



## **INTRODUCTION**

The City of Cle Elum and the Town of South Cle Elum are located on the eastern slopes of the Cascade Mountains in Kittitas County, approximately 30 miles east of Snoqualmie Pass. Both Interstate 90 and the Yakima River essentially bisect the City and the Town.

For many years, the City of Cle Elum and the Town on South Cle Elum operated separate, independent water systems. However, since the initiation of major improvements in 2000, the two systems have operated as one, with ownership of various system components divided between the two communities. This joint operation, but individual ownership, is reflected in this Plan.

Both communities recognize the need to maintain, improve, and expand their water systems if they are to meet the demands of the system users. HLA Engineering and Land Surveying, Inc. was authorized by the City of Cle Elum and the Town of South Cle Elum to prepare this Water System Plan, which represents the culmination of planning and data collection efforts.

## **PLANNING REQUIREMENTS**

Water systems with 1,000 or more services are required to have a water system plan approved by the Washington State Department of Health (DOH) pursuant to the Washington Administrative Code, WAC 246-290-100 and WAC 246-291-140.

To assist water utilities in preparing their plans, DOH has published a *Water System Planning Guidebook*, Publication No. 331-068. This guidebook identifies information needed in a water system plan to “identify future needs and apply available resources most efficiently in order to provide high quality service at lowest cost while protecting the health of the community.” The guidebook is organized into ten major chapters, with each chapter representing a basic water system plan component. The ten chapters are:

1. Description of the Water System
2. Basic Planning Data
3. System Inventory and Analysis
4. Water Use Efficiency Program
5. Source Water Protection
6. Operation and Maintenance Program
7. Distribution Facilities Design and Construction Standards
8. Capital Improvement Program
9. Financial Program
10. Miscellaneous Documents

Each chapter is divided into several sections to address specific topics in detail. The City of Cle Elum and the Town of South Cle Elum *2022 Water System Plan* update has been prepared in the format of DOH *Water System Planning Handbook*.

## **OBJECTIVE**

The principal goal of water system planning is to make efficient use of available resources. This is accomplished by making decisions about water system capital improvements and operations which are in accordance with overall system policies and directions expressed in a utility's water system plan.

An equally important reason for developing a water system plan is to assure orderly growth of the system while maintaining reliable delivery of high-quality water. The plan is intended to guide water utility actions in a manner consistent with other activities taking place in the community.





The water system plan is intended to look ahead at least 20 years into the future. Development of a definite improvement schedule and financial program is required for the plan approval period, while the planning approach for the second period may be more conceptual. DOH plan approval is effective for ten years from the date of written approval, unless otherwise requested by DOH. To continually provide adequate guidance to decision makers, the plan must be updated prior to expiration of the current plan approval.

Once adopted by the City of Cle Elum and the Town of South Cle Elum and approved by DOH, the Water System Plan is considered by DOH “to be a commitment to implement the actions identified in the improvement schedule.” Future water system decisions shall be in accordance with the Water System Plan.

**PROJECTED WATER DEMANDS**

To plan for Cle Elum’s and South Cle Elum’s future water needs, the following items were examined:

Basic Planning Data (CHAPTER 2): Land use, future service area boundary, and population growth are used to evaluate demands on the joint water system. The City’s and Town’s 2020 population was estimated by the Office of Financial Management in Washington as 1,995 and 535, respectively. As extensive private development is anticipated to occur in the next 20 years, the total population within the joint water system service area for the 10-year (2032) and 20-year (2042) planning periods is estimated to be 11,254 and 13,187 respectively. The City’s average number of residential water services from 2013-2017 was 864 and the Town’s three-year average from 2017-2019 was 296. The future number of residential services connected to the joint system is estimated to be 1,788 by the year 2032.

Current Water Demands (CHAPTER 2): The greatest year of water consumption system-wide in the last six years was in 2017 when 321.809 million gallons was consumed. This is equal to an average daily consumption of 881,668 gallons. The maximum month of water consumption was experienced in July 2017, when the average daily consumption for the month was 70,925,196 gallons. Maximum day consumption (based on the maximum day of water production in the month) was 1,859,776 on July 31, 2017, and peak hour consumption was calculated to be 2,604 gpm.

