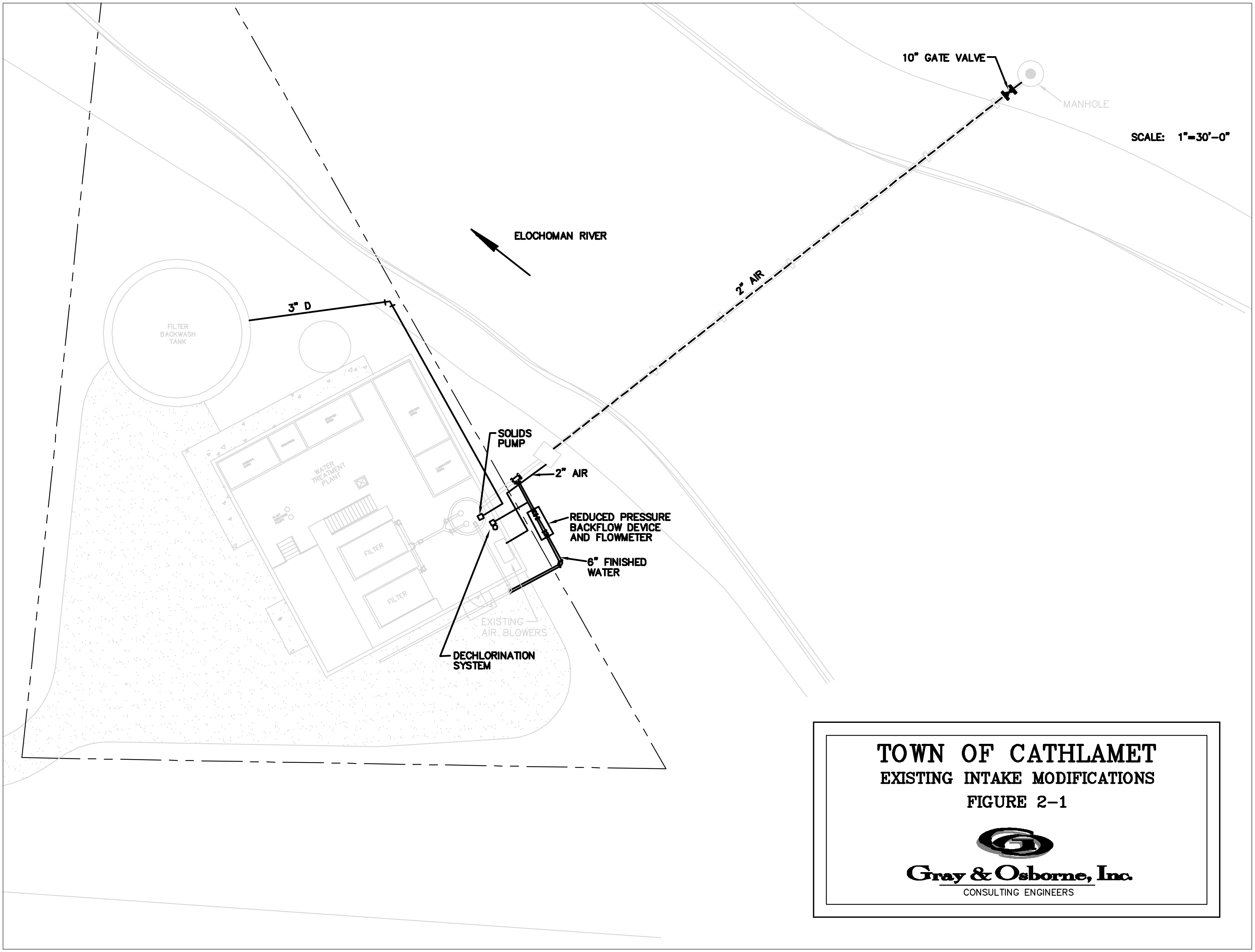
The intake screens would need to be located such that they were submerged during low flow conditions but not subject to being covered by debris from the river bottom. According to the 2000 Water System Plan, this might be difficult in the Elochoman River due to its shallow depth. Furthermore, water quality would likely be worse than the existing intake since a surface water intake does not provide the same degree of natural filtration as an infiltration gallery intake. An additional disadvantage of a surface water intake is that it is more susceptible to damage by logs or other debris carried by the river.

Figure 2-2 shows the proposed layout of a new surface water intake. The estimated cost of this intake is $97,000. A detailed cost estimate is included in Appendix A.

REPLACE THE INTAKE WITH A NEW INFILTRATION GALLERY

The existing intake pipe is perforated with 1/4-inch holes spaced to provide 40 holes per every foot of pipe. At 600 gpm (the current capacity of the raw water pumps), this creates an average velocity of 1.1 feet per second across the holes. In design of intake screens and well screens, an average velocity of less than 0.1 feet per second is typically used to prevent fine grained material from being conveyed into the intake. In order to reduce velocities, additional open area is required for the intake screen. Additional open area can be obtained by using a slotted or v-wire well screen. These screens have a very high open area per lineal foot while maintaining a small slot size to prevent the migration of fine material. This type of intake screen would likely provide a similar water quality to that of the existing intake, with the advantage that it would not require as much operator effort to maintain the capacity.

A new infiltration gallery intake would be constructed with two (2) laterals to allow one (1) to be serviced while the other was operating. A new intake would be provided with both water and air flush capabilities to expel any sediment that might be accumulated in or around the intake screen. To construct a new infiltration gallery intake would require constructing cofferdams to divert the river around the work while the laterals were being installed. This type of construction would require a Hydraulic Project Approval from the Department of Fish and Wildlife. If a federal source of funding is used or federal permits are required, a biological assessment would likely be required. These items would likely require additional time and cost to complete.



TOWN OF CATHLAMET

EXISTING INTAKE MODIFICATIONS

FIGURE 2-1

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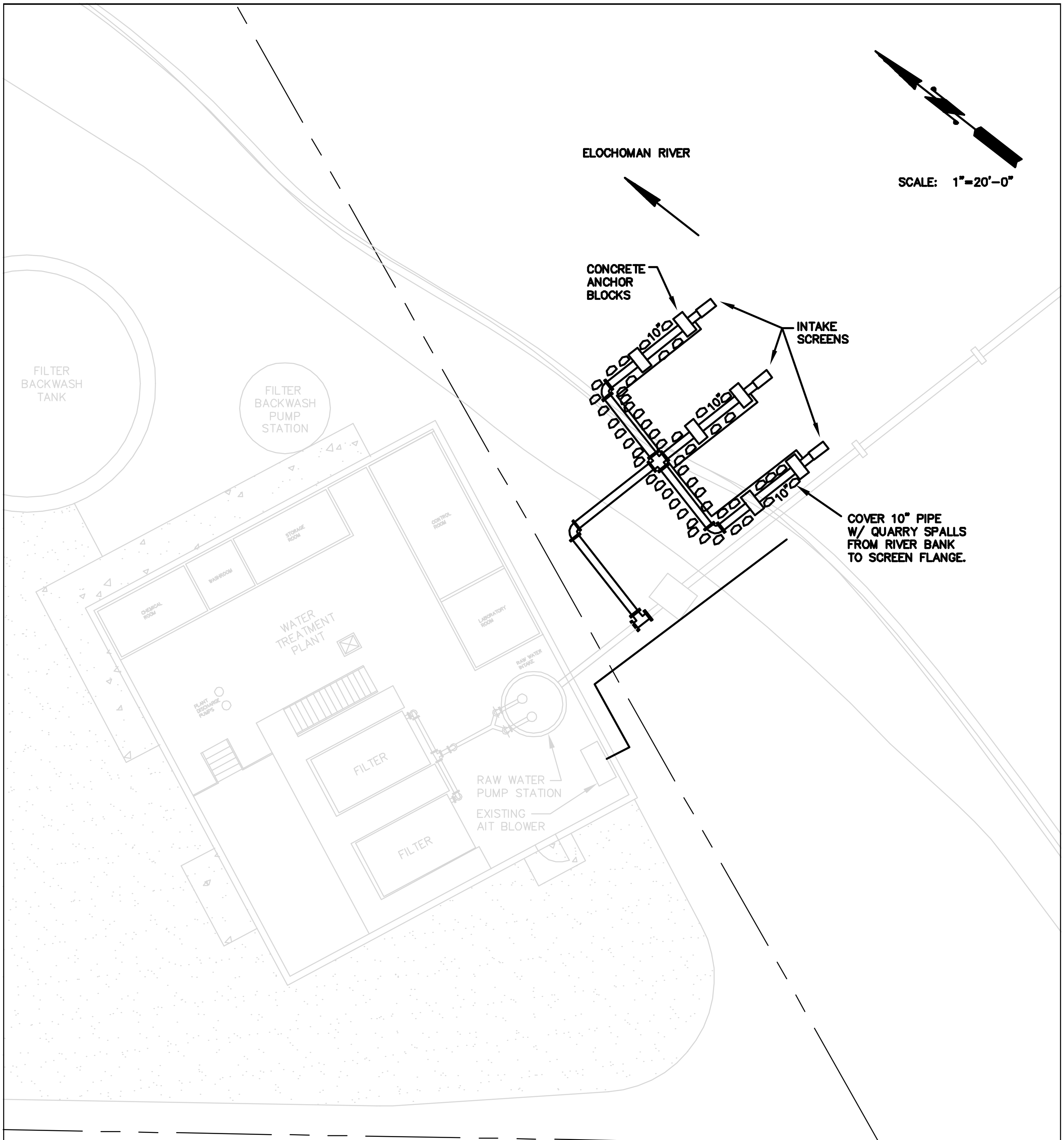

TOWN OF CATHLAMET

SURFACE WATER INTAKE

FIGURE 2-2

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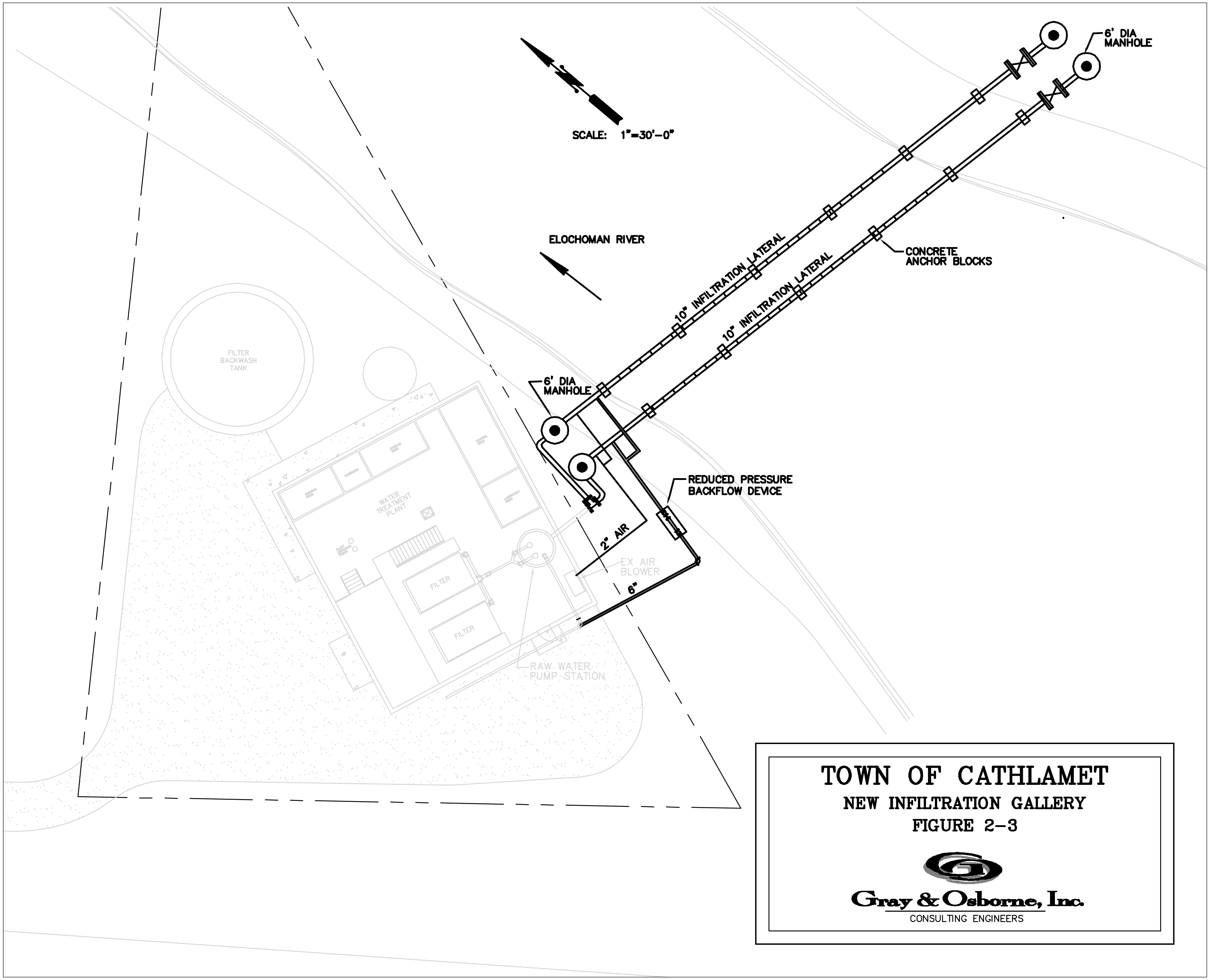

TOWN OF CATHLAMET

NEW INFILTRATION GALLERY

FIGURE 2-3

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CONSULTING ENGINEERS

Figure 2-3 shows a proposed layout of a new infiltration gallery intake. The estimated cost of this intake is $275,000. A detailed cost estimate is included in Appendix A.

REPLACE THE INTAKE WITH A RANNEY WELL COLLECTOR

A Ranney Well collector can be used to create an infiltration gallery type intake without significantly disturbing the riverbed. A Ranney Well is an infiltration gallery intake method developed by the Layne Christensen Company. Ranney Well collectors have been installed in many places in Washington including the City of Kelso, City of Kalama, and City of Woodland. Ranney Well collectors are constructed by sinking a caisson adjacent to the river and boring and jacking laterals with slotted well screens underneath the river bed. Variations on Ranney Wells can include construction similar to the infiltration gallery described above where open cut construction methods are employed. It may also be possible to construct laterals parallel to the river such that a Hydraulic Project Approval is not required. For this alternative, it was assumed that collector laterals would need to be installed by boring and jacking under the river. A caisson would be installed adjacent to the existing treatment building. The discharge pipe from the caisson would be connected to the existing raw water pumps station. Finished water would be directed to the caisson to allow flushing of the laterals.

Figure 2-4 shows a proposed layout of a Ranney Well collector. The estimated cost of the Ranney Well collector is $755,000. A detailed cost estimate is included in Appendix A.

REPLACE THE INTAKE WITH SHALLOW WELL(S)

In 2000, Robinson and Noble approached the Town of Cathlamet regarding the possibility of constructing wells to serve as the water source for the Town. Robinson and Noble speculated that two (2) possible ground water aquifers might exist in the vicinity of the water treatment plant, one (1) located in the shallow river bed materials and one (1) located deeper in Columbia River basalts. Water from a shallow aquifer would likely continue to require surface water treatment, however, if enough natural filtration were provided by the surrounding soil, additional pre-treatment might not be required. A deeper well might not require surface water treatment, but might require treatment for the removal of iron and manganese. As with any ground water investigation, there exists the possibility that an adequate quantity or quality of water may not be able to be obtained once a well is drilled. Robinson and Noble suggested a stepwise approach to developing a possible groundwater source to minimize risk. If the Town decides to pursue this alternative, this type of stepwise approach would be recommended.

For the purposes of this evaluation, it was assumed that all phases of investigation and testing would need to be completed prior to drilling a production well. It was assumed that the shallow aquifer would be utilized. Two (2) production wells would be drilled to provide redundancy. The wells would be provided with submersible pumps and pitless well adapters. An electrical service would be brought to the wells from the water treatment plant.

