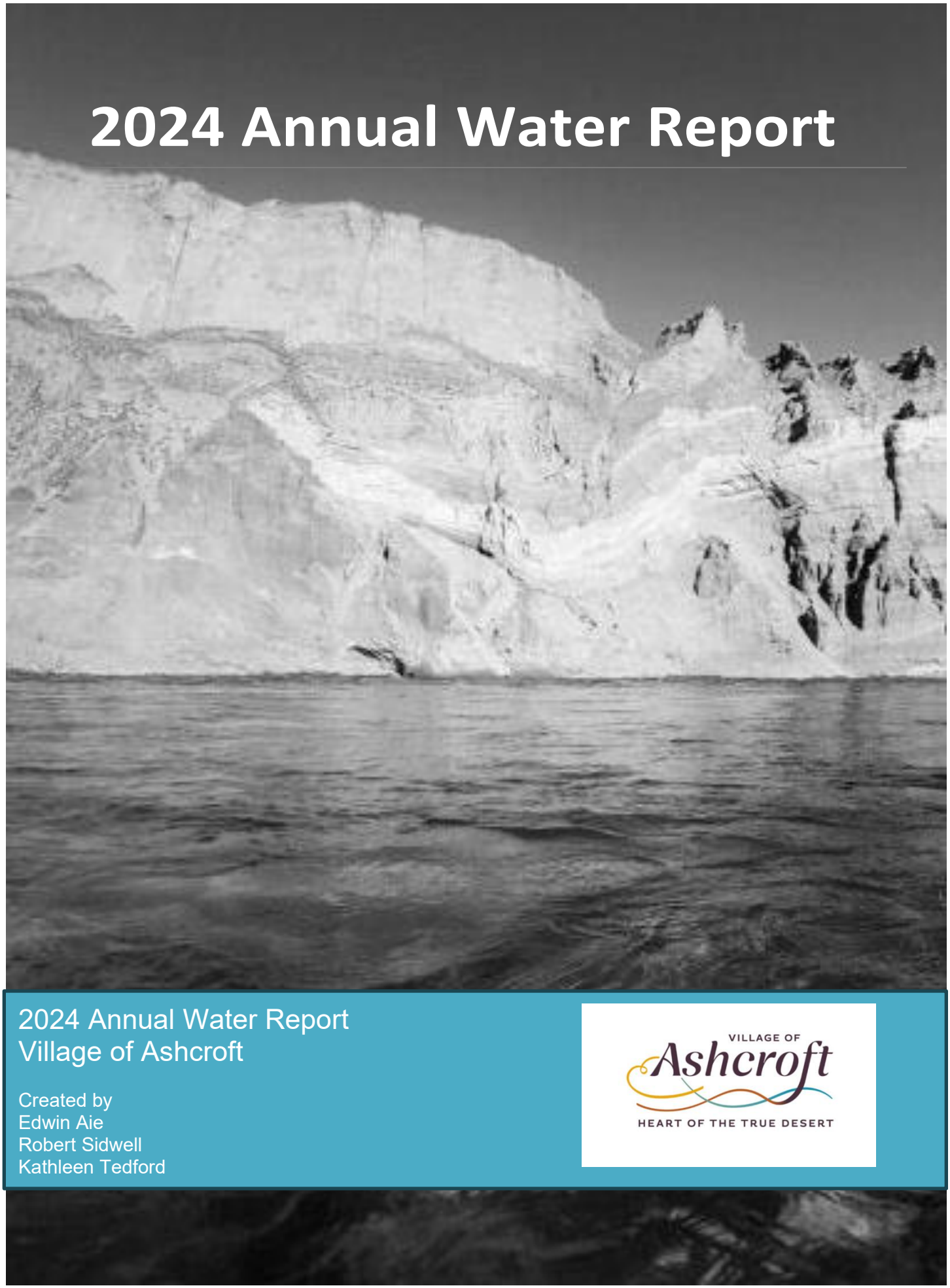
# 2024 Annual Water Report



## 2024 Annual Water Report
## Village of Ashcroft

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VILLAGE OF Ashcroft
HEART OF THE TRUE DESERT

# INDEX

# OVERVIEW

## INTRODUCTION

The Village of Ashcroft provides an annual report to the users of its water treatment and potable water distribution system. Included is an overall summary of this year's production quality, the volume of water provided, and any major Maintenance or improvements made to the system.

Ashcroft's distribution permit requires this report to be made accessible to the public, and the report be summited to the governing Health Authority (Interior Health.)