Projected Water Demands (CHAPTER 2): The system’s water demand forecast for the year 2032, and the system’s current source capacity and water rights are below:

|                    | <b>PROJECTED YEAR</b> | <b>CURRENT SOURCE</b> | <b>CURRENT</b> |
|--------------------|-----------------------|-----------------------|----------------|
|                    | 2032 Demand           | Capacity              | Water Rights   |
| <b>ERUs</b>        | 7,295 / 7,750         | -----                 | -----          |
| <b>Annual</b>      | 709.363 MG            | 1,971 MG              | 1,603 MG       |
| <b>Maximum Day</b> | 4.491 MGD             | 5,400 MGD             | 12.414 MGD     |
| <b>Peak Hour</b>   | 5,240 gpm             | 4,500 gpm             | 8,321 gpm      |

**SUMMARY OF SYSTEM DEFICIENCIES AND RECOMMENDED IMPROVEMENTS**

The following is a listing of the major water system deficiencies and recommended improvements which have been identified in the existing water system. A more detailed description of these deficiencies and related improvements can be found in CHAPTER 3.

SUPPLY

**Source Capacity (System Finished Water)** – The regional water treatment plant currently has three filter trains, each with a capacity of 1,400 gpm, for a combined capacity of 4,200 gpm. To reliably meet 2042 projected maximum day demands, the fourth filter train will need to be constructed at the water





treatment plant. Consistent with 2001 Water Supply System Project Development Agreement between the City of Cle Elum and Trendwest (Suncadia), the developer(s) are required to construct system improvements as required to meet demands generated by the developments.

**Source Capacity (Zone 3 Finished Water)** – The Zone 3 reservoir is currently supplied by two finished water pumps, each with a capacity of 1,400 gpm, for a combined capacity of 2,800 gpm. To reliably meet 2032 projected demands, the third finished water pump will need to be constructed at the water treatment plant. Consistent with 2001 Water Supply System Project Development Agreement between the City of Cle Elum and Trendwest (Suncadia), the developer(s) are required to construct system improvements as required to meet demands generated by the developments.

**Source Pump Reliability** – All of the variable frequency drive units in the system, including three at the Yakima River Pump Station, two for the Zone 3 finished water pumps, and two for the Zone 2 finished water pumps, are nearing the end of their serviceable life and need replacement.

**Filter Train 1 & 2 Rehabilitation and Maintenance** – Filter Trains 1 and 2 were constructed in 2004 and need media replacement, as well as general inspection and repair of minor signs of aging.

**Cle Elum River Wellfield Reliability** – Raw water from the Cle Elum River is delivered to only one of the three treatment trains (Filter Train 1) for treatment. In the case of Filter Train 1 failure, raw water from this source is not available to the system. The programming at the water treatment plant should be upgraded to allow raw water from the Cle Elum River to be treated by any available filter train.

**Source Well Reliability** – Neither the Cle Elum River wellfield nor the South Cle Elum wells are equipped with in-place auxiliary engine generators with automatic power transfer switching capability to provide an alternate source of power during an outage.

**Water Rights** – A City's water right status is crucial in determining the amount of possible future growth. Cle Elum and South Cle Elum have a total annual water right authorization ( $Q_a$ ) of 4,918 ac-ft per year and instantaneous rights ( $Q_i$ ) of 8,621 gpm. As discussed in Section 3.4.2, current water rights are adequate in providing for existing and projected year 2042 demands reliant on existing City and Town water rights. Necessary water rights for the three proposed developments will be provided from Suncadia's existing water right portfolio. The City and Town currently require that any additional proposed new developments transfer any water right the developer may hold to the City prior to approval of the new development.

## STORAGE

**Storage Capacity** – Additional storage capacity will be needed for the total system, and specifically in Zone 3, by 2032 based on population and service projections.

**Zone 1.5 Reservoir Replacement** – The Zone 1.5 reservoir was constructed in 1938 and needs major rehabilitation or replacement.