Figure 2-5 shows a proposed layout for shallow wells. Actual well locations might vary due to hydrogeologic conditions. The estimated cost of the well intake alternative is $303,000. A detailed cost estimate is included in Appendix A. Table 2-5 summarizes the estimated capital costs for all of the Modify/Replace the Intake Alternatives.

TABLE 2-5

Modify / Replace the Intake Alternative
Capital Cost Estimate Summary

Alternative	Estimated Capital Cost
Modify the Existing Intake	$ 74,000
Surface Water Intake	$ 97,000
New Infiltration Gallery	$275,000
Ranney Well Collector	$755,000
Shallow Wells	$303,000

All of the above alternatives except the shallow wells, would likely require additional pre-treatment to effectively solve the Town's intake problems. The shallow wells may provide a sufficient water quality so that additional pre-treatment would not be required. The following section discusses pre-treatment alternatives that might be used upstream of the existing filtration plant.

PRE-TREATMENT ALTERNATIVES

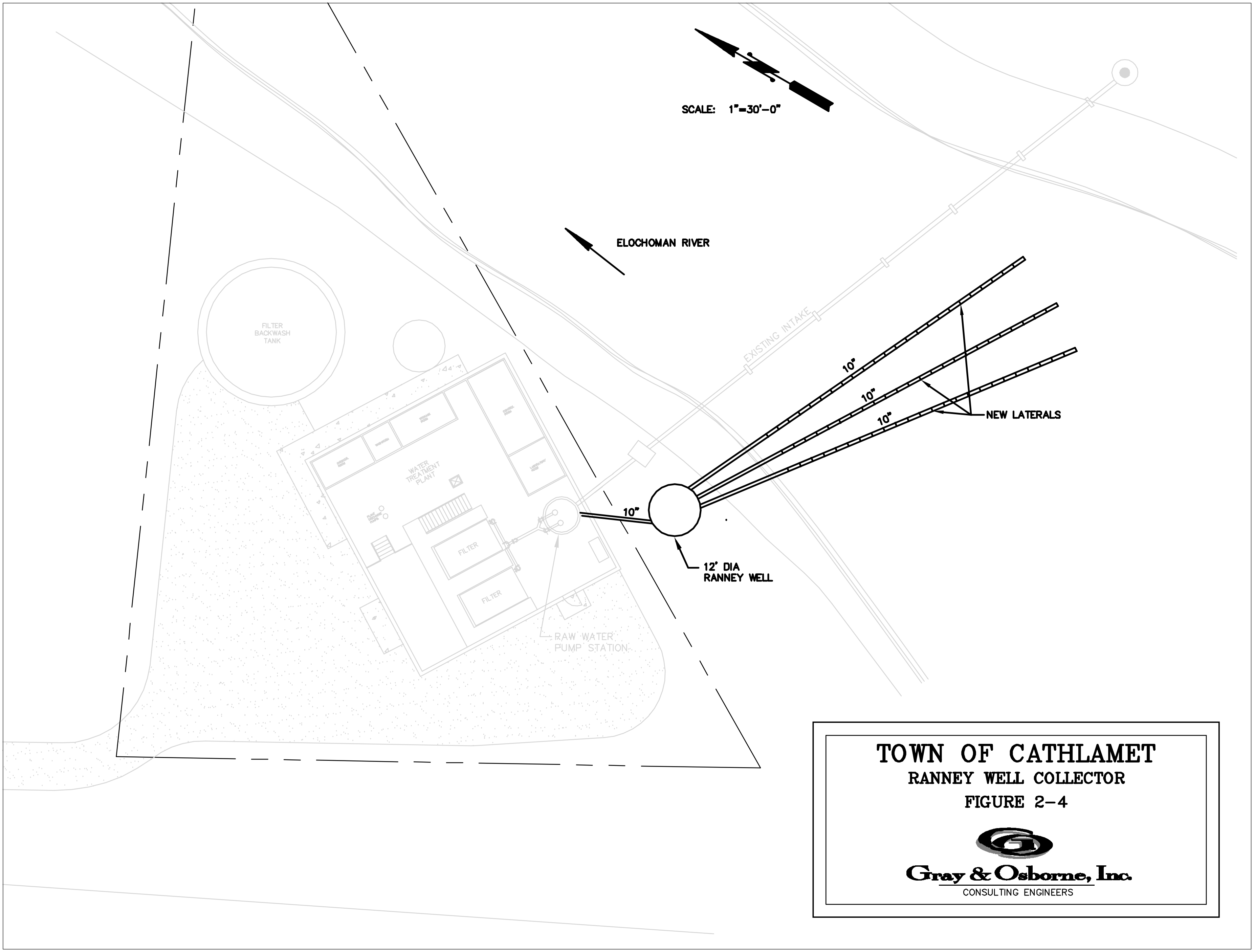
Several alternatives are available for providing pre-treatment of raw water prior to rapid rate filtration. To develop alternatives, design criteria were established for the pre-treatment equipment. The criteria are shown in Table 2-6.

TABLE 2-6

Pre-Treatment Design Criteria

Parameter	Criteria
Flow Rate	700 gpm
Maximum Raw Water Turbidity	500 NTU
Maximum Outlet Turbidity	75 NTU
Maximum Duration of Turbidity Event	5 days

The pre-treatment alternatives range from conventional settling basins to rapid rate clarification to self cleaning screens. All alternatives would require additional hydraulic head, so each alternative includes costs for replacing the raw water pumps. Since the



TOWN OF CATHLAMET
RANNEY WELL COLLECTOR
FIGURE 2-4

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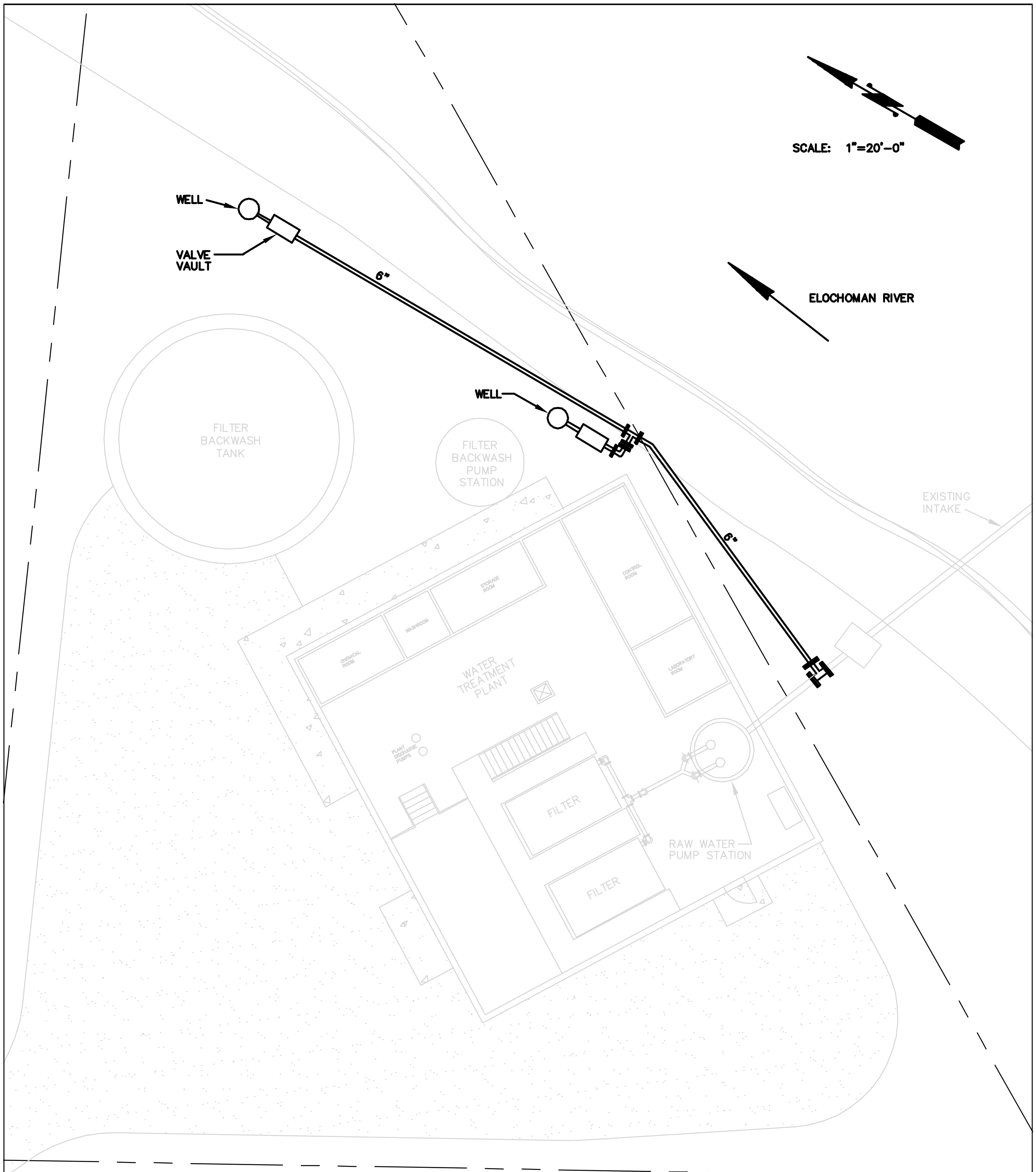

TOWN OF CATHLAMET
SHALLOW WELLS
FIGURE 2-5

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Town has recently obtained additional water rights, it is assumed that the intake pump capacity would be increased to 350 gpm each. The following sections discuss the various intake pre-treatment alternatives.

SETTLING BASIN

Prior to construction of the Town's current water treatment plant, the Town had a raw water settling basin. The raw water settling basin provided a buffer to rapid changes in water quality and reduced the solids loading to the filter plant. Constructing a new raw water settling basin would reduce the solids loading to the new filter plant, thereby improving its performance under high turbidity conditions. The recommended overflow rate for a settling basin is 800 – 1,200 gallons per day per square foot of surface area. For cold waters with lower solids loadings, the lower values of this range should be used. Assuming a loading rate of 800 gpd/sf, the basin would need to be 1,250 square feet to treat 700 gpm. Typically rectangular basins have a length to width ratio of 3:1 to 5:1 to prevent short-circuiting. A basin of 60' x 20' would meet this criteria.

Since the raw water is typically low in turbidity, with a low overall solids load, the basin would be constructed without mechanical solids removal equipment. The bottom of the basin would be sloped to one end where solids could be removed manually be taking the basin out of service. The basin would be constructed of concrete. Water from the raw water pump station would be pumped to the basin. Water would then flow by gravity into the water treatment plant. The basin would be constructed on the south side of the existing water treatment plant. Additional property would likely be required to fit the basin on the site. Figure 2-6 shows a proposed layout for a settling basin. The estimated cost of the settling basin alternative is $320,000. A detailed cost estimate is included in Appendix A.

TUBE SETTLER

The footprint required for a settling basin can be significantly reduced by using inclined tubes or plates to reduce the settling distance for particles in the water. Tube settlers are placed at a 60 degree angle relative to horizontal. The tubes are typically 2-inches square, reducing the settling distance from several feet to just a few inches. As water travels up the tubes, solids settle on the inclined surface. When enough particles have settled on the tubes, they slide down the incline into the bottom of the tank. Tube settlers are usually constructed of a lightweight plastic material such as polyethylene or PVC. They are typically suspended in a rectangular concrete basin. Accumulated solids can be removed from the tank with mechanical solids removal equipment or manually by taking the basin out of service.

The recommended overflow rate for a tube settler is 2 gallons per minute per square foot of surface area. Assuming a loading rate of 2 gpm/sf, the basin would need to be 350 square feet to treat 700 gpm. The basin would have footprint dimensions of approximately 20' x 17.5'. The basin would be constructed of concrete. Water from the raw water pump station would be pumped to the basin. Water would then flow by gravity into the water treatment plant. Since the raw water is typically low in turbidity, with a low solids load, the basin would be constructed without mechanical solids removal equipment. The bottom of the basin would be sloped to one end where solids could be removed. The basin would be constructed on the south side of the existing water treatment plant. Figure 2-7 shows a proposed layout for a tube settler basin. The estimated cost of the tube settler alternative is $291,000. A detailed cost estimate is included in Appendix A.

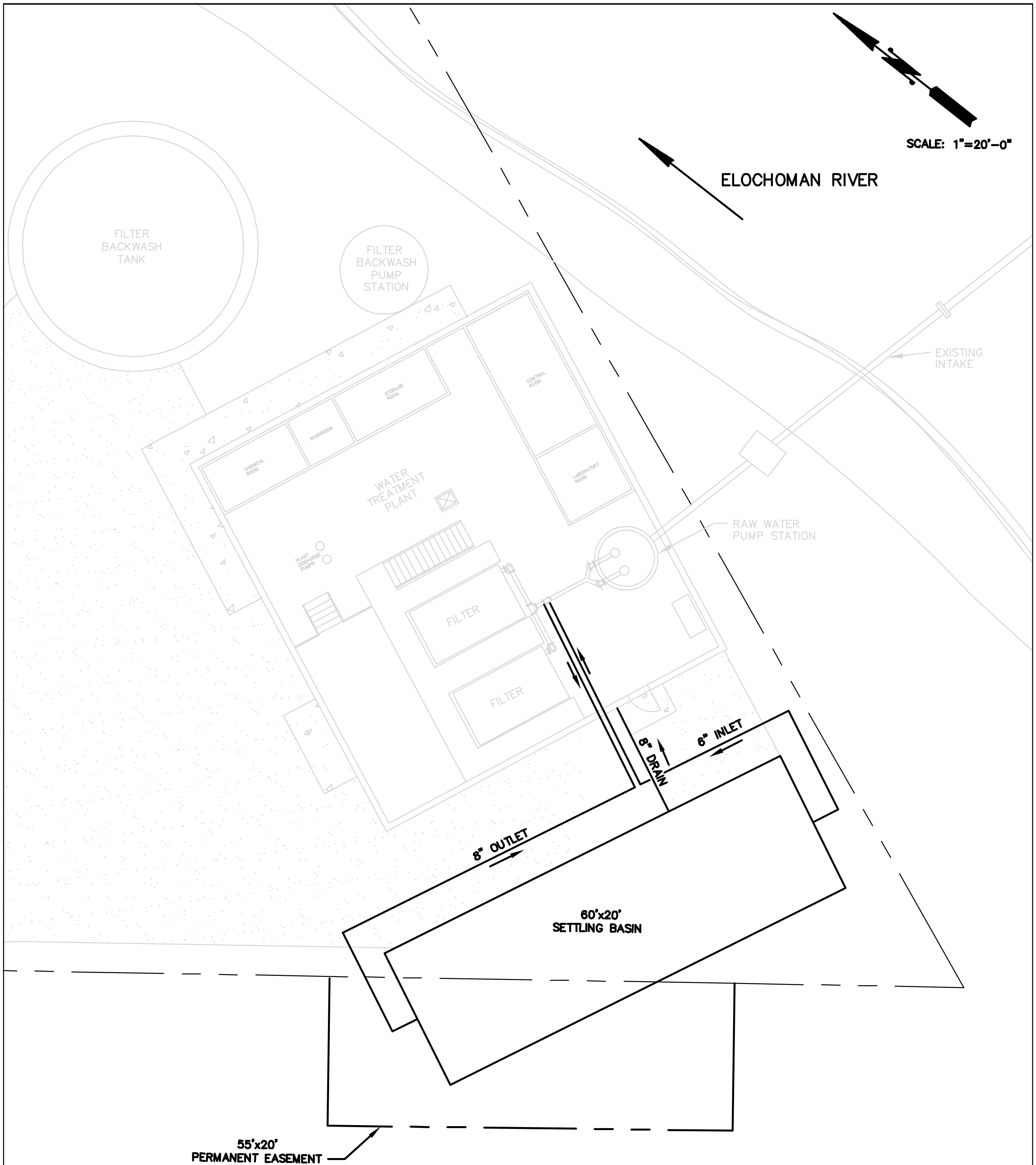
INCLINED PLATE SETTLER

The design of an inclined plate settler is based on similar principles to the design of tube settlers. The inclined plates provide a shorter settling distance in a smaller footprint. The angle of plates in an inclined plate settler can be designed to match the settling characteristics of particles in specific water sources. As with the tube settlers, when water travels up the plates, solids settle on the inclined surface. When enough particles have settled on the plates, they slide down the incline into the bottom of the tank. Inclined plate settlers are typically supplied as package units with a small rapid mix and flocculation tank prior to the plate settling chamber. With the addition of coagulant upstream of the plate settlers, additional solids can be removed prior to filtration. Accumulated solids can be removed from the tank with mechanical solids removal equipment or by collecting them in a hopper and draining them to a pump station.