## SUMMARY

The Ashcroft Water Distribution System consists of one surface water source, the Thompson River (which is influenced by the Bonaparte River and Deadman's Creek.) Being a river and open to atmosphere, this raw water source is at risk of contamination. We treat for harmful pathogens, high organic and inorganic loads, and seasonal fluctuations in quality. We draw from the riverbed using two intake pumps.

This water is then treated by being passed through parallel flights of ultra filtration membranes, located in our water treatment building constructed in 2018. These filter membranes insure a 99.9% removal of turbidity and suspended contaminants from the drinking water prior to the disinfectant process.

After filtration we collect the water in our River Pumphouse Wet Well, where it is temporarily stored until a demand is received from the reservoirs. Two vertical highlift pumps are available to push the water uphill towards the #1 reservoir, at which point a dose of sodium hydrochloride is added into the pipeline and provides the disinfectant needed to protect our customers and distribution network. An appropriate dosage of liquid Chlorine with the necessary contact time performs a 99.99% removal of any harmful biology.

From the main reservoir, the water is mechanically moved to adjoining reservoirs, and gravity fed to consumers. The reservoirs serve two main functions, one is to provide flexibility and storage for varying user demand, and to ensure an adequate volume of water in reserve should there be a need to provide water for fire protection.

The water distribution and Treatment System must compete with seasonal variation of customer demand and seasonal variations in raw water characteristics. River water levels both high and low pose a risk to our intake system. Freshet and seasonal rain events greatly increase the number of contaminants in the Thompson and upriver mouth of the Bonaparte rivers. It should also be noted that the local ecology was greatly affected during the 2017 elephant hill fire, and we continue to observe deteriorated water quality. Our distribution system is used to supply the different pressure zones within our municipality. It includes Pump Houses and Booster stations which work to regulate water levels and reserves.

## Intake Pumps

Through discussions with the Department of Fisheries and Oceans the Village obtained permits to install two submersible pumps in the channel of the river.

As of March 2021, a subterranean chamber has been installed, allowing for extractions and maintenance of the river pumps to occur regardless of river levels.

The Village, after suffering from intake pump failures during the 2023-2024 season, now maintains a third Intake Pump in our inventory and an Emergency submersible pump setup with a cage to be used in the event of an intake system failure.

## River Pump House

The Ashcroft River Pumphouse is located at the edge of the downtown area along the Thompson River. It is located beside the Legacy Park campground. The building was constructed in 1992. Originally the plant used infiltration galleries imbedded in the Thompson River, however, after 6 years the filter cloth became inefficient due to a buildup of silt. The River Pump house chlorine room treats all water with chlorine as it enters the distribution system. The River Pump House has two highlift pumps, each one capable of supplying up to 110 l/s. These pumps are used to move the treated water up into our main reservoir.