**Reservoir Cleaning, Inspection, and Coating** – The other four system reservoirs (Zone 3, Zone 2, Zone 1 South Cle Elum and Zone 1 Cle Elum) need to be cleaned, inspected, and re-coated to maintain water quality, prevent corrosion and structure damage, and reduce the potential for leakage. It is recommended that steel reservoirs are recoated every 20 to 25 years. The frequency of cleaning and inspections is variable depending on several characteristics (water quality, mixing, water age and turnover, etc.) but it recommended the reservoirs be inspected and cleaning approximately every five (5) years.



## DISTRIBUTION

**Fire Flow Capacity** – Figure 3-5 identifies existing system fire flow capacities along with the minimum fire flow requirements for regions within the City. As shown on the figure, some locations are deficient based on the computer hydraulic model. Refer to Figure 8-1 for suggested improvements to address deficiencies.

**Water Main Upsizing and Replacement** – Some water mains in Cle Elum and South Cle Elum are in need of upsizing or looping to improve fire protection and to provide water service and fire protection for future growth. A significant portion of the system's water distribution mains are asbestos cement pipe that are showing signs of age and severe deterioration and need replacement. Suggested improvements for water main upsizing are shown in Figure 8-1.

## TELEMETRY

Cle Elum's telemetry control system was installed in 2004 and is controlled by a master Programmable Logic Controller (PLC), which is located at the water treatment plant. The Human Machine Interface (HMI) computer is the joint water system connection to the master PLC for making operational adjustments to the water system. The software was last updated in 2020 and will likely need to be replaced again within the next 10 years.

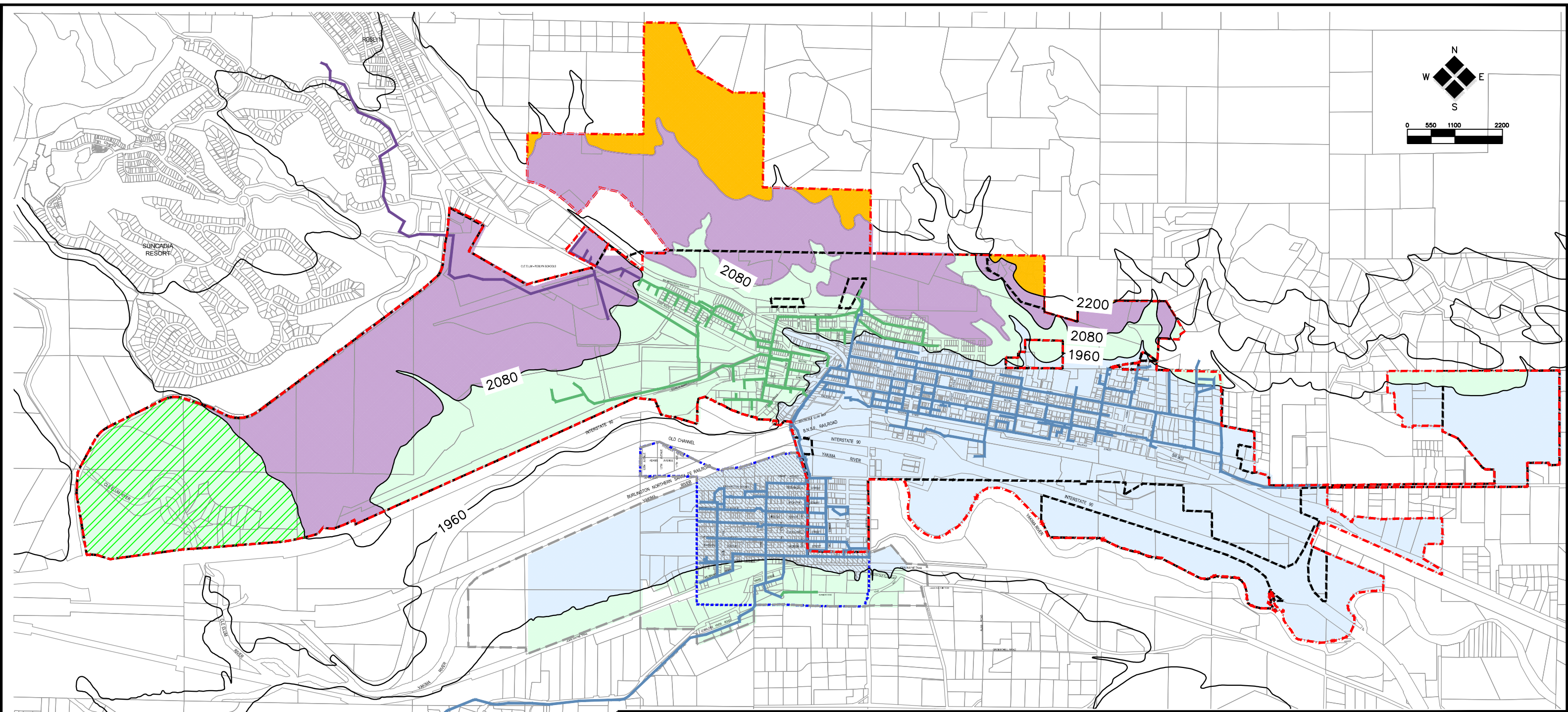
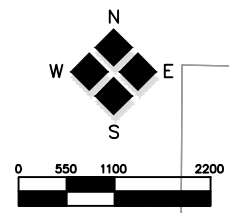
## PROPOSED WATER SYSTEM FINANCIAL PROGRAM