The recommended overflow rate for an inclined plate settler with coagulation/flocculation upstream is 0.5 gpm/sf of plate area or 4 gpm/sf of basin surface area. Assuming a loading rate of 4 gpm/sf, the basin would need to be 175 square feet to treat 700 gpm. The basin would have footprint dimensions of approximately 18' x 9'. The inclined plate settler would be provided as a painted steel package unit with small rapid mix and flocculation tank. Water from the raw water pump station would be pumped to the basin. Water would then flow by gravity into the water treatment plant. A coagulant line would be extended to the inlet of the plate settler unit to allow the addition of alum if needed. Since the raw water is typically low in turbidity, with a low solids load, the basin would be constructed without mechanical solids removal equipment. The bottom of the basin would be sloped to hoppers where solids could be removed. The hopper outlets would be connected to the plant drain system with a new cleanout installed to facilitate maintenance. The plate settler basin would be installed in the existing treatment building on the north side of the existing filters. Figure 2-8 shows a proposed layout for an inclined plate settler. The estimated cost of the inclined plate settler alternative is $397,000. A detailed cost estimate is included in Appendix A.

SOLIDS CONTACT CLARIFIER

Solids contact clarifiers are another method of raw water clarification that requires a smaller foot print than standard settling tanks. In solids contact clarifiers previously settled solids are recycled through the mixing zone at the inlet to the clarifier to promote



TOWN OF CATHLAMET

SETTLING BASIN

FIGURE 2-6

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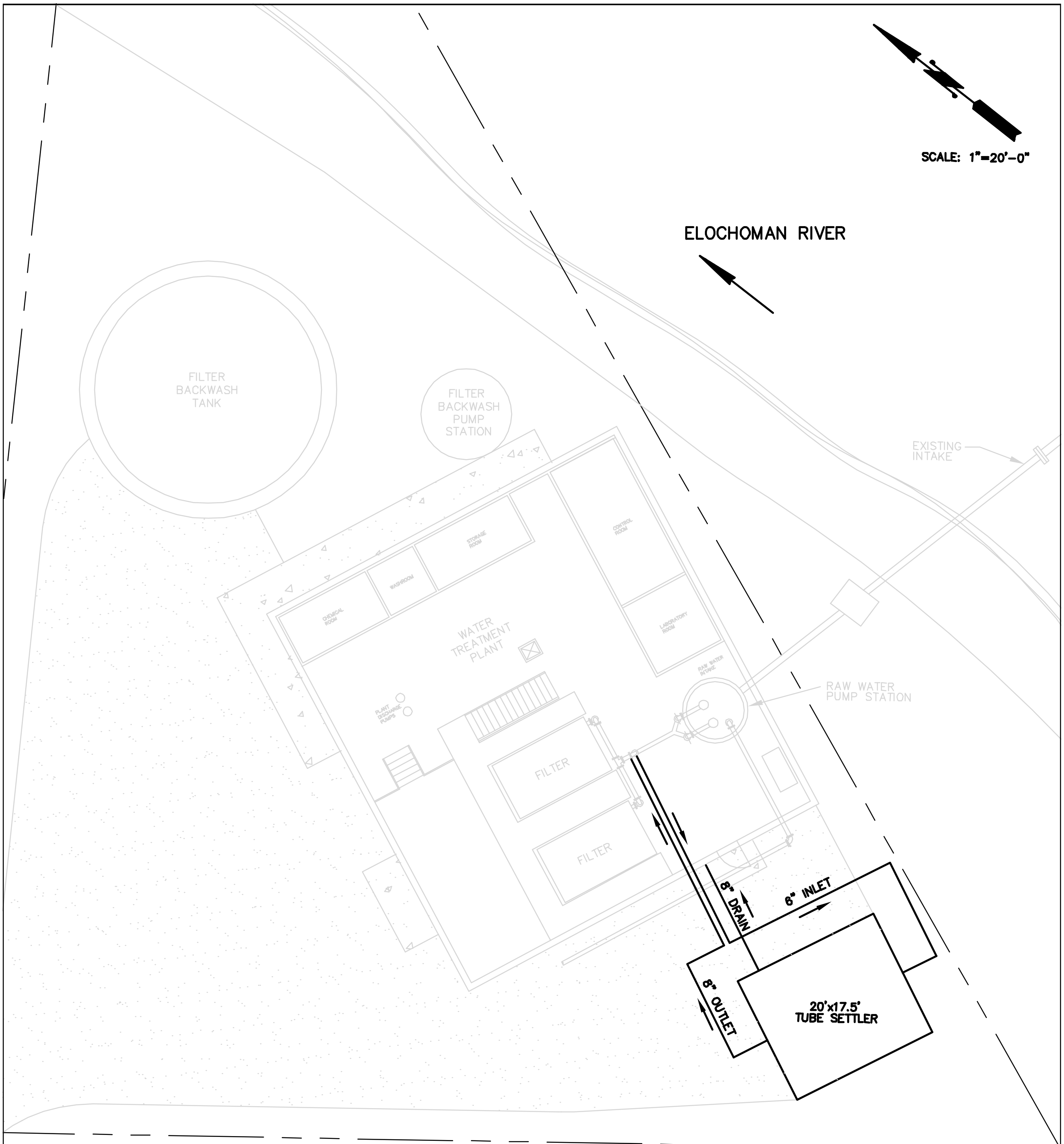

TOWN OF CATHLAMET

TUBE SETTLER

FIGURE 2-7

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contact of particles and the formation of larger floc. Solids are recirculated at a rate of up to 8 times the flow into the clarifier. The sludge blanket formed by this recirculation provides efficient flocculation and greater opportunity for particles to contact within the sludge blanket. Solids contact clarifiers are typically circular with a center feed area for flocculation. They are most effective with the addition of coagulant to help develop the sludge blanket. Accumulated solids are typically removed by mechanical sweep arm that directs the solids to a center hopper.

The recommended rise rate for a solids contact clarifier is 1 gpm/sf. Assuming a rise rate of 1 gpm/sf, the basin would need to be 700 square feet to treat 700 gpm. A basin 32-feet in diameter would accomplish this rise rate. The solids contact clarifier would be provided as a package unit with a painted steel tank and drive mechanism. The tank would be constructed on a concrete foundation. Water from the raw water pump station would be pumped to the basin. Water would then flow by gravity into the water treatment plant. A coagulant line would be extended to the inlet of the solids contact clarifier to allow the addition of alum if needed. The bottom of the basin would be sloped to a hopper where solids could be removed. The hopper outlet would be connected to the plant drain system. A cleanout would be installed to facilitate maintenance. The solids contact clarifier would be installed to the south of the existing treatment building. Additional property would likely be required to fit the basin on the site. Figure 2-9 shows a proposed layout for a solids contact clarifier. The estimated cost of the solids contact clarifier alternative is $418,000. A detailed cost estimate is included in Appendix A.

PULSED BLANKET CLARIFIER

A pulsed blanket clarifier is a type of solids contact clarifier that passes water up through a blanket of previously settled solids. The sludge blanket is kept in suspension through the use of a pulsating water supply system. A vacuum pump and chamber is used to pulse coagulated water into the clarifier. The pulsing action also aids in flocculation by promoting particle contact within the sludge blanket. Pulsed blanket clarifiers are provided as package units. Many are provided with plate settlers above the sludge blanket to aid settling of the particles. They are most effective with the addition of coagulant to help develop the sludge blanket. Accumulated solids are typically overflow to a trough where they can thicken and be removed.

The recommended loading rate for a pulsed blanket clarifier is 1 – 4 gpm/sf. Assuming a rate of 1.6 gpm/sf, the clarifier basin would need to be 438 square feet to treat 700 gpm. A basin 36' x 12' would accomplish this loading rate. The solids contact clarifier would be provided as a package unit with a painted steel tank, plate settlers, and vacuum pump system. The tank would be constructed on a concrete foundation. Water from the raw water pump station would be pumped to the basin. Water would then flow by gravity into the water treatment plant. A coagulant line would be extended to the inlet of the pulsed blanket clarifier to allow the addition of alum if needed. The sludge collection troughs would be connected to the plant drain system. A cleanout would be installed to facilitate maintenance. The pulsed blanket clarifier would be installed to the south of the existing treatment building. Additional right of way would likely be required to fit the basin on the site. Figure 2-10 shows a proposed layout for a pulsed blanket clarifier. The estimated cost of the pulsed blanket clarifier alternative is $751,000. A detailed cost estimate is included in Appendix A.

SELF CLEANING FINE SCREEN

In certain cases, self cleaning fine screens have been utilized to reduce turbidity in high turbidity raw water sources. The fine screens can be provided with openings that range from 10 microns to 100 microns. Provided that a large percentage of the turbidity is greater than this size, the screens can be very effective. Fine screens have a higher headloss than other alternatives but require a smaller footprint. Loading rates for fine screens range from 0.25 to 2 gpm/square inch of screen area. Due to their high loading rate, the screen must be automatically flushed periodically. Assuming a loading rate of 0.25 gpm/sq. in., 2,790 sq. in. of screen area would be required to treat 700 gpm. Three (3) fine screen units would provide this screen area and provide some redundancy for cleaning one (1) screen while the other two (2) were in service.

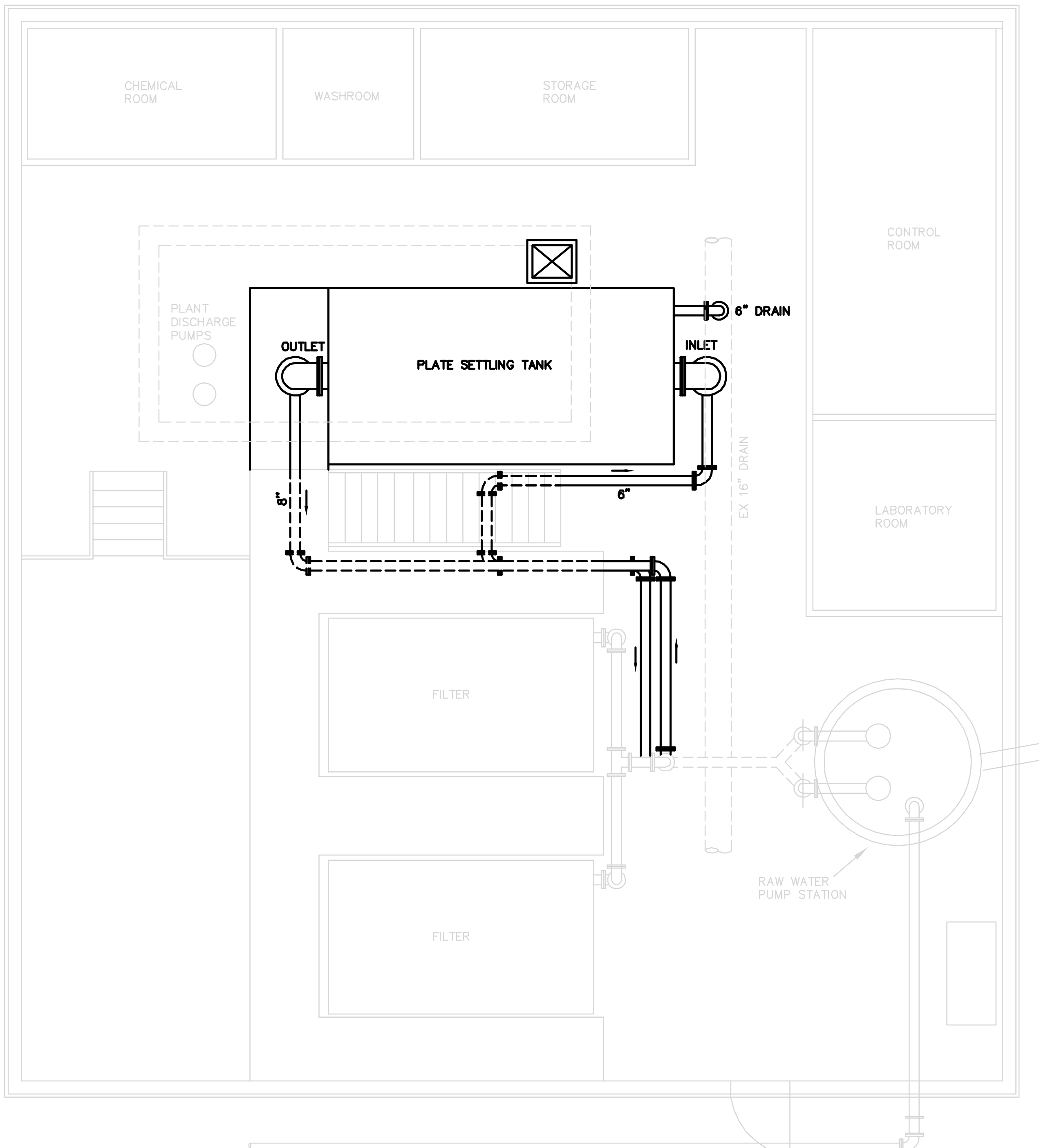
Due to their small footprint, the filters could be installed inside the existing treatment building. To provide adequate head to push water through the fine screen, the raw water pumps would need to be upgraded to 20 hp pumps. A waste line would also need to be connected from fine screen to plant drain system. Figure 2-11 shows a proposed layout for the fine screen. The estimated cost of the self-cleaning fine screen alternative is $288,000. A detailed cost estimate is included in Appendix A.

CONTACT CLARIFIER

A contact clarifier is another method of obtaining flocculation and clarification in a small footprint. A contact clarifier is similar to the adsorption clarifier installed in the existing package treatment unit. Contact clarifiers are very effective at removing particles prior to filtration from low and medium turbidity waters. Because contact clarifiers actually filter particles out of the water, these units can become plugged rapidly by very high turbidity waters. Because of their lower capacity to handle high solids loads, contact clarifiers were not considered further in this evaluation.