## Water Treatment Plant

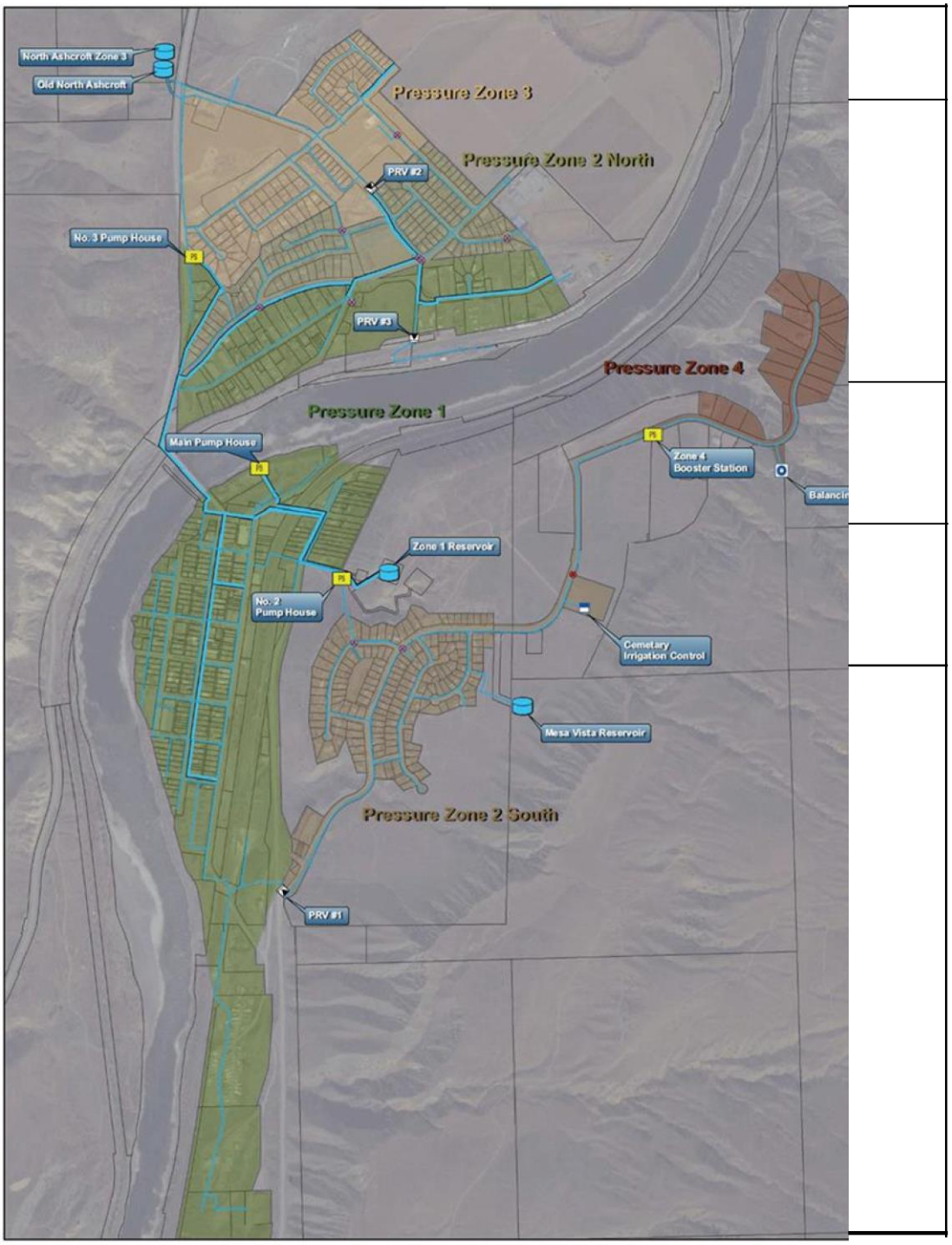
The plant was commissioned August 2019. The plant purifies the raw water by pumping the raw water through 2 PALL ultra-filtration SKIDS arranged in parallel. This is a mechanical treatment process which uses pressure differential across a series of micron filter straw filaments to capture suspended matter and ensure a 99% log removal of turbidity.

A chemical storage/dosing room can be found in the plant. The standard chemicals we use are 12% Hypochlorite, Citric acid, Sodium hydroxide and a Chlorine neutralizing agent called Captor.
Diaphragm pumps are used to accurately dose all processes and treatments, feeding into our mixing tanks on the basement floor.

The lower level of the plant contains our HVAC room, Neutralization Tank, Residuals Tank and CHN SKID. The Neutralization tank holds and chemically contaminated wastewater from the treatment process, where it is neutralized and rendered safe to be released into the sewer collection system. The residuals tank is used to hold and settle any wastewater produced in the treatment process so long as it is chemical free, feeding any clarified supernatant water into the front water feature and river outlet.

Two cyclone sand separators were installed in line with our raw water inflow, in 2021. The separators strip the sand and heavy suspended matter from the water before it is fed to the more friction sensitive components of the plant.

There is a 674 Kw generator housed in the Water Treatment Plant (WTP), used in the event of a power outage. It is designed to be large enough to operate both the water treatment plant and distribution highlift pumps.




Water Master Plan
Vliiage of Ashcroft
Water System

FIGURE 1.1

## Reservoirs

The Zone 1 reservoir is located in the bench of the Mesa Vista Subdivision. It has a capacity of 1.505 million litres and is at an elevation of 368 meters. All water used in the Ashcroft distribution system passes through this reservoir. This is a concrete in ground structure that is divided into two separate chambers which allows the Village to empty a section at a time for maintenance and repair purposes.

The Mesa Vista reservoir is located in the bank above Vista Heights Drive. It has a capacity of 1.36 million litres and is at an elevation of 422 meters. This reservoir provides water to the Mesa Vista subdivision as well as to the area known as the Rural Subdivision. This is a concrete in-ground structure, however due to some cracking in the 1990's a rubber membrane was installed.

The North Ashcroft reservoir is located off Highway 97C across from Government Street. It has a capacity of 1.06 million litres with an elevation of 401 meters. It is a concrete in ground structure. Adjacent to this reservoir is an above ground tank with a capacity of 311,000 liters and an elevation of 399 meters. This tank is for emergency use only at this time.

## Pump Houses

The main pumping station or River Pump House is at the water source along the banks of the Thompson River. The pump house was constructed in 1992 and houses two 200 hp pumps. These pumps supply all the water used in the system.