Recommended system improvements are scheduled for completion in annual increments for the next ten (10) years, as shown in CHAPTER 8. Scheduling of the remaining improvements beyond this ten-year planning period needs to be reviewed annually as priorities and City growth patterns change and progress. Major recommended improvements for future years (2032 through 2042) have been estimated but have not been scheduled at this time. Estimated improvement costs and total projected annual capital improvement costs are provided in CHAPTER 8.

To fund the recommended water system improvements discussed in this Plan, a proposed financial program has been developed and is provided in CHAPTER 9. The proposed financial program incorporates projected operations, improvements, and loan costs for the next ten-year period. Projected revenues and expenditures of the water system include growth factors and inflation rates, in addition to the recommended revenue and rate increases, to account for estimated growth within the City, as discussed in CHAPTER 9.

As discussed in CHAPTER 9, the City of Cle Elum manages three individual funds, one of which is funded by the City, the Town, and private developers to maintain and operate the regional water system. The projected revenues and expenditures specific to the regional fund have been included in the financial plan to account for major system improvements. The regional fund revenue was estimated to increase at the rates provided, but no further analysis of the regional fund rate structure or financial viability were conducted as part of this report.

The City of Cle Elum and the Town of South Cle Elum will continue annual reviews of the water system's financial program during their budget preparation process. The financial program will also be reviewed and revised as needed during the next update of the Water System Plan. This continued review will allow for modifications to the proposed rate and revenue increases, should financial conditions change.



**LEGEND**

|  |  |  |            |  |      |
|--|--|--|------------|--|------|
|  | CLE ELUM UGA BOUNDARY                          |  | WATERMAINS |  | AREA |
|  | CLE ELUM CITY LIMITS                           |  |            |  |      |
|  | SOUTH CLE ELUM UGA BOUNDARY                    |  |            |  |      |
|  | SOUTH CLE ELUM TOWN LIMITS                     |  |            |  |      |
|  | PRESSURE ZONE 2 AREA SERVED BY PRESSURE ZONE 3 |  |            |  |      |

| PRESSURE ZONE     | ELEVATION RANGE    | WATERMAINS | AREA |
|-------------------|--------------------|------------|------|
| ZONE 1            | (1,865' TO 1,965') |            |      |
| ZONE 2            | (1,965' TO 2,080') |            |      |
| ZONE 3            | (2,080' TO 2,200') |            |      |
| ALL ABOVE ZONES 3 | (2,200'+)          |            |      |

**CITY OF CLE ELUM/  
TOWN OF SOUTH  
CLE ELUM**  
Water System Plan Update  
**STATIC PRESSURE  
ZONE MAP**