DISSOLVED AIR FLOTATION

Dissolved air flotation is another method of clarifying water in a small footprint. Dissolved air flotation uses compressed air to generate very small bubbles in the bottom of a tank. Water flows downward through the tank. As bubbles contact the solids, they float them to the surface of the tank where the solids are withdrawn. Dissolved air flotation is another process that works very well on low and medium turbidity waters. However, in high turbidity waters with high solids loading, the bubbles are unable to lift all of the solids to the surface resulting in some solids settling out and passing through the



TOWN OF CATHLAMET
INCLINED PLATE SETTLER
FIGURE 2-8

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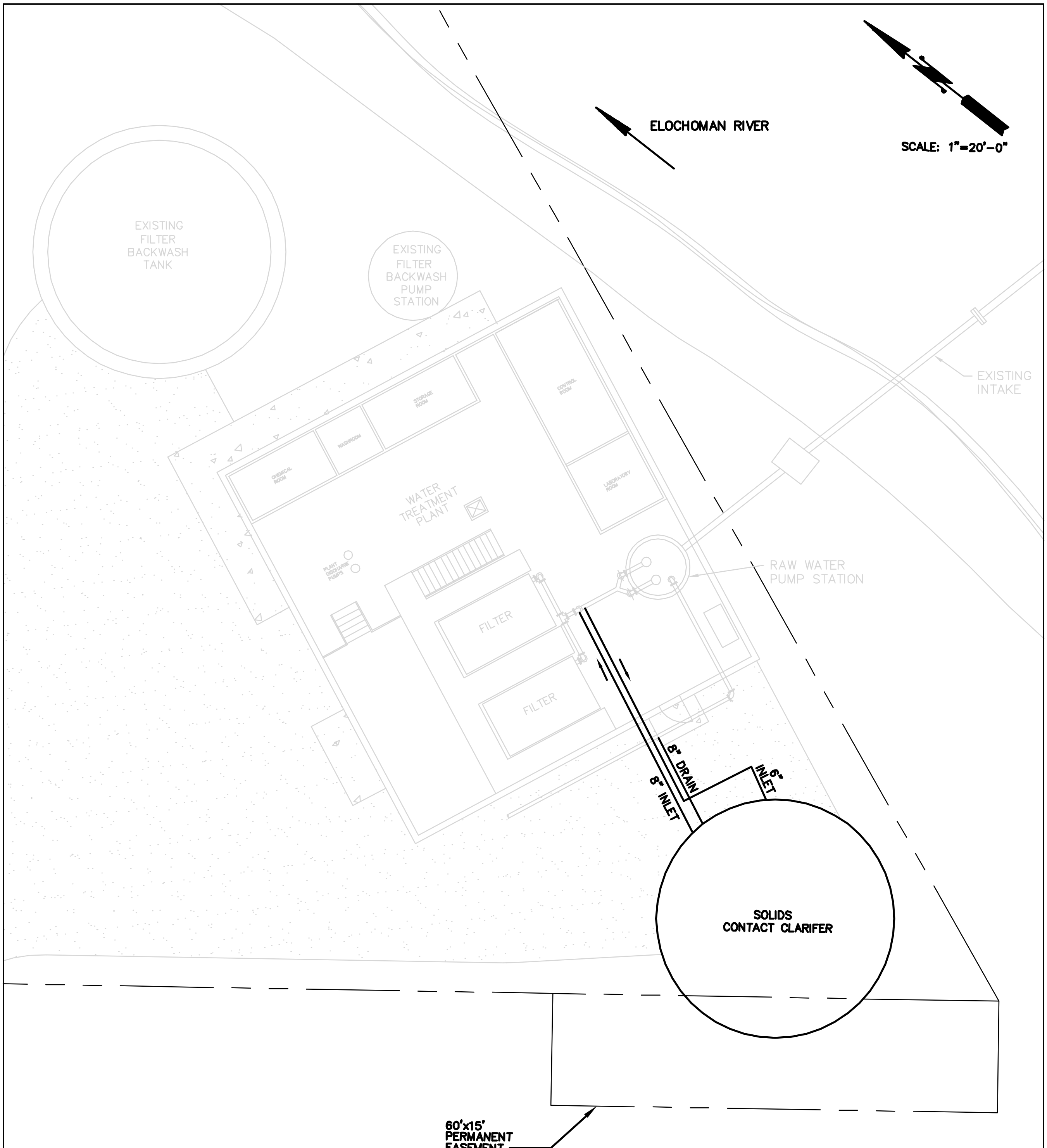

TOWN OF CATHLAMET

SOLIDS CONTACT CLARIFER

FIGURE 2-9

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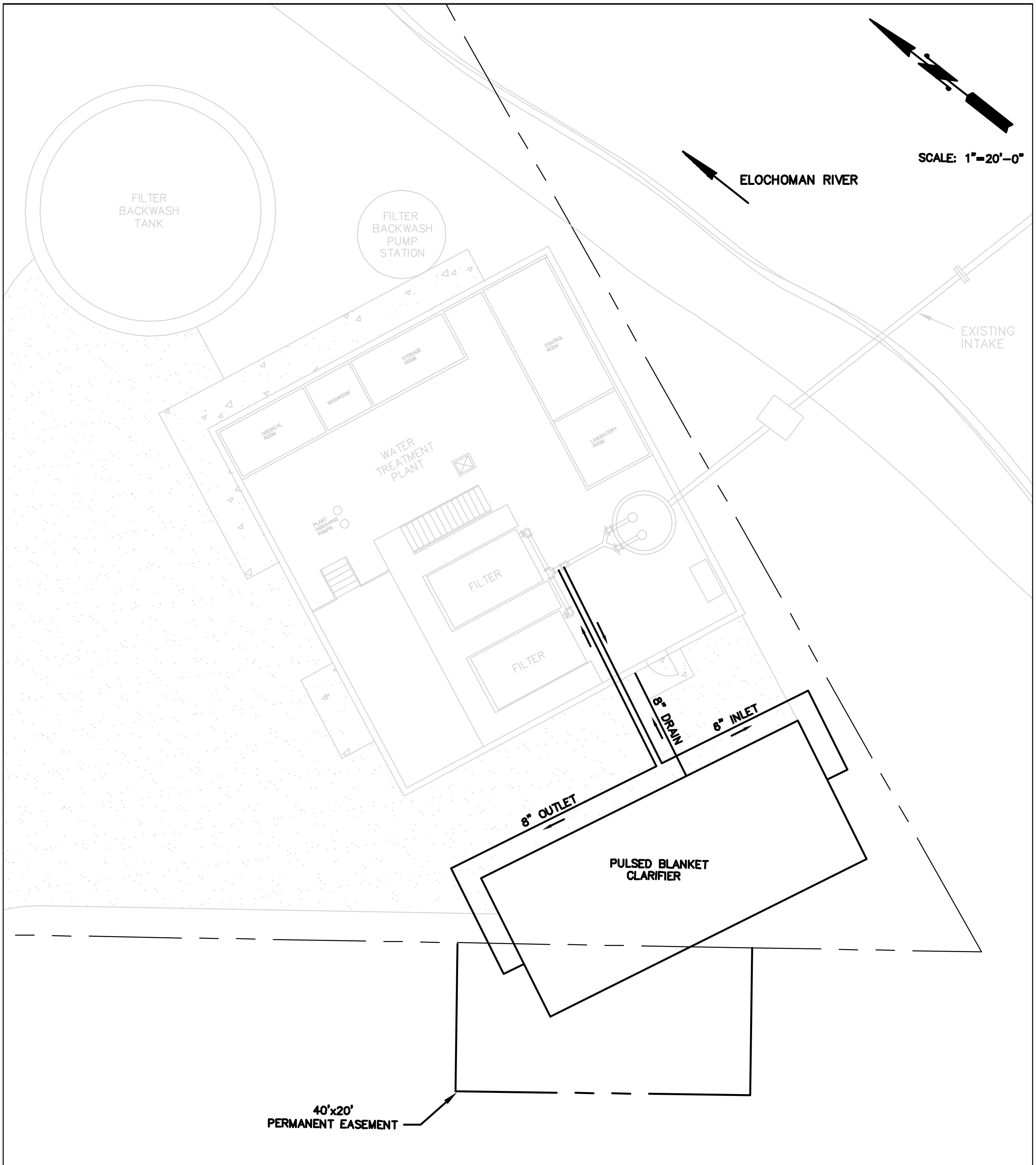


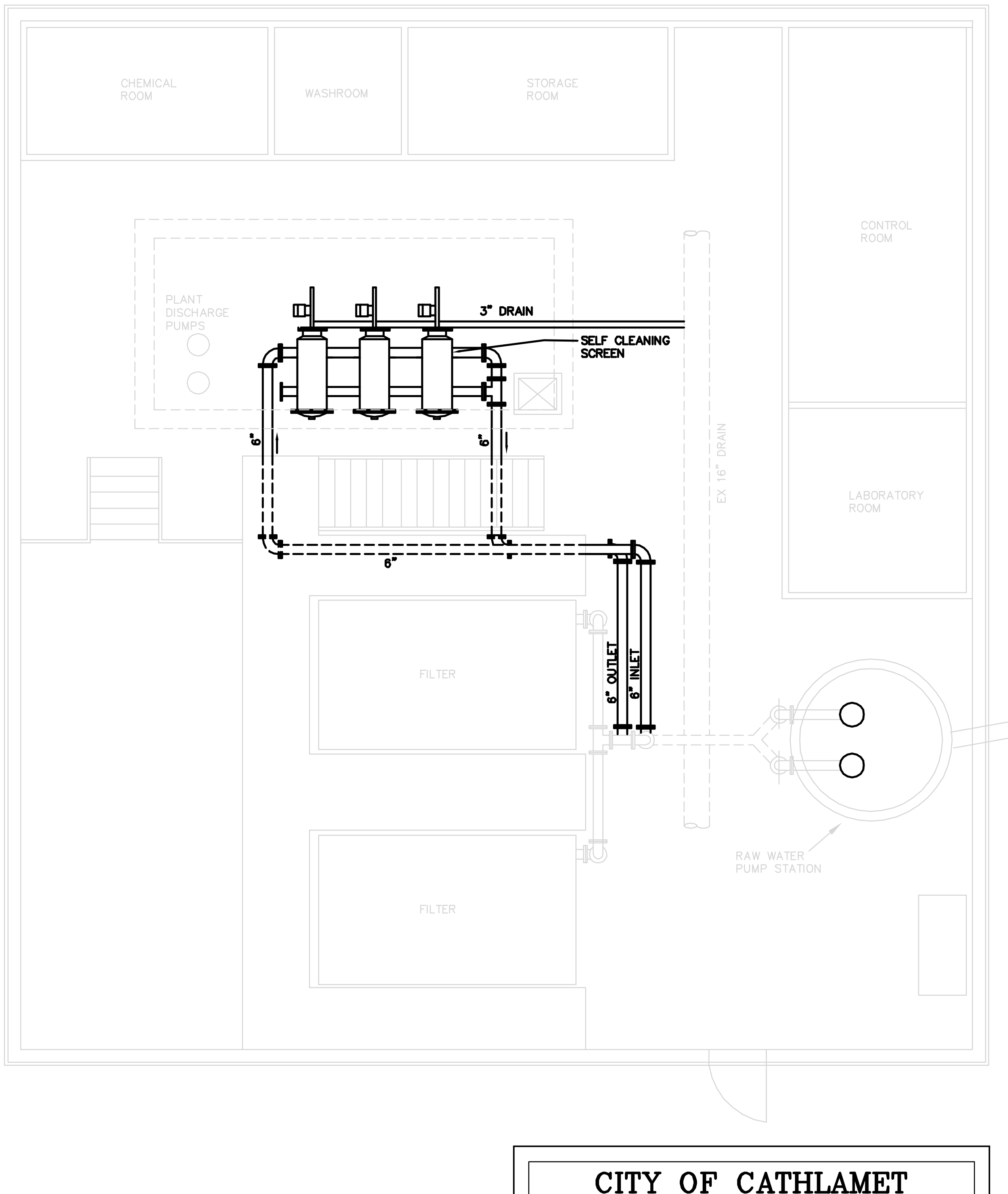
TOWN OF CATHLAMET

PULSED BLANKET CLARIFIER

FIGURE 2–10

Gray & Osborne, Inc.

CONSULTING ENGINEERS



CITY OF CATHLAMET

FINE SCREENS

FIGURE 2–11

Gray & Osborne, Inc.
CONSULTING ENGINEERS

unit. Because of this limitation, dissolved air flotation was not considered further in this evaluation.

Table 2-7 summarizes the estimated capital costs for all of the Pre-Treatment Alternatives.

TABLE 2-7

Pre-Treatment Alternative
Capital Cost Estimate Summary

Alternative	Estimated Capital Cost
Settling Basin	$320,000
Tube Settler	$291,000
Inclined Plate Settler	$397,000
Solids Contact Clarifier	$418,000
Pulsed Blanket Clarifier	$751,000
Self Cleaning Fine Screen	$288,000

All of the above alternatives would also require modifications to the Town's water intake to effectively solve the Town's intake problems.

CHAPTER 3

EVALUATION AND RECOMMENDATIONS

ALTERNATIVE EVALUATION

In this chapter, the alternatives that were identified in Chapter 2 are evaluated using cost and non-cost criteria. The best alternative from each category of alternatives is selected first followed by an evaluation of the best alternative from each category.

PROVIDE ADDITIONAL STORAGE ALTERNATIVES

Chapter 2 presented two (2) alternatives for constructing additional finished water storage. The first alternative, construct a 500,000 gallon reservoir, would provide 3.7 days of storage at average day demands in 2005 and 2.6 days of storage in 2020 at average day demands. This alternative would not provide the Town with a sufficient quantity of water to stop operating the water treatment plant through a five (5) day high turbidity event as was experienced in 1999. The second alternative, construct a 1,000,000 gallon reservoir would allow the Town to serve water demands off storage throughout a five (5) day high turbidity event. As a result, the 1,000,000 gallon reservoir will be used to compare against the other categories of alternatives.

MODIFY/REPLACE THE EXISTING INTAKE ALTERNATIVES

Alternatives for modifying or replacing the existing raw water intake were presented in Chapter 2. Each alternative has advantages and disadvantages that make it more or less attractive than the others. To determine the most appropriate alternative for the Town of Cathlamet, a decision matrix was developed. The decision matrix provides a basis for evaluating the monetary and non-monetary considerations associated with each alternative. The following factors were considered in the evaluation:

1. **Capital Cost** - Alternatives were rated based upon estimated total project cost including design, construction management, and 20 percent contingency.

2. **Probability of Success** – Alternatives were rated based upon the likelihood of the project completely solving the Town's water intake problem.

3. **Reliability** – Alternatives were rated based upon their ability to solve the Town's water intake problems under all conditions. Alternatives that have mechanical equipment that might fail or have the potential to be damaged would rate lower than other alternatives.

4. **Operational Requirements** – Alternatives were rated based upon the amount of labor or energy required to operate them to successfully maintain a supply of water to the water treatment plant.

5. **Permit Requirements** - Since certain environmental permits add time or expense to a project, the alternatives were rated by the extent of permitting that would be required to complete them.

Each of the above considerations was given an importance factor. Capital cost was deemed the most important since the Town just completed a large public works project to build the treatment facility. Probability of success and reliability were the next most important considerations since the investment of capital funds should reliably solve the problem. Operational requirements and permit requirements were the final considerations.

For each consideration, the alternatives were rated from 1 to 10 with 10 being the best and 1 being the worst. The rating was then multiplied by the importance factor for each item and the total summed together to provide a rating for each alternative. A perfect rating would equal 1,000. The decision matrix is shown in Table 3-1.

TABLE 3-1

Modify/Replace Raw Water Intake Alternative Decision Matrix

	Capital Cost	Probability of Success	Reliability	Operational Requirements	Permit Requirements	Total
Importance Factor	40	20	20	15	5	100
Existing Intake Modifications	10	7	6	4	10	770
Surface Water Intake	8	4	4	5	4	575
Infiltration Gallery	3	9	9	7	3	600
Ranney Well	1	9	9	7	8	545
Shallow Wells	2	4	10	10	7	545

As shown in Table 3-1, the alternative for modifying the existing intake rated high for capital cost since it is the least expensive alternative. This alternative rated in the middle for probability of success since only the flushing mechanisms will be modified and solids may still enter the intake. This alternative also rated in the middle for reliability and operational considerations since it will require mechanical equipment and some operator attention to function properly. This alternative rated high for permit requirements since no work would be accomplished in the river.

The surface water intake rated lower for probability of success due to the possibility of poorer quality water being generated from a surface intake. It is also uncertain whether adequate water depth exists to keep the intake submerged without having the river bed impact the screen. The surface intake rated low in reliability and operational requirements due to the need to keep the screen clear of debris and the possibility of damage to the intake due to large debris in the river. The surface intake also rated low on permit requirements because work in the river bed would require an Hydraulic Project Approval and possibly a biological assessment if federal permits or funds are required.

The infiltration gallery intake rated high for probability of success since a properly designed infiltration gallery screen would likely maintain or slightly improve water quality while eliminating the capacity problems currently experienced. This alternative rated high for reliability since mechanical equipment would not be required to keep it functional. Operational requirements for this alternative were in the middle of the pack since some periodic cleaning of the laterals might be required. This alternative rated the lowest for permit requirements, since the entire river bed would be disturbed during construction. This alternative would require the same permits as the surface water intake alternative but the permits would be more difficult to obtain.

The Ranney Well alternative rated high for probability of success due to its successful application in many other locations in Southwest Washington. As with the infiltration gallery, water quality would likely maintain or improve slightly with this alternative while eliminating the capacity problems. Reliability for this alternative was also high since mechanical equipment would not be required to keep it functional. Operational requirements were in the middle of the alternatives since some periodic cleaning of the laterals would be required. The Ranney Well alternative rated higher for permit requirements since no open cut work would be necessary in the river bed.

