

2021 Annual Water Report



**VILLAGE OF CHASE
BRITISH COLUMBIA**

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INTRODUCTION

This annual report was prepared in compliance with the requirements under the British Columbia Drinking Water Protection Act (DWPA) and Village of Chase's Operating Permit issued by Interior Health Authority. Included in this report are consumption totals, water quality monitoring, & bacteriological sampling results. Village of Chase services approximately 1200 connections with an estimated population of 2600 residents within it's boundaries.

ANNUAL CONSUMPTION

Total consumption in 2021 was 309,886m³ for the surface water and 202,554m³ for the groundwater. The average daily water usage in Chase was 849m³/d for the surface water and 554.9m³/d for the well. The peak day was July 10th with 3843.6m³ for the surface water and 4345.4m³ on June 29th for the ground well. The South Thompson River obtained 60% of the source water and the Chase Creek Aquifer obtained 40%.

SYSTEM OVERVIEW:

TREATMENT PLANT

The South Thompson River Raw Water pumping system is capable of conveying 5.7 ML/d through the GE Membrane Filtration skid located at the Water Treatment plant on Mill Rd. The Membrane Filtration skid is rated to produce a net of 5.4 ML/d of treated water, with a maximum of 5% waste flows for membrane back pulsing, strainer cleaning, and chemical cleaning. The Membrane skid is controlled based on the transmembrane pressure across the membranes, the permeate water quality and specific flux. Permeate from the Membrane Filtration skid passes through a UV reactor and discharges into the Chlorine Contact and Treated Water Storage Tank. The UV reactor control is based on the process flow and the measured UV and intensity.

DISTRIBUTION SYSTEM

The Village of Chase water utility serves a population of approximately 2,600, and there are approximately 1,200 service connections. An assessment management plan of current water infrastructure was conducted by an outside contractor to assess the condition of our water pipes and appurtenances along with other infrastructure components in 2021. Based on 2010 the maximum day demand was approximately 75 L/sec with projected future (2033) maximum day demand estimated at 115.7 L/sec. Major components of the water system from source to tap includes the following:

- One (1) surface source – South Thompson River intake;
- One (1) groundwater well (production well) and one backup well (test well);
- Water treatment plant;
- Raw water transmission main from intake pumps station to the water treatment plant;
- 2 storage reservoirs totaling approximately 2,100 m³ of storage; and
- 25 kilometers of distribution piping ranging in diameter from 100 mm to 400 mm.

WATER STORAGE

The distribution system is segregated into one pressure zone (Gravity feed) with 2 storage reservoirs totaling approximately 2,100 m³ of storage.

WATER QUALITY MONITORING

The quality of our water is analyzed regularly at the source and after treatment through Online instrumentation on the SCADA system, and within our distribution system based on the attached water quality schedule. Figure 3 summarizes this analysis. The following paragraphs describe the parameters that are analyzed.

pH

The pH of water is a measurement of how acidic or basic it is. The pH scale runs from 0 (most acidic) to 14 (most basic) and 7 being neutral. Natural waters usually have a pH of between 6.5 and 8.5.

TURBIDITY

Turbidity is the cloudy appearance of water caused by the presence of suspended and colloidal matter. A turbidity measurement is used to indicate the clarity of water. The measurement unit is called a Nephelometric Turbidity Unit (NTU). The turbidimeter measures the intensity of light scattered at 90 degrees as a beam of light passes through a water sample. The Guidelines Canadian Drinking Water Quality (GCDWQ), state that drinking water should have a turbidity of less than 1 NTU. Our treatment plant should not have a turbidity of greater than 0.3 NTU.

CHLORINE RESIDUAL

Chlorine levels are important in water treatment to ensure that water is safe all the way through the distribution system to each home. Sodium hypochlorite is the form of chlorine used in our treatment system. Free chlorine measures the amount of hypochlorite in our water, while total chlorine measures the free chlorine plus any combined chlorine disinfectants such as chloramines. Residuals are monitored throughout the water system regularly and must not fall below 0.2 PPM in accordance with the Canadian drinking water quality guidelines (GCDWQ)

UV TRANSMITTANCE (UVT)

UVT is related to the quantity of organics, colloidal solids and other material in the water which absorb and scatter the UV light as it passes through the water. In a UV disinfection system, if the UVT of the water is too low, then the UV light is not able to penetrate the water as efficiently, thereby reducing the effective UV dose delivered.

Figure 3: Water Quality Monitoring

TREATED WATER	FREQUENCY	SCADA	OUTSIDE LAB
Temperature	Daily	X	
pH	Daily	X	
NTU	Daily	X	
UVT	Daily	X	
Free Chlorine	Daily	X	

SOURCE WATER	FREQUENCY	SCADA	OUTSIDE LAB
PH	Daily	X	
Temp	Daily	X	
NTU	Daily	X	
Full Chemical Analysis	Freshet		X

DISTRIBUTION	FREQUENCY	IN HOUSE	OUTSIDE LAB
Bacteriological	Weekly		X
Chlorine Residual	Weekly	X	
NTU	Weekly	X	
THM's	Seasonal		X
HAA's	Seasonal		X
TOC	Seasonal		X

DISTRIBUTION SAMPLING LOCATIONS:

1250 Shuswap Sands
730 Foothills Road
129 Shuswap Ave
530 Alymer Road
1301 Cummings Street
826 Okanagan Avenue

DISTRIBUTION SAMPLES

BACTERIOLOGICAL ANALYSIS AND CHLORINE RESIDUALS

The Drinking Water Protection Regulation (DWPR) requires that water suppliers monitor for total coliform bacteria and *Escherichia coli* at frequencies set out in Schedule B of the regulation and submit to an accredited laboratory for analysis. The frequency of water samples is four per month for the population of Chase (Under 5,000), They are taken from two sites, alternating periodically. These water samples are then submitted to ALS Environmental Laboratories in Kamloops for bacteriological analysis. Village of Chase personnel also sample for residual chlorine and turbidity at 6 different locations in the distribution system throughout the year. All samples came back well within the Canadian drinking water quality requirements (GCDWQ).

2021 PROJECTS AND IMPROVEMENTS

Early spring and fall the Village of Chase continues to conduct the uni-directional flushing program for the whole distribution system. Also, THM analysis has continued from the direction from the Specialist Environmental Health Officer to meet the guidelines for Canadian Drinking Water Quality.

CROSS CONNECTION CONTROL

Village of Chase has a cross connection policy in place and was working on updating the database in 2021. Cross connection control devices for Village owned properties and buildings are tested annually by Village personnel.

Water Regulations Bylaw No. 718-2010, section 20.

EMERGENCY RESPONSE PLAN

The Village of Chase has an Emergency Response Plan pertaining to the water system. The emergency response plan identifies a number of potential emergencies that can occur and provides a systematic approach on how the Village will deal with the emergency. See in attachment to this report.

STAFF CERTIFICATION

In cooperation with Interior Health Authority's *Condition on Permit* and the Environmental Operators Certification Program (E.O.C.P), The Village of Chase is working on meeting the facility classification level III. The current operator on site and contracted operator holds a Level II Water treatment certificate and is actively working towards Level III certification.

Richard Bastiaansen - Water Treatment Level II
(Cloudburst Waterworks)

John Fandrey - Water Treatment Level II

John Fandrey - Water Distribution Operator Level II

John Fandrey - Cross connection control certified
tester