#2 Pump House is located off Highway 97C below the Mesa Vista subdivision. This pump house ensures that the Mesa Vista reservoir levels are maintained. This Station contains three 30 Hp pumps. As of 2022, a backup generator has been added to the station.

#3 Pump House is located off Highway 97C just below Government Street. This pump house ensures that the north Ashcroft reservoir levels are maintained. This station contains two 50ph pumps and one 25ph pump.

A booster pump station is located on Mesa Vista Drive in the rural subdivision. This booster pump station ensures that the small reservoir that services the rural area is filled. In 2014 this pump station was upgraded to allow additional chlorination in the winter months due to the low use flows.

## Pressure Zones

The Village is divided into 4 pressure zones. The system pressure in each zone ranges from 65 psi to 105 psi. As part of its Water Regulations Bylaw the Village requires all service connections to the Village's water system to have a pressure reducing valve where the service line enters the premises, as well as back flow protection.

## Water Distribution System

The Village of Ashcroft has 844 residential and 147 commercial water connections serving the citizens of Ashcroft. These users get their drinking water from the Thompson River.

As part of the water distribution system the Village maintains 21 kms of water lines, 5 in ground reservoirs, 1 above ground steel tank, 3 pump stations and 1 booster pump station.

The Village's distribution system is 21.4 km long and is made up of 6,429 m of ductile iron pipe, 11,488 m of asbestos cement pipe and 3,471 m of PVC pipe. Pipe sizes range from 100mm to 400 mm in diameter.

The age of the water mains ranges from new to approximately 50+ years old. The age of the pipe does not necessarily reflect the need to replace it as the various material types have different life expectancies. For example, cast iron pipe can last up to 100 years whereas galvanized pipe is only expected to last up to 40 years.

The Village does not currently have a pipe replacement policy.

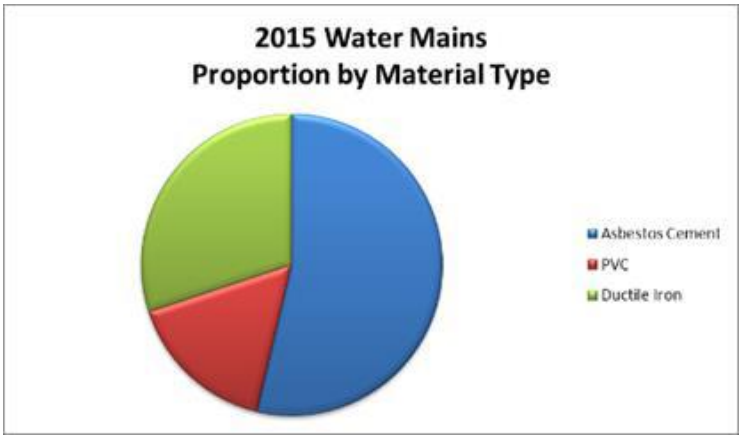



Figure 1

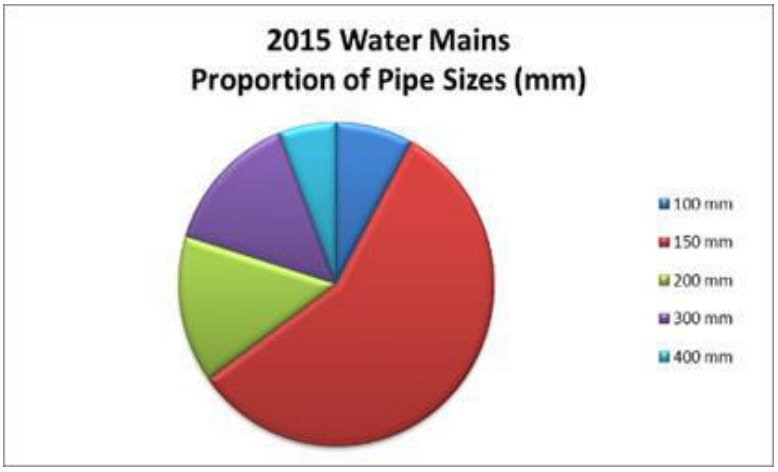



Figure 2


Routine
Maintenance

## Distribution

Fire hydrants are inspected and flushed annually. The water mains are flushed to remove any buildup of silt in the lines and to identify areas where blockages may be forming. Since the commissioning of the water treatment plant in 2019, the quality of water being distributed has reduced our need for water main flushing.
The Village has 1 employee that holds the Water Distribution Level 1 certification and 1 employees with their Water Distribution Level 2 certification. Ongoing education for certification is encouraged.