The shallow well alternative rated the lowest for probability of success due to the uncertainty associated with the development of groundwater resources. This alternative rated high for reliability since, once developed, wells provide consistent high quality water sources. Shallow wells rated the highest for operational requirements since very little maintenance is required to keep them operational. This alternative rated in the middle for permit requirements since it is possible that a water rights transfer might be required to utilize shallow wells as a water source.

Based upon all of these factors, the decision matrix shows that modifying the existing intake would be the most appropriate alternative for the Town of Cathlamet. Since the shallow well alternative also rated highly and would likely not require a pre-treatment alternative associated with it, the shallow well alternative will also be considered in the evaluation of the overall best alternative.

PRE-TREATMENT ALTERNATIVES

Alternatives for pre-treatment of raw water prior to the existing filtration plant were presented in Chapter 2. Each alternative has advantages and disadvantages that make it more or less attractive than the others. To determine the most appropriate pre-treatment alternative for the Town of Cathlamet, a decision matrix was developed. This matrix is similar to that developed for the Intake Modification Alternatives. The factors considered in the evaluation were similar to those used for the Intake Alternatives Matrix except that Footprint was used in place of Permit Requirements. Since the water treatment plant site is quite small, the square footage required to construct the various pre-treatment alternatives is an important consideration. The decision matrix is shown in Table 3-2.

TABLE 3-2

Pre-Treatment Alternative Decision Matrix

	Capital Cost	Probability of Success	Reliability	Operational Requirements	Footprint	Total
Importance Factor	40	20	20	10	10	100
Settling Basin	9	7	9	8	4	800
Tube Settlers	10	7	9	8	7	870
Inclined Plate Settler	7	9	9	8	8	800
Solids Contact Clarifier	7	9	8	7	4	730
Pulsed Blanket Clarifier	4	9	7	6	6	600
Fine Screen	10	5	8	5	10	810

The settling basin and tube settler alternative rated the same for several criteria. They rated lower for probability of success since treated water quality would likely be less than for other alternatives due to the lack of coagulation and flocculation upstream of these alternatives. The reliability of these alternative was high since there would be no moving parts associated with them. Operational requirements were moderate since some operator effort would be required to clean out the basins periodically. The footprint for the tube settlers was significantly better than for the settling basin due to the higher loading rate that can be used with the tube settlers.

The inclined plate settler rated highly for probability of success since the use of coagulation and flocculation upstream of this equipment should ensure adequate water quality is provided to the filters. This alternative also rated high for reliability due to the lack of moving parts. Operational requirements for this alternative were similar to the settling basin and tube settlers since some operator effort would be required to clean out the basins periodically. This alternative rated higher for footprint since it would fit inside the existing water treatment plant building.

The solids contact clarifier and the pulsed blanket clarifier had similar ratings for several categories. Both rated highly for probability of success due the ability to provide coagulation and flocculation of solids. Both alternatives rated in the middle for reliability due to the reliance on mechanical equipment to maintain the proper sludge blanket. Operational requirements were also lower since some operator attention would be required to maintain the equipment and additional power is required to maintain the sludge blanket. The footprint for these two (2) alternatives was similar with the solids contact clarifier being slightly larger than the pulsed blanket clarifier.

The fine screen alternative rated the lowest for probability of success due to the lack of raw water particle size data available to determine if it would be effective. This alternative rated in the middle for reliability since some mechanical equipment is necessary to backwash the screens. The fine screen alternative rated lowest on operational requirements since it would require more energy costs than any other alternative. This alternative rated the highest for footprint since it requires the least area and can be fit inside the existing water treatment plant building.

Based upon all of these factors, the decision matrix shows that tube settlers would be the most appropriate pre-treatment alternative for the Town of Cathlamet.

OVERALL ALTERNATIVE EVALUATION

To determine the most appropriate overall alternative for the Town of Cathlamet, the best alternative from each of the three (3) categories (plus shallow wells) was evaluated using similar criteria to the evaluations above. Footprint and permit requirements were not included in the evaluation since they were not pertinent to all of the alternatives. A decision matrix for the overall alternatives is included in Table 3-3.

TABLE 3-3

Overall Alternative Decision Matrix

	Capital Cost	Probability of Success	Reliability	Operational Requirements	Total
Importance Factor	40	30	15	15	100
Status Quo	10	2	3	4	565
1MG Reservoir	2	9	10	10	650
Intake Modification / Tube Settler	6	8	8	6	690
Shallow Wells	7	4	10	9	685

As shown in Table 3-1, the Status Quo alternative rated highly for capital cost but low for each of the other criteria due to the current difficulties associated with producing water during high turbidity events. The 1 MG reservoir rated the lowest on capital cost but highest on the other criteria since it avoids trying to deal with treating water during these high turbidity periods. The intake modification/tube settler alternative rated in the middle of most categories. It has a fairly high probability of success since it improves both the intake and provides better pre-treatment. This alternative also is fairly reliable but would require more operator attention than storage or shallow wells. The shallow well alternative had a moderate capital cost and the lowest probability of success due to the uncertainty of developing a groundwater resource. If a groundwater resource could be developed, this alternative rates high for reliability and has low operational requirements.

RECOMMENDATIONS

Based upon the preceding evaluation, the recommended alternative for solving the Town of Cathlamet water intake problems includes modifications to the existing water intake and construction of a tube settler for pre-treatment prior the existing water treatment plant. This alternative would address both the intake capacity and water quality problems. Since the water quality problems occur so infrequently, the last time being in January 1999, it may be prudent to take an incremental approach to implementing these changes. The intake modifications could be undertaken first to ensure an adequate quantity of water is available to the water treatment plant. The estimated cost of the intake modifications is $74,000. The pre-treatment modifications could then be implemented later if experience shows that the new water plant has difficulty providing adequate treatment during high turbidity events. The estimated cost of adding the tube settler basin is $291,000.

The evaluation provided in this report has been based upon data currently available regarding water quality and the availability of ground water resources. With additional water quality data such as particle size distributions, the probability of success of alternatives such as the fine screen could be more accurately predicted. If additional investigation was conducted into the availability of groundwater at the site, the probability of success of this alternative could also be more accurately predicted, making it a more feasible alternative.

TOWN OF CATHLAMET
SETTLING BASIN
Cost Estimate
G&O #02304

NO.	ITEM	QUANTITY	UNIT PRICE	AMOUNT
1	Mobilization & Demobilization	1 LS	$ 20,000	$ 20,000
2	Clearing and Grubbing	1 LS	$ 2,500	$ 2,500
3	Erosion Control	1 LS	$ 1,500	$ 1,500
4	Locate Existing Utilities	1 LS	$ 1,500	$ 1,500
5	Trench Safety Systems	1 LS	$ 2,500	$ 2,500
6	Excavation, Backfill, Compaction	1 LS	$ 15,000	$ 15,000
7	Bank Run Gravel	120 TN	$ 18	$ 2,160
8	Foundation Gravel	60 CY	$ 25	$ 1,500
9	Miscellaneous Metals	1 LS	$ 25,000	$ 25,000
10	Painting	1 LS	$ 2,000	$ 2,000
11	Settling Basin	1 LS	$ 65,000	$ 65,000
12	Raw Water Pumps (350 gpm)	2 EA	$ 10,000	$ 20,000
13	Piping, Valves & Appurtenances	1 LS	$ 45,000	$ 45,000
14	Restoration	1 LS	$ 2,000	$ 2,000
15	Electrical	1 LS	$ 5,000	$ 5,000
Subtotal				$ 210,660
Sales Tax 7.5%				$ 15,800
Subtotal				$ 226,460
Contingencies (20%)				$ 45,292
Total Estimated Construction Cost				$ 255,952
Administration, Engineering & Construction Management (25%)				$ 63,988
Total Estimated Project Cost				**$ 320,000**

* Right-of-Way Acquisition may require additional costs.

TOWN OF CATHLAMET
TUBE SETTLERS
Cost Estimate
G&O #02304

NO.	ITEM	QUANTITY	UNIT PRICE		AMOUNT	
1	Mobilization & Demobilization	1 LS	$	18,000	$	18,000
2	Clearing and Grubbing	1 LS	$	2,000	$	2,000
3	Erosion Control	1 LS	$	1,500	$	1,500
4	Locate Existing Utilities	1 LS	$	1,500	$	1,500
5	Trench Safety Systems	1 LS	$	2,500	$	2,500
6	Excavation, Backfill, Compaction	1 LS	$	10,000	$	10,000
7	Bank Run Gravel	100 TN	$	18	$	1,800
8	Foundation Gravel	15 CY	$	25	$	375
9	Miscellaneous Metals	1 LS	$	15,000	$	15,000
10	Painting	1 LS	$	2,000	$	2,000
11	Tube Settlers	1 LS	$	30,000	$	30,000
12	Tube Settler Basin	1 LS	$	40,000	$	40,000
13	Raw Water Pumps (350 gpm)	2 EA	$	10,000	$	20,000
14	Piping, Valves & Appurtenances	1 LS	$	40,000	$	40,000
15	Restoration	1 LS	$	2,000	$	2,000
16	Electrical	1 LS	$	5,000	$	5,000
Subtotal					$	191,675
Sales Tax 7.5%					$	14,376
Subtotal					$	206,051
Contingencies (20%)					$	41,210
Total Estimated Construction Cost					$	232,885
Administration, Engineering & Construction Management (25%)					$	58,221
Total Estimated Project Cost					**$**	**291,000**

TOWN OF CATHLAMET
INCLINED PLATE SETTLER
Cost Estimate
G&O #02304

NO.	ITEM	QUANTITY	UNIT PRICE	AMOUNT
1	Mobilization & Demobilization	1 LS	$ 26,000	$ 26,000
2	Reinforced Concrete Pad	15 CY	$ 450	$ 6,750
3	Miscellaneous Metals	1 LS	$ 7,500	$ 7,500
4	Painting	1 LS	$ 6,000	$ 6,000
5	Westech Inclined Plate Settler	1 LS	$ 135,000	$ 135,000
6	Raw Water Pumps (350 gpm)	2 EA	$ 10,000	$ 20,000
7	Piping, Valves & Appurtenances	1 LS	$ 30,000	$ 30,000
8	Clearwell Reinforcing	1 LS	$ 10,000	$ 10,000
9	Clearwell Access Hatch Relocation	1 LS	$ 5,000	$ 5,000
10	Electrical	1 LS	$ 15,000	$ 15,000
Subtotal				$ 261,250
Sales Tax 7.5%				$ 19,594
Subtotal				$ 280,844
Contingencies (20%)				$ 56,169
Total Estimated Construction Cost				$ 317,419
Administration, Engineering & Construction Management (25%)				$ 79,355
Total Estimated Project Cost				**$ 397,000**

TOWN OF CATHLAMET
SOLIDS CONTACT CLARIFIER
Cost Estimate
G&O #02304

NO.	ITEM	QUANTITY	UNIT PRICE	AMOUNT
1	Mobilization & Demobilization	1 LS	$ 27,000	$ 27,000
2	Clearing and Grubbing	1 LS	$ 2,000	$ 2,000
3	Erosion Control	1 LS	$ 1,500	$ 1,500
4	Locate Existing Utilities	1 LS	$ 1,500	$ 1,500
5	Trench Safety Systems	1 LS	$ 1,000	$ 1,000
6	Excavation, Backfill, Compaction	1 LS	$ 12,000	$ 12,000
7	Bank Run Gravel	100 TN	$ 18	$ 1,800
8	Foundation Gravel	75 CY	$ 25	$ 1,875
9	Reinforced Concrete	55 CY	$ 450	$ 24,750
10	Miscellaneous Metals	1 LS	$ 10,000	$ 10,000
11	Painting	1 LS	$ 5,000	$ 5,000
12	Solid Contact Clarifer (32' Dia)	1 LS	$ 110,000	$ 110,000
13	Raw Water Pumps (350 gpm)	2 EA	$ 10,000	$ 20,000
14	Piping, Valves & Appurtenances	1 LS	$ 35,000	$ 35,000
15	Restoration	1 LS	$ 2,000	$ 2,000
16	Electrical	1 LS	$ 20,000	$ 20,000
Subtotal				$ 275,425
Sales Tax 7.5%				$ 20,657
Subtotal				$ 296,082
Contingencies (20%)				$ 59,216
Total Estimated Construction Cost				$ 334,641
Administration, Engineering & Construction Management (25%)				$ 83,660
Total Estimated Project Cost				**$ 418,000**

* Right-of-Way Acquisition may required additional costs.

TOWN OF CATHLAMET
PULSED BLANKET CLARIFER
Cost Estimate
G&O #02304

NO.	ITEM	QUANTITY	UNIT PRICE		AMOUNT	
1	Mobilization & Demobilization	1 LS	$	43,000	$	43,000
2	Clearing and Grubbing	1 LS	$	2,000	$	2,000
3	Erosion Control	1 LS	$	1,500	$	1,500
4	Locate Existing Utilities	1 LS	$	1,500	$	1,500
5	Trench Safety Systems	1 LS	$	1,000	$	1,000
6	Excavation, Backfill, Compaction	1 LS	$	10,000	$	10,000
7	Bank Run Gravel	80 TN	$	18	$	1,440
8	Foundation Gravel	60 CY	$	25	$	1,500
9	Reinforced Concrete	45 CY	$	450	$	20,250
10	Miscellaneous Metals	1 LS	$	15,000	$	15,000
11	Painting	1 LS	$	5,000	$	5,000
12	Sludge Blanket Clarifer	1 LS	$	300,000	$	300,000
13	Raw Water Pumps (350 gpm)	2 EA	$	10,000	$	20,000
14	Piping, Valves & Appurtenances	1 LS	$	40,000	$	40,000
15	Restoration	1 LS	$	2,000	$	2,000
16	Electrical	1 LS	$	30,000	$	30,000
Subtotal					$	494,190
Sales Tax 7.5%					$	37,064
Subtotal					$	531,254
Contingencies (20%)					$	106,251
Total Estimated Construction Cost					$	600,441
Administration, Engineering & Construction Management (25%)					$	150,110
Total Estimated Project Cost					**$**	**751,000**

* Right-of-Way Acquisition may required additional costs.

TOWN OF CATHLAMET
FINE SCREENS
Cost Estimate
G&O #02304

NO.	ITEM	QUANTITY	UNIT PRICE	AMOUNT
1	Mobilization & Demobilization	1 LS	$ 20,000	$ 20,000
2	Reinforced Concrete Pad	10 CY	$ 450	$ 4,500
3	Miscellaneous Metals	1 LS	$ 5,000	$ 5,000
4	Painting	1 LS	$ 5,000	$ 5,000
5	Package Amiad Fine Screen Filter	1 LS	$ 80,000	$ 80,000
6	Raw Water Pumps (350 gpm)	2 EA	$ 12,500	$ 25,000
7	Piping, Valves & Appurtenances	1 LS	$ 30,000	$ 30,000
8	Clearwell Reinforcing	1 LS	$ 5,000	$ 5,000
9	Electrical	1 LS	$ 15,000	$ 15,000
Subtotal				$ 189,500
Sales Tax 7.5%				$ 14,213
Subtotal				$ 203,713
Contingencies (20%)				$ 40,743
Total Estimated Construction Cost				$ 230,243
Administration, Engineering & Construction Management (25%)				$ 57,561
Total Estimated Project Cost				**$ 288,000**

TOWN OF CATHLAMET
EXISTING INTAKE MODIFICATIONS
Cost Estimate
G&O #02304

NO.	ITEM	QUANTITY	UNIT PRICE	AMOUNT
1	Mobilization & Demobilization	1 LS	$ 5,000	$ 5,000
2	Clearing and Grubbing	1 LS	$ 800	$ 800
3	Erosion Control	1 LS	$ 1,200	$ 1,200
4	Locate Existing Utilities	1 LS	$ 750	$ 750
5	Trench Safety Systems	1 LS	$ 1,000	$ 1,000
6	Excavation, Backfill, Compaction	1 LS	$ 2,500	$ 2,500
7	Bank Run Gravel	20 TN	$ 18	$ 360
8	Foundation Gravel	10 CY	$ 25	$ 250
9	Intake Cleaning	1 LS	$ 3,000	$ 3,000
10	Reduced Pressure Backflow Preventor	1 LS	$ 2,500	$ 2,500
11	Flowmeter	1 LS	$ 1,500	$ 1,500
12	Dechlorination Equipment	1 LS	$ 3,000	$ 3,000
13	Raw Water PS Solids Pump	1 LS	$ 3,000	$ 3,000
14	Piping, Valves & Appurtenances	1 LS	$ 15,000	$ 15,000
15	Restoration	1 LS	$ 1,000	$ 1,000
16	Electrical	1 LS	$ 5,000	$ 5,000
17	Telemetry and Control Modifications	1 LS	$ 3,000	$ 3,000
Subtotal				$ 48,860
Sales Tax 7.5%				$ 3,665
Subtotal				$ 52,525
Contingencies (20%)				$ 10,505
Total Estimated Construction Cost				$ 59,365
Administration, Engineering & Construction Management (25%)				$ 14,841
Total Estimated Project Cost				**$ 74,000**

TOWN OF CATHLAMET
SURFACE WATER INTAKE
Cost Estimate
G&O #02304

NO.	ITEM	QUANTITY	UNIT PRICE		AMOUNT	
1	Mobilization & Demobilization	1 LS	$	7,000	$	7,000
2	Clearing and Grubbing	1 LS	$	750	$	750
3	Erosion Control	1 LS	$	1,000	$	1,000
4	Locate Existing Utilities	1 LS	$	500	$	500
5	Trench Safety Systems	1 LS	$	3,000	$	3,000
6	Cofferdam	1 LS	$	5,000	$	5,000
7	Excavation, Backfill, Compaction	1 LS	$	15,000	$	15,000
8	Concrete Anchor Blocks	6 EA	$	300	$	1,800
9	Quarry Spalls	50 CY	$	30	$	1,500
10	Piping, Valves & Appurtenances	1 LS	$	20,000	$	20,000
11	Intake Screen	3 EA	$	2,000	$	6,000
12	Restoration	1 LS	$	2,500	$	2,500
Subtotal					$	64,050
Sales Tax 7.5%					$	4,804
Subtotal					$	68,854
Contingencies (20%)					$	13,771
Total Estimated Construction Cost					$	77,821
Administration, Engineering & Construction Management (25%)					$	19,455
Total Estimated Project Cost					**$**	**97,000**

TOWN OF CATHLAMET
NEW INFILTRATION GALLERY
Cost Estimate
G&O #02304

NO.	ITEM	QUANTITY	UNIT PRICE		AMOUNT	
1	Mobilization & Demobilization	1 LS	$	19,000	$	19,000
2	Clearing and Grubbing	1 LS	$	1,500	$	1,500
3	Erosion Control	1 LS	$	2,000	$	2,000
4	Locate Existing Utilities	1 LS	$	750	$	750
5	Trench Safety Systems	1 LS	$	1,200	$	1,200
6	Excavation, Backfill, Compaction	1 LS	$	30,000	$	30,000
7	Cofferdams	1 LS	$	50,000	$	50,000
8	Bank Run Gravel	100 TN	$	18	$	1,800
9	Foundation Gravel	35 CY	$	25	$	875
10	Rip Rap	150 TN	$	30	$	4,500
11	Concrete Anchor Blocks	12 EA	$	300	$	3,600
12	6' Dia Manholes	4 EA	$	4,000	$	16,000
13	Piping, Valves & Appurtenances	1 LS	$	30,000	$	30,000
14	Slotted Well Screen	1 LS	$	15,000	$	15,000
15	Restoration	1 LS	$	5,000	$	5,000
Subtotal					$	181,225
Sales Tax 7.5%						13,592
Subtotal					$	194,817
Contingencies (20%)					$	38,963
Total Estimated Construction Cost					$	220,188
Administration, Engineering & Construction Management (25%)					$	55,047
Total Estimated Project Cost					**$**	**275,000**

TOWN OF CATHLAMET
0.5 MG RESERVOIR
Cost Estimate
G&O #02304

NO.	ITEM	QUANTITY		UNIT PRICE		AMOUNT
1	Mobilization & Demobilization	1 LS	$	45,000	$	45,000
2	Clearing and Grubbing	1 LS	$	1,500	$	1,500
3	Erosion Control	1 LS	$	1,500	$	1,500
4	Locate Existing Utilities	1 LS	$	1,500	$	1,500
5	Trench Safety Systems	1 LS	$	1,000	$	1,000
6	Excavation, Backfill, Compaction	1 LS	$	10,000	$	10,000
7	Foundation Gravel	75 CY	$	25	$	1,875
8	Crushed Surfacing Top Course	150 TN	$	18	$	2,700
9	Crushed Surfacing Base Course	1000 TN	$	18	$	18,000
10	Asphalt Pavement	50 TN	$	80	$	4,000
11	Reinforced Concrete	120 CY	$	450	$	54,000
12	Miscellaneous Metals	1 LS	$	8,000	$	8,000
13	Painting	1 LS	$	35,000	$	35,000
14	0.5 MG Reservoir	1 LS	$	150,000	$	150,000
15	Piping, Valves & Appurtenances	1 LS	$	60,000	$	60,000
16	Restoration	1 LS	$	4,000	$	4,000
17	Electrical, Telemetry and Instrumentation	1 LS	$	15,000	$	15,000
Subtotal					$	413,075
Sales Tax 7.5%					$	30,981
Subtotal					$	444,056
Contingencies (20%)					$	88,811
Total Estimated Construction Cost					$	501,886
Administration, Engineering & Construction Management (25%)					$	125,472
Total Estimated Project Cost					**$**	**627,000**

TOWN OF CATHLAMET
1 MG RESERVOIR
Cost Estimate
G&O #02304

NO.	ITEM	QUANTITY	UNIT PRICE	AMOUNT
1	Mobilization & Demobilization	1 LS	$ 70,000	$ 70,000
2	Clearing and Grubbing	1 LS	$ 2,000	$ 2,000
3	Erosion Control	1 LS	$ 1,500	$ 1,500
4	Locate Existing Utilities	1 LS	$ 1,500	$ 1,500
5	Trench Safety Systems	1 LS	$ 1,000	$ 1,000
6	Excavation, Backfill, Compaction	1 LS	$ 15,000	$ 15,000
7	Foundation Gravel	75 CY	$ 25	$ 1,875
8	Crushed Surfacing Top Course	200 TN	$ 18	$ 3,600
9	Crushed Surfacing Base Course	1250 TN	$ 18	$ 22,500
10	Asphalt Pavement	100 TN	$ 80	$ 8,000
11	Reinforced Concrete	120 CY	$ 450	$ 54,000
12	Miscellaneous Metals	1 LS	$ 8,000	$ 8,000
13	Painting	1 LS	$ 50,000	$ 50,000
14	1 MG Reservoir	1 LS	$ 290,000	$ 290,000
15	Piping, Valves & Appurtenances	1 LS	$ 75,000	$ 75,000
16	Restoration	1 LS	$ 5,000	$ 5,000
17	Electrical, Telemetry and Instrumentation	1 LS	$ 15,000	$ 15,000
Subtotal				$ 623,975
Sales Tax 7.5%				$ 46,798
Subtotal				$ 670,773
Contingencies (20%)				$ 134,155
Total Estimated Construction Cost				$ 758,130
Administration, Engineering & Construction Management (25%)				$ 189,532
Total Estimated Project Cost				**$ 948,000**

TOWN OF CATHLAMET
RANNEY WELL COLLECTOR
Cost Estimate
G&O #02304

NO.	ITEM	QUANTITY	UNIT PRICE		AMOUNT	
1	Mobilization & Demobilization	1 LS	$	65,000	$	65,000
2	Clearing and Grubbing	1 LS	$	750	$	750
3	Erosion Control	1 LS	$	1,000	$	1,000
4	Locate Existing Utilities	1 LS	$	500	$	500
5	Trench Safety Systems	1 LS	$	1,000	$	1,000
6	Excavation, Backfill, Compaction	1 LS	$	30,000	$	30,000
7	Bank Run Gravel	10 TN	$	18	$	180
8	Foundation Gravel	5 CY	$	25	$	125
9	12' Dia Ranney Well	1 LS	$	200,000	$	200,000
10	10" Laterals	375 LF	$	500	$	187,500
11	Piping, Valves & Appurtenances	1 LS	$	10,000	$	10,000
12	Restoration	1 LS	$	1,000	$	1,000
Subtotal					$	497,055
Sales Tax 7.5%					$	37,279
Subtotal					$	534,334
Contingencies (20%)					$	106,867
Total Estimated Construction Cost					$	603,922
Administration, Engineering & Construction Management (25%)					$	150,980
Total Estimated Project Cost					**$**	**755,000**

TOWN OF CATHLAMET
SHALLOW WELLS
Cost Estimate
G&O #02304

Preliminary

NO.	ITEM	QUANTITY	UNIT PRICE	AMOUNT
1	Hydrogeologic Investigation	1 LS	$ 35,000	$ 35,000
2	Test Well	1 LS	$ 35,000	$ 35,000
Total Preliminary Cost				$ 70,000

Production Well

NO.	ITEM	QUANTITY	UNIT PRICE	AMOUNT
1	Mobilization & Demobilization	1 LS	$ 16,000	$ 16,000
2	Clearing and Grubbing	1 LS	$ 1,200	$ 1,200
3	Erosion Control	1 LS	$ 1,000	$ 1,000
4	Locate Existing Utilities	1 LS	$ 1,000	$ 1,000
5	Trench Safety Systems	1 LS	$ 1,000	$ 1,000
6	Excavation, Backfill, Compaction	1 LS	$ 5,000	$ 5,000
7	Bank Run Gravel	70 TN	$ 18	$ 1,260
8	Foundation Gravel	15 CY	$ 25	$ 375
9	Drill, Equip and Test Well	2 EA	$ 40,000	$ 80,000
10	Piping, Valves & Appurtenances	1 LS	$ 30,000	$ 30,000
11	Electrical	1 LS	$ 15,000	$ 15,000
12	Restoration	1 LS	$ 1,500	$ 1,500
Subtotal				$ 153,335
Sales Tax 7.5%				$ 11,500
Subtotal				$ 164,835
Contingencies (20%)				$ 32,967
Total Estimated Construction Cost				$ 186,302
Administration, Engineering & Construction Management (25%)				$ 46,576
Total Production Well Project Cost				$ 232,900
Total Estimated Project Cost				**$ 303,000**

APPENDIX M

FOREST PRACTICES ACT FAQ

Forest Practices Reviewer Profile and Email Notification Frequently Asked Questions

(April 18, 2014)

1. When is a Forest Practices Application/Notification (FPA/N) required?

A Forest Practices Application/Notification (FPA/N) form may be required for any of the following activities on forest land:

- harvesting timber,
- salvaging logs, stumps, or snags,
- constructing forest roads,
- installing or replacing culverts or bridges on forest roads, or conducting any work in or over typed water,
- constructing or expanding gravel pits on forest land for forestry use, or
- using aircraft to apply chemicals

2. How can I review FPA/Ns online?

There are two ways to review FPA/Ns online:

a. subscribe to the Forest Practices Application Review System (FPARS), or
b. use the FPA/N Search Tool (https://fortress.wa.gov/dnr/fparssearch/)

3. What is the Forest Practices Application Review System (FPARS)?

The Forest Practices Application Review System (FPARS) is a modular computer program that streamlines processing FPA/Ns and improves the public's ability to review proposed forest practices activities.

FPARS makes use of the Internet and email, document imaging technology, interactive geographic information system technology, and the Oracle database system to provide collection of FPA/N information, distribution of FPA/Ns for regulatory and public review, risk assessment of proposed FPA/N activities, and archiving FPA/Ns.

4. How do I sign-up to receive email notification of FPA/Ns for review?

a. Complete and submit the Forest Practices Reviewer Profile form (http://www.dnr.wa.gov/Publications/fp_reviewer_profile_form.pdf),
b. Create a Secure Access Washington (SAW) account (http://www.dnr.wa.gov/Publications/fp_reviewer_notification_tutorial.pdf), and
c. Subscribe to the Forest Practices Reviewer Profile service (also covered in the reviewer notification tutorial).

5. Do I need a FPARS profile to review forest practices applications?

No. The FPA/N Search Tool (https://fortress.wa.gov/dnr/fparssearch/) is free to the public and can be used without a reviewer profile, user ID or password.

Forest Practices Division | Washington State Department of Natural Resources | 1111 Washington St. SE | MS 47012 | Olympia, WA 98504-7012
Phone 360-902-1400

6. What is Secure Access Washington (SAW)?

SecureAccess Washington is a single sign-on application gateway created by Washington State's Department of Information Services to simplify access to the growing list of government services accessible via the Internet.

SecureAccess Washington allows Internet access to multiple online government services with the use of a unique single self-generated User-ID and password. Once signed in, users have the ability to change their password and register for access to various online government services.

7. Why do I need a SAW account?

Secure Access Washington (SAW) authenticates user IDs and passwords and provides access to the Forest Practices Reviewer Profile notification service.

8. What is the FPA/N Search Tool?

The FPA/N Search Tool is a web-based application that allows the user to input between one and ten FPA/N numbers. The user can also enter advanced search parameters such as geography and forest practices activity type. The output is a list of FPA/N numbers and a link from each to the document on the Internet.

9. Do I need a user ID and password to use the FPA/N Search Tool?

No. The FPA/N Search Tool (https://fortress.wa.gov/dnr/fparssearch/) is free to the public and does not require a user ID or password.

10. When did the Department of Natural Resources (DNR) begin posting copies of FPA/Ns to the Internet and notifying reviewers by email?

October 28, 2002.

11. What parts of the FPA/N are not scanned for public review?

Any worksheet or map that identifies the specific location of cultural resources or the nesting, roosting or den sites of threatened or endangered species ARE NOT SCANNED and ARE NOT DISTRIBUTED for public review.

12. Where can I learn more about FPARS and reviewer notification?

You can learn more about FPARS and FPA/N reviewer notification by visiting the FPARS website at http://www.dnr.wa.gov/BusinessPermits/Topics/ForestPracticesApplications/Pages/fp_fpars.aspx. You can also contact the Forest Practices Help Desk by email at email fpars-admin@dnr.wa.gov or call the help desk at (360) 902-1420.

APPENDIX N

SAMPLE BOIL WATER NOTICE

Your logo or company name here.

News Release

For Immediate Release: <DATE>
Contact: Water purveyor/system contact name and telephone number

<Water System> announces boil water advisory for all customers in <area>

CITY NAME – The <SYSTEM NAME> is advising all water customers to boil their drinking water after recent samples showed the presence of *E. coli*. The Washington State Department of Health (DOH) has been notified and <SYSTEM NAME> is working closely with the Office of Drinking Water to find the source of contamination and fix the problem, which may include disinfecting the system. The boil water advisory will remain in effect until further notice.

(Sample quote) "We are doing all we can to eliminate the bacteria from the water system. Safe and reliable drinking water is critical to good health and responding to this kind of emergency is our highest priority," said <System spokesperson>.

<NUMBER or NO> illnesses related to the community's drinking water have been reported. To correct the problem <WHAT IS BEING DONE> (e.g. Chlorine was applied to the entire system on DATE.)

The boil water advisory includes several precautionary steps for customers. These include using purchased bottled water or boiled water for drinking, brushing teeth, dishwashing, preparing food, and making ice. Water should come to a roiling boil for one minute, then cool to an appropriate temperature before using.

The advisory will remain in effect until <SYSTEM NAME> and DOH are confident the water is safe. When satisfactory results are reported, customers will be notified that the advisory has been lifted.

If you have questions, please call us at <TELEPHONE NUMBER>.

###

APPENDIX O

FOLLOW-UP TO AN UNSATISFACTORY ROUTINE COLIFORM SAMPLE

Fact Sheet

April 2016
DOH 331-187
Revised

Follow-up to an unsatisfactory routine coliform sample

A drinking water sample is unsatisfactory whenever coliform bacteria are present. If your water system receives unsatisfactory sample results, you must collect a set of repeat samples. If your water system uses groundwater, you must also collect triggered source samples from every groundwater source that was in use when you collected the unsatisfactory routine sample. You must collect triggered source samples before treatment. If your water system has an approved triggered monitoring plan, follow your plan.

Repeat samples confirm the presence or absence of coliform bacteria in the system. If present, sample results can help you find the possible cause of contamination.

Triggered source samples indicate whether the groundwater source is contaminated with the fecal indicator *E. coli* bacteria.

You must collect repeat and triggered source samples within 24 hours after you learn about the unsatisfactory routine sample result. **Do not** shock-chlorinate the system or source before collecting any samples unless you have prior approval from us.

Review your sampling procedure

Review your sampling procedure to make sure you collect your samples correctly. For help, see *Coliform Sampling Procedure* (331-225).

Collect repeat samples

You *must* collect **THREE REPEAT** samples for every unsatisfactory ROUTINE sample. Three must come from the following locations:

1. The same tap as the original unsatisfactory routine sample.
2. An active service within 5 active connections upstream from the original unsatisfactory sample location.*
3. An active service within 5 active connections downstream from the original unsatisfactory sample location.*

You must also collect a raw water sample at each groundwater source that was in use when you collected the unsatisfactory routine sample and test it for *E. coli*.

* You may deviate from these locations if your state-approved Coliform Monitoring Plan includes one of the following:

- A standard operating procedure (SOP) for selecting alternate repeat sites.
- Defined alternate repeat site locations.

Thoroughly inspect your water system

Try to identify potential sources of contamination, such as "openings" in the system or treatment equipment failure. If you find obvious sources of contamination, call us (see below).

The month after an unsatisfactory sample

The month after an unsatisfactory routine sample, you must collect your usual number of ROUTINE samples from the distribution system.

Very small noncommunity groundwater systems not required to sample every month must collect ONE ROUTINE sample the month following an unsatisfactory sample even if they normally would not be required to collect a sample that month**.**

Call us if:

- You cannot sample as outlined above.
- You would like to discuss the triggered source sample requirement.
- Any repeat samples or triggered source samples are unsatisfactory.

Northwest Region: Kent	**Southwest Region: Tumwater**	**Eastern Region: Spokane Valley**
253-395-6750	360-236-3030	509-329-2100

Our publications are online at https://fortress.wa.gov/doh/eh/dw/publications/publications.cfm

PUBLIC HEALTH
ALWAYS WORKING FOR A SAFER AND
HEALTHIER WASHINGTON

APPENDIX P

SANITARY SURVEY

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

Sanitary Survey Compliance Report

Report Date: 04/14/2023

Water System

WS ID:	11850	**WS Name:**	CATHLAMET WATER DEPT	**Group:**	A	**Type:**	Comm
SMA Number:		**SMA Name:**		**Status:**	Active	**Total Connections:**	704
Next Survey Date:	2023	**Certified Operator:**	Jay Watson	**Region:**	SW	**County:**	WAHKIAKUM

Sanitary Survey

Survey Date:	08/29/2019	**Survey Type:**	DOH Surveyor	**Survey Letter Date:**	10/01/2019
Surveyor A:	NICK FITZGERALD	**Surveyor B:**	TERESA WALKER	**# of Days since Letter:**	1291

Comments:

Ltr date represents the email notification sent to WS. DM The dates in the final letter are different than the dates given in the email. Dates in ltr are 12-2-19

Associated Compliance Actions

Compliance Action Type	Issued Date	Status	DW Reference Number

Deficiencies (CAP = Corrective Action Plan)

Category	Directive	Comply By	CAP Received	CAP Due Date	Completed	Out of Compliance	Days Out of Compliance
Significant Deficiency	Provide an air gap on the water supply line to the filer aid day tank.	11/15/2019			11/21/2019	No	
Significant Finding	Submit photos of the reservoir hatch, vents and overflow outlets.	11/15/2019			11/21/2019	No	
Significant Finding	Secure a 24-mesh screen over the inlet piping to the air blowers supplying compressed air to the filter underdrain.	11/15/2019			11/21/2019	No	
Significant Finding	Seal the access hatch located inside the plant for the 54,000 gallon baffled clear well to keep dust, insects and other contaminants out.	11/15/2019			11/21/2019	No	
Significant Finding	Replace the reference standards for calibration of the benchtop turbidimeter (Hach 2100Q) that were out of date.	11/15/2019			10/18/2019	No	

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

Sanitary Survey Compliance Report

Report Date: 04/14/2023

Water System

WS ID:	11850	**WS Name:**	CATHLAMET WATER DEPT	**Group:**	A	**Type:**	Comm
SMA Number:		**SMA Name:**		**Status:**	Active	**Total Connections:**	704
Next Survey Date:	2023	**Certified Operator:**	Jay Watson	**Region:**	SW	**County:**	WAHKIAKUM

Sanitary Survey

Survey Date:	09/22/2016	**Survey Type:**	DOH Surveyor	**Survey Letter Date:**	10/18/2016
Surveyor A:	KAY ROTTELL	**Surveyor B:**	NANCY FEAGIN	**# of Days since Letter:**	2369

Comments:

Associated Compliance Actions

Compliance Action Type	Issued Date	Status	DW Reference Number
Directive	10/18/2016	Completed	2016-DIR-0921

Deficiencies (CAP = Corrective Action Plan)

Category	Directive	Comply By	CAP Received	CAP Due Date	Completed	Out of Compliance	Days Out of Compliance

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

Sanitary Survey Compliance Report

Report Date: 04/14/2023

Water System

WS ID:	11850	**WS Name:**	CATHLAMET WATER DEPT	**Group:**	A	**Type:**	Comm
SMA Number:		**SMA Name:**		**Status:**	Active	**Total Connections:**	704
Next Survey Date:	2023	**Certified Operator:**	Jay Watson	**Region:**	SW	**County:**	WAHKIAKUM

Sanitary Survey

Survey Date:	03/16/2010	**Survey Type:**	DOH Surveyor	**Survey Letter Date:**	07/09/2010
Surveyor A:	TERESA WALKER	**Surveyor B:**		**# of Days since Letter:**	4662

Comments:

Associated Compliance Actions

Compliance Action Type	Issued Date	Status	DW Reference Number

Deficiencies (CAP = Corrective Action Plan)

Category	Directive	Comply By	CAP Received	CAP Due Date	Completed	Out of Compliance	Days Out of Compliance

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

Sanitary Survey Compliance Report

Report Date: 04/14/2023

Water System

WS ID: 11850 **WS Name:** CATHLAMET WATER DEPT **Group:** A **Type:** Comm

SMA Number: **SMA Name:** **Status:** Active **Total Connections:** 704

Next Survey Date: 2023 **Certified Operator:** Jay Watson **Region:** SW **County:** WAHKIAKUM

Sanitary Survey

Survey Date: 09/27/2007 **Survey Type:** DOH Surveyor **Survey Letter Date:** 11/21/2007

Surveyor A: TERESA WALKER **Surveyor B:** **# of Days since Letter:** 5623

Comments:

Associated Compliance Actions

Compliance Action Type	Issued Date	Status	DW Reference Number

Deficiencies (CAP = Corrective Action Plan)

Category	Directive	Comply By	CAP Received	CAP Due Date	Completed	Out of Compliance	Days Out of Compliance

APPENDIX Q

PRELIMINARY COST ESTIMATES

TOWN OF CATHLAMET
PRELIMINARY COST ESTIMATE
Project D-4: Maple Street Extension

NO.	ITEM	QUANTITY	UNIT		UNIT PRICE		AMOUNT
1	Mobilization/Demobilization (10%)	1	LS	$	6,000.00	$	6,000
2	Traffic Control	1	LS	$	1,000.00	$	1,000
3	Clearing and Grubbing	1	LS	$	1,000.00	$	1,000
4	Trench Excavation Safety System	1	LS	$	600.00	$	600
5	Locate Existing Utilities	1	LS	$	1,000.00	$	1,000
6	Erosion Control	1	LS	$	800.00	$	800
7	Bank Run Gravel	122	CY	$	30.00	$	3,667
8	Foundation Material	37	TN	$	35.00	$	1,282
9	Crushed Surfacing	147	TN	$	30.00	$	4,400
10	Asphalt Concrete Pavement Class "B"	42	TN	$	120.00	$	5,011
11	Sawcutting	150	LF	$	3.00	$	450
12	Connect to Existing System	1	EA	$	2,000.00	$	2,000
13	8-inch PVC Pipe (incl. Bedding)	500	LF	$	50.00	$	25,000
14	8-Inch Resilient Seat Gate Valves	2	EA	$	1,800.00	$	3,600
15	Fire Hydrant Assembly	1	EA	$	5,500.00	$	5,500
16	Additional Fittings	150	LBS	$	3.00	$	450
	Subtotal:……………………………………………………………………………….					$	61,760
	Sales Tax (7.6%):…………………………………………………………………….					$	4,694
	Subtotal:……………………………………………………………………………….					$	66,454
	Contingency (20%):…………………………………………………………………..					$	13,290.71
	TOTAL ESTIMATED CONSTRUCTION COST:………………………………………					$	79,744
	Engineering and Administrative Costs (25%):……………………………………….					$	19,936.07
	TOTAL ESTIMATED PROJECT COST:………………………………………………					$	100,000

TOWN OF CATHLAMET
PRELIMINARY COST ESTIMATE
Project D-5: Jacobson Road Water Main Upsizing

NO.	ITEM	QUANTITY	UNIT		UNIT PRICE		AMOUNT
1	Mobilization/Demobilization (10%)	1	LS	$	29,000.00	$	29,000
2	Traffic Control	1	LS	$	34,000.00	$	34,000
3	Clearing and Grubbing	1	LS	$	5,000.00	$	5,000
4	Trench Excavation Safety System	1	LS	$	5,000.00	$	5,000
5	Locate Existing Utilities	1	LS	$	1,000.00	$	1,000
6	Erosion Control	1	LS	$	800.00	$	800
7	Bank Run Gravel	410	CY	$	30.00	$	12,300
8	Foundation Material	125	TN	$	35.00	$	4,375
9	Crushed Surfacing	196	TN	$	30.00	$	5,865
10	HMA Cl 1/2" PG 58H-22	450	TN	$	120.00	$	54,000
11	Sawcutting	3410	LF	$	3.00	$	10,230
12	Connect to Existing System	7	EA	$	2,000.00	$	14,000
13	8-inch PVC Pipe (incl. Bedding)	1700	LF	$	50.00	$	85,000
14	8-Inch Resilient Seat Gate Valves	17	EA	$	1,800.00	$	30,600
15	Fire Hydrant Assembly	4	EA	$	5,500.00	$	22,000
16	Additional Fittings	510	LBS	$	3.00	$	1,530
	Subtotal:………………………………………………………………………………….					$	314,700
	Sales Tax (7.6%):………………………………………………………………………….					$	23,917
	Subtotal:………………………………………………………………………………….					$	338,617
	Contingency (20%):………………………………………………………………………..					$	67,723.44
	TOTAL ESTIMATED CONSTRUCTION COST:………………………………………					$	406,341
	Engineering and Administrative Costs (25%):………………………………………					$	101,585.16
	TOTAL ESTIMATED PROJECT COST:………………………………………………					$	508,000

TOWN OF CATHLAMET
PRELIMINARY COST ESTIMATE
Project DE-1: Front Street Main Replacement

NO.	ITEM	QUANTITY	UNIT		UNIT PRICE		AMOUNT
1	Mobilization/Demobilization (10%)	1	LS	$	17,000.00	$	17,000
2	Traffic Control	1	LS	$	2,000.00	$	2,000
3	Clearing and Grubbing	1	LS	$	600.00	$	600
4	Trench Excavation Safety System	1	LS	$	2,500.00	$	2,500
5	Locate Existing Utilities	1	LS	$	4,800.00	$	4,800
6	Erosion Control	1	LS	$	4,800.00	$	4,800
7	Bank Run Gravel	310	CY	$	30.00	$	9,300
8	Foundation Material	100	TN	$	35.00	$	3,500
9	Crushed Surfacing	375	TN	$	30.00	$	11,250
10	Asphalt Concrete Pavement Class "B"	10	TN	$	150.00	$	1,500
11	Sawcutting	100	LF	$	3.00	$	300
12	Connect to Existing System	3	EA	$	4,000.00	$	12,000
13	8-inch PVC Pipe (incl. Bedding)	1240	LF	$	65.00	$	80,600
14	8-Inch Resilient Seat Gate Valves	4	EA	$	1,800.00	$	7,200
15	Fire Hydrant Assembly	2	EA	$	5,500.00	$	11,000
16	Water Service Connections	8	EA	$	1,500.00	$	12,000
17	Additional Fittings	500	LBS	$	3.50	$	1,750
18	Restoration	1	LS	$	6,000.00	$	6,000
	Subtotal:……………………………………………………………………………….					$	188,100
	Sales Tax (7.6%):…………………………………………………………………					$	14,296
	Subtotal:……………………………………………………………………………….					$	202,396
	Contingency (20%):………………………………………………………………..					$	40,479.12
	TOTAL ESTIMATED CONSTRUCTION COST:………………………………………					$	242,875
	Engineering and Administrative Costs (25%):……………………………………….					$	60,718.68
	TOTAL ESTIMATED PROJECT COST:………………………………………………					$	304,000

TOWN OF CATHLAMET
PRELIMINARY COST ESTIMATE
Project DE-2: Greenwood Street Main Replacement

NO.	ITEM	QUANTITY	UNIT		UNIT PRICE		AMOUNT
1	Mobilization/Demobilization (10%)	1	LS	$	18,000.00	$	18,000
2	Traffic Control	1	LS	$	1,800.00	$	1,800
3	Clearing and Grubbing	1	LS	$	600.00	$	600
4	Trench Excavation Safety System	1	LS	$	2,500.00	$	2,500
5	Locate Existing Utilities	1	LS	$	5,100.00	$	5,100
6	Erosion Control	1	LS	$	5,100.00	$	5,100
7	Bank Run Gravel	290	CY	$	30.00	$	8,700
8	Foundation Material	90	TN	$	35.00	$	3,150
9	Crushed Surfacing	350	TN	$	30.00	$	10,500
10	Asphalt Concrete Pavement Class "B"	20	TN	$	150.00	$	3,000
11	Sawcutting	200	LF	$	3.00	$	600
12	Connect to Existing System	2	EA	$	4,000.00	$	8,000
13	8-inch PVC Pipe (incl. Bedding)	1350	LF	$	65.00	$	87,750
14	8-Inch Resilient Seat Gate Valves	6	EA	$	1,800.00	$	10,800
15	Fire Hydrant Assembly	2	EA	$	5,500.00	$	11,000
16	Water Service Connections	8	EA	$	1,500.00	$	12,000
17	Additional Fittings	1000	LBS	$	3.50	$	3,500
18	Restoration	1	LS	$	6,000.00	$	6,000
	Subtotal:……………………………………………………………………………….					$	198,100
	Sales Tax (7.6%):…………………………………………………………………					$	15,056
	Subtotal:………………………………………………………………………………..					$	213,156
	Contingency (20%):…………………………………………………………………..					$	42,631.12
	TOTAL ESTIMATED CONSTRUCTION COST:………………………………………					$	255,787
	Engineering and Administrative Costs (25%):……………………………………….					$	63,946.68
	TOTAL ESTIMATED PROJECT COST:………………………………………………					$	320,000

TOWN OF CATHLAMET
PRELIMINARY COST ESTIMATE
Project DE-3: Greenwood Reservoir

NO.	ITEM	QUANTITY	UNIT		UNIT PRICE		AMOUNT
1	Mobilization/Demobilization (10%)	1	LS	$	15,000.00	$	15,000
2	Traffic Control	1	LS	$	3,600.00	$	3,600
3	Clearing and Grubbing	1	LS	$	1,200.00	$	1,200
4	Trench Excavation Safety System	1	LS	$	1,200.00	$	1,200
5	Locate Existing Utilities	1	LS	$	4,300.00	$	4,300
6	Erosion Control	1	LS	$	4,300.00	$	4,300
7	Bank Run Gravel	300	CY	$	30.00	$	9,000
8	Foundation Material	90	TN	$	35.00	$	3,150
9	Crushed Surfacing	360	TN	$	30.00	$	10,800
10	Connect to Existing System	2	EA	$	4,000.00	$	8,000
11	8-inch PVC Pipe (incl. Bedding)	1200	LF	$	65.00	$	78,000
12	8-Inch Resilient Seat Gate Valves	2	EA	$	1,800.00	$	3,600
13	Fire Hydrant Assembly	2	EA	$	5,500.00	$	11,000
14	Water Service Connections	6	EA	$	1,500.00	$	9,000
15	Additional Fittings	1000	LBS	$	3.50	$	3,500
16	Restoration	1	LS	$	1,200.00	$	1,200
	Subtotal:……………………………………………………………………………….					$	166,850
	Sales Tax (7.6%):……………………………………………………………………….					$	12,681
	Subtotal:……………………………………………………………………………….					$	179,531
	Contingency (20%):………………………………………………………………..					$	35,906.12
	TOTAL ESTIMATED CONSTRUCTION COST:………………………………………					$	215,437
	Engineering and Administrative Costs (25%):……………………………………….					$	53,859.18
	TOTAL ESTIMATED PROJECT COST:………………………………………………					$	270,000

TOWN OF CATHLAMET
PRELIMINARY COST ESTIMATE
Project DE-4: Crista Vista

NO.	ITEM	QUANTITY	UNIT		UNIT PRICE		AMOUNT
1	Mobilization/Demobilization (10%)	1	LS	$	50,000.00	$	50,000
2	Traffic Control	1	LS	$	9,000.00	$	9,000
3	Clearing and Grubbing	1	LS	$	3,000.00	$	3,000
4	Trench Excavation Safety System	1	LS	$	3,000.00	$	3,000
5	Locate Existing Utilities	1	LS	$	14,000.00	$	14,000
6	Erosion Control	1	LS	$	14,000.00	$	14,000
7	Bank Run Gravel	1050	CY	$	28.00	$	29,400
8	Foundation Material	310	TN	$	32.00	$	9,920
9	Crushed Surfacing	1250	TN	$	30.00	$	37,500
10	Connect to Existing System	2	EA	$	4,000.00	$	8,000
11	8-inch PVC Pipe (incl. Bedding)	4200	LF	$	65.00	$	273,000
12	8-Inch Resilient Seat Gate Valves	2	EA	$	1,800.00	$	3,600
13	Fire Hydrant Assembly	5	EA	$	5,500.00	$	27,500
14	Water Service Connections	30	EA	$	1,500.00	$	45,000
15	Additional Fittings	4500	LBS	$	3.50	$	15,750
16	Restoration	1	LS	$	3,000.00	$	3,000
	Subtotal:……………………………………………………………………………….					$	545,670
	Sales Tax (7.6%):………………………………………………………………….					$	41,471
	Subtotal:……………………………………………………………………………….					$	587,141
	Contingency (20%):………………………………………………………………..					$	117,428.18
	TOTAL ESTIMATED CONSTRUCTION COST:………………………………………					$	704,569
	Engineering and Administrative Costs (25%):……………………………………….					$	176,142.28
	TOTAL ESTIMATED PROJECT COST:………………………………………………					$	881,000

TOWN OF CATHLAMET
PRELIMINARY COST ESTIMATE
Project DE-5: Upper Elochoman Valley Road

NO.	ITEM	QUANTITY	UNIT		UNIT PRICE		AMOUNT
1	Mobilization/Demobilization (10%)	1	LS	$	78,000.00	$	78,000
2	Traffic Control	1	LS	$	12,000.00	$	12,000
3	Clearing and Grubbing	1	LS	$	6,000.00	$	6,000
4	Trench Excavation Safety System	1	LS	$	5,800.00	$	5,800
5	Locate Existing Utilities	1	LS	$	22,000.00	$	22,000
6	Erosion Control	1	LS	$	22,000.00	$	22,000
7	Bank Run Gravel	1850	CY	$	28.00	$	51,800
8	Foundation Material	600	TN	$	32.00	$	19,200
9	Crushed Surfacing	2500	TN	$	30.00	$	75,000
10	Sawcutting	250	LF	$	3.00	$	750
11	Connect to Existing System	2	EA	$	4,000.00	$	8,000
12	8-inch PVC Pipe (incl. Bedding)	7500	LF	$	55.00	$	412,500
13	8-Inch Resilient Seat Gate Valves	10	EA	$	1,800.00	$	18,000
14	Fire Hydrant Assembly	10	EA	$	5,500.00	$	55,000
15	Water Service Connections	30	EA	$	1,500.00	$	45,000
16	Additional Fittings	5000	LBS	$	3.50	$	17,500
17	Restoration	1	LS	$	6,000.00	$	6,000
	Subtotal:………………………………………………………………………….					$	854,550
	Sales Tax (7.6%):…………………………………………………………………….					$	64,946
	Subtotal:………………………………………………………………………….					$	919,496
	Contingency (20%):…………………………………………………………………..					$	183,899.16
	TOTAL ESTIMATED CONSTRUCTION COST:………………………………………					$	1,103,395
	Engineering and Administrative Costs (25%):……………………………………….					$	275,848.74
	TOTAL ESTIMATED PROJECT COST:………………………………………………					$	1,380,000

TOWN OF CATHLAMET
PRELIMINARY COST ESTIMATE
Project DE-6: Una Avenue Main Replacement

NO.	ITEM	QUANTITY	UNIT		UNIT PRICE		AMOUNT
1	Mobilization/Demobilization (10%)	1	LS	$	9,000.00	$	9,000
2	Traffic Control	1	LS	$	1,800.00	$	1,800
3	Clearing and Grubbing	1	LS	$	600.00	$	600
4	Trench Excavation Safety System	1	LS	$	600.00	$	600
5	Locate Existing Utilities	1	LS	$	2,500.00	$	2,500
6	Erosion Control	1	LS	$	2,500.00	$	2,500
7	Bank Run Gravel	70	CY	$	30.00	$	2,100
8	Foundation Material	20	TN	$	35.00	$	700
9	Crushed Surfacing	85	TN	$	30.00	$	2,550
10	Asphalt Concrete Pavement Class "B"	50	TN	$	150.00	$	7,500
11	Sawcutting	275	LF	$	3.00	$	825
12	Connect to Existing System	2	EA	$	4,000.00	$	8,000
13	8-inch PVC Pipe (incl. Bedding)	600	LF	$	65.00	$	39,000
14	8-Inch Resilient Seat Gate Valves	2	EA	$	1,800.00	$	3,600
15	Fire Hydrant Assembly	1	EA	$	5,500.00	$	5,500
16	Water Service Connections	5	EA	$	1,500.00	$	7,500
17	Additional Fittings	250	LBS	$	3.50	$	875
18	Restoration	1	LS	$	600.00	$	600
	Subtotal:……………………………………………………………………………….					$	95,750
	Sales Tax (7.6%):…………………………………………………………………….					$	7,277
	Subtotal:……………………………………………………………………………….					$	103,027
	Contingency (20%):…………………………………………………………………..					$	20,605.40
	TOTAL ESTIMATED CONSTRUCTION COST:………………………………………					$	123,632
	Engineering and Administrative Costs (25%):……………………………………….					$	30,908.10
	TOTAL ESTIMATED PROJECT COST:………………………………………………					$	155,000

TOWN OF CATHLAMET
PRELIMINARY COST ESTIMATE
Project S-1: New 530,000 Gallon Reservoir

NO.	ITEM	QUANTITY	UNIT	UNIT PRICE	AMOUNT
1.	Mobilization and Demobilization	1	LS	$236,370.03	$236,370.03
2.	Locate Existing Utilities	1	LS	$1,500.00	$1,500.00
3.	Project Temporary Traffic Control	1	LS	$2,000.00	$2,000.00
4.	Temporary Erosion and Sedimentation Control	1	LS	$2,500.00	$2,500.00
5.	Trench Excavation Safety Systems	1	LS	$2,500.00	$2,500.00
6.	Site Earthwork	1	LS	$10,000.00	$10,000.00
7.	Unsuitable Excavation	15	CY	$50.00	$750.00
8.	Crushed Surfacing Top Course	79	TN	$50.00	$3,954.72
9.	Crushed Surfacing Base Course	6	TN	$40.00	$255.56
10.	Topsoil and Hydroseed	80	SY	$3.00	$240.00
11.	Site Piping	1	LS	$20,000.00	$20,000.00
12.	Glass-Fused to Bolted-Steel Reservoir (incl. foundation)	1	LS	$2,300,000.00	$2,300,000.00
13.	Electrical. Telemetry, and Instrumentation	1	LS	$20,000.00	$20,000.00
	Subtotal:……………………………………………………………………………….				$ 2,600,070
	Sales Tax (7.6%):……………………………………………………………………….				$ 197,605.34
	Subtotal:……………………………………………………………………………….				$ 2,797,676
	Contingency (20%):……………………………………………………………………..				$ 559,535.13
	TOTAL ESTIMATED CONSTRUCTION COST:………………………………………				$ 3,357,211
	Engineering and Administrative Costs (25%):……………………………………….				$ 839,302.69
	TOTAL ESTIMATED PROJECT COST:………………………………………………				$ 4,200,000

APPENDIX R

DOH FINANCIAL VIABILITY

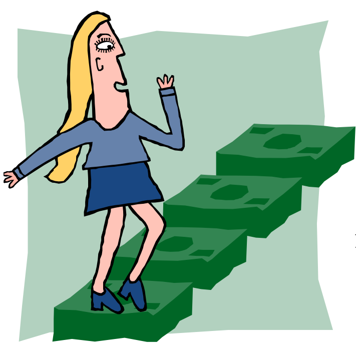
Aug. 2013
DOH 331-405
Revised

Financial viability for small water systems

Financial viability is the ability to obtain sufficient funds to develop, construct, operate, maintain, and manage a public water system in full compliance with local, state, and federal requirements on a continuous basis. In short, that means you should run your water system like a business.

Water systems should manage their finances to ensure they have enough funds for future needs as well as daily ones. However, many small water systems in Washington struggle with aging and failing infrastructure because their owners and operators did not run them like businesses. When you have enough money, you are better able to ensure safe and reliable drinking water now and in the future.

You can work toward financial viability one step at a time, using the following guidelines.



Five steps to financial viability

1. Develop an operating budget

Develop a six-year operating budget with enough income to pay for all regular maintenance and operations needs. Make sure to factor-in inflation by multiplying each year’s line-item costs by a 2 to 5 percent inflation factor. Remember, inflation is cumulative. You should add inflation to each year’s costs based on the previous year’s costs. To select the most realistic inflation factor for your area, check the Consumer Price Index that your county or nearest city uses. Your budget should also include debt payments and contributions to your reserves (see steps three, four, and five).

Reserve accounts are a vital part of your water system’s financial health. Because all water systems are different, there is no set formula for how much goes toward each reserve account. Your water system’s operator and board should decide together how much to contribute annually to each reserve based on the water system’s needs.

2. Take another look at your rates

Your rates may be keeping you from being financially healthy. Use your six-year operating budget to decide whether to raise your rates to cover projected costs. Many water systems are not charging enough to pay for basic maintenance and operations, contributions to reserve accounts, and debt payments.

Customers who use more water have a greater financial impact on the water system. Consider a rate structure that encourages customers to use water efficiently. Remember, you should always present rate change proposals to your customers in an open forum. For help developing your rates, see the resources on page four.

3. Create and fund an operating cash reserve

An operating cash reserve is extra money set aside to handle problems with cash flow. When you have enough funds set aside for your water system, you can continue paying your bills even if there is a lag in income. One approach is to fund an operating reserve equal to the amount of cash needed to pay for 30 to 45 days of water system costs.

You can fund your operating cash reserve with a one-time charge to customers, move funds from an existing reserve, or gradually set aside funds over a few years. Then be sure to add funds over time as needed.

4. Create and fund an emergency reserve

An emergency reserve account lets you respond to a true emergency such as vandalism, earthquake, storm damage, or flooding. It should have enough funds at all times to replace the most vulnerable part of the water system. You decide which part is most vulnerable as part of your water system planning. Vulnerable parts of your system include:

- A primary production well or other primary water source.
- Pumping equipment.
- Key transmission lines.

You should not use the emergency reserve to fund capital improvements or deferred maintenance problems. You can fund the emergency reserve the same way as the operating cash reserve, or by pre-qualifying for an emergency loan through a local bank or other lender.

5. Create and fund reserves for capital improvements and equipment replacement

You should have some savings to ensure that aging equipment and infrastructure do not become a financial burden for your water system. Use your capital improvement plan (done as part of your Water System Plan or Small Water System Management Program) to determine how much to save in your capital improvement and equipment replacement reserve.

In your capital improvement plan, you develop a list of equipment and infrastructure you will have to replace within the next six years. Make a "best guess" at how many years remain for each item and its replacement cost. You can use the Short-Lived Asset Component Inventory and Assessment table in the *Small Water System Management Program Guide* (331-134) to make these estimates.

You can use a "straight line depreciation" method to calculate a monthly amount to charge for replacing each item. Just add the totals together to determine monthly and annual contributions to this reserve fund.

1. Start with the item's improvement or replacement cost.
2. Divide by the years of useful life that remain.
3. Divide by 12 months.
4. Divide again by the number of water system connections.
5. Repeat for all the items on your replacement list.
6. Add the charges together.

You may also consider assessing fees, or applying for grants and loans as part of your financial plan to pay for capital improvements. Be aware that grant and loan funds are becoming more limited, and you will need to have a solid financial foundation to be competitive for these funds. In addition, if you decide to take out a loan, you might need to adjust your rates to repay the loan.

Benefits of financial viability

Predictable funding for capital improvements
Having available funding and a plan for capital improvements will keep your water system running smoothly and efficiently.

Improved system efficiency
Financially healthy water systems have well maintained and regularly replaced equipment that runs better, saving water, electricity, and wear and tear.

Cost savings
Deferred repair or replacement costs are often much higher when you let equipment age and fail.

Eligibility for grants and loans
Most grant and loan programs require water systems to demonstrate sound finances. If you spend time up front improving financial health, you are more likely to receive grants or loans.

Emergency response
Earthquakes, windstorms, electrical outages, flooding, and vandalism are examples of unforeseen emergencies. Water systems must have adequate cash reserves available to pay the costs associated with emergencies, such as providing bottled water to customers and returning to normal operations.

Peace of mind
When water systems have enough funds to pay for daily maintenance and operations, capital improvements, and unforeseen emergencies, their operators, board members, and customers do not have to worry or struggle to find means of payment.

Financial viability resources

Rural Community Assistance Corporation has free *Financial Viability Software* available online at http://www.rcac.org/home

The U.S. Environmental Protection Agency (EPA) offers the Check Up Program for Small Systems (CUPSS) (816-K-08-002). A free, easy-to-use, asset management tool for small drinking water and wastewater utilities, CUPSS is online at http://water.epa.gov/infrastructure/drinkingwater/pws/cupss/index.cfm

The following Office of Drinking Water publications are online at https://fortress.wa.gov/doh/eh/dw/publications/publications.cfm

Small Water System Management Program Guide (331-134)

Water Rates: Paying for drinking water (331-327)

Asset Management for Small Water Systems (331-445)

Setting Small Drinking Water System Rates for a Sustainable Future (EPA 816-R-05-006)

Department of Health Office of Drinking Water's Regional Offices

- Eastern Region: Spokane Valley 509-329-2100
- Northwest Region: Kent 253-395-6750
- Southwest Region: Tumwater 360-236-3030

Free technical assistance

- Evergreen Rural Water of Washington: 800-272-5981
- Public Works Board: 360-586-4120
- Rural Community Assistance Corporation: 509-860-5846

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