## Intake

The Village carries out a regular preventative maintenance program at the water intake. The program includes a daily site visit that includes ensuring the pumps are operating properly, an inspection of the chlorination system and turbidity monitoring. Abnormalities in any of these systems are investigated and repaired as soon as possible. At the end of March, the diving company Aqua-Bility, performs their annual inspection and cleaning of the pumps, river intake screens and security. These inspections are recorded and retained for future reference.

## Reservoirs

The Village reservoirs are inspected regularly to ensure that the site and structures are secure. The reservoir levels are adjusted seasonally to ensure that the turnover of water is rapid enough to ensure the chlorine levels and fire protection needs are maintained.

## Water Treatment Plant

Ashcroft's water treatment plant is classified as a level 2 ultra-filtration membrane plant. The purification system is designed by PALL and is maintained using their standardized cleaning and upkeep processes, such as EFMs and CIPs.

The Village monitors the water treatment plant every day of the year. We inspect the site for any vandalism, damage, or failures. Daily bench tests are performed on both our raw and filtered samples to determine turbidity, dissolved organics, hardness, pH and temperature.

Integrity tests are performed and recorded daily. These results identify if there are any breaches in our filter system that could be a cause for health concerns. These readings are submitted to IHA along with outlet turbidity in order to ensure consistent quality control. The village is equipped with an automated alarm system to notify an operator in the event that any failures occur.

The Village has 1 employee that holds the Water Treatment Level 1 certification and 2 employees with their Water Treatment Level 2 certification.

## Pump Houses

All of the Village's 3 pump houses are inspected daily. All pumps and motors are inspected regularly and serviced annually

## 2024 Maintenance:

Jan 12, 2024 _ Upstream intake pump appeared to be frozen, exceptionally low temperature of -30 degrees Celsius and low water levels were a contributing factor. To resolve the issue, we locked out and drained the intake chamber, before putting the intake pump back into operations. To prevent a similar issue in the future, we revised our seasonal winter programing.

Feb 16, 2024 _ A new chlorine storage tank was installed in the WTP chemical storage room. Past issues that arose the old tank were rectified.

March 21 _ 2024 Inspection and cleaning of intake pump screens by Aqua-Bility Projects

April 10, 2024 _ We put in a new style of transfer pump (peristaltic) for the chlorine system. The previous pump was ill-matched to our needs and would often fail.

July-August _ Aqua-Bility came in with a team of divers to clean and inspect all water reservoirs with the exception of PH3's pump chamber and the Rural Sub reservoir.

Oct 30, 2024 – Out captor dosing system started to syphon itself down into our CHN SKID. This was rectified by disassembling and cleaning check valves. We have now instituted daily visual monitoring of the consumption to quickly catch and prevent further issues.

## 2024 Capital & Operating Plans:

1. Land purchase for reservoir & ALC removal
2. Intake pump cage review and improvements
3. Reservoir cleaning/repair/flushing
4. Double Block and Bleed installations
5. WTP solar energy tracking

There has been a total of $180,000 allocated to these improvements scheduled and budgeted at the beginning of the year.

| 2024 Capital & Expense Breakdown | |
|---|---|
| Common Services | 204,493 |
| Hydrant Maintenance | 301 |
| Water Distribution | 205,049 |
| Water Purification | 27,594 |
| Water Treatment Plant | 81,297 |
| Wells & Reservoirs | 149,771 |
| Amortization & Fiscal Services | 283,866 |

The total costs of operating and capital for **2024 were $952,000**. This included Common Services such as overhead, training, insurance and licensing. Fiscal services such as annual amortization/depreciation are also included in the total.

## Water Consumption

In 2024 the Village treated 950,740 cubic meters of water July was our highest demand month and February was our lowest demand month. Our highest demand in a 24 hour period was on July 19th when we pumped 5,486.4 m3. Our lowest demand in a 24 hour period was on December 27th when we pumped 1,269.5 m3.

Our water is treated with liquid 12% sodium hypochlorite and in 2024 we used a total of 14,760L.

Figure 3 indicates that in 2024 the monthly consumption followed our expected trend in usage, however, there was an overall use decrease from the last 2 years. In 2024 the decrease is likely due to Council implementing a Stage 2 water restriction May 1st rather than the usual Stage 1.

Figure 4 shows that the volume of water treated saw a continuous increase from 2021 to 2022 and then decreased in 2023. In 2021 the Village treated 961,234 m3. and in 2022 the volume increased to 1,059,591 m3, 2023 was slightly lower than 2022 at 1,018,528 m3, and this year we fell to 950,740.8 m3, the lowest we have seen in the past 4 years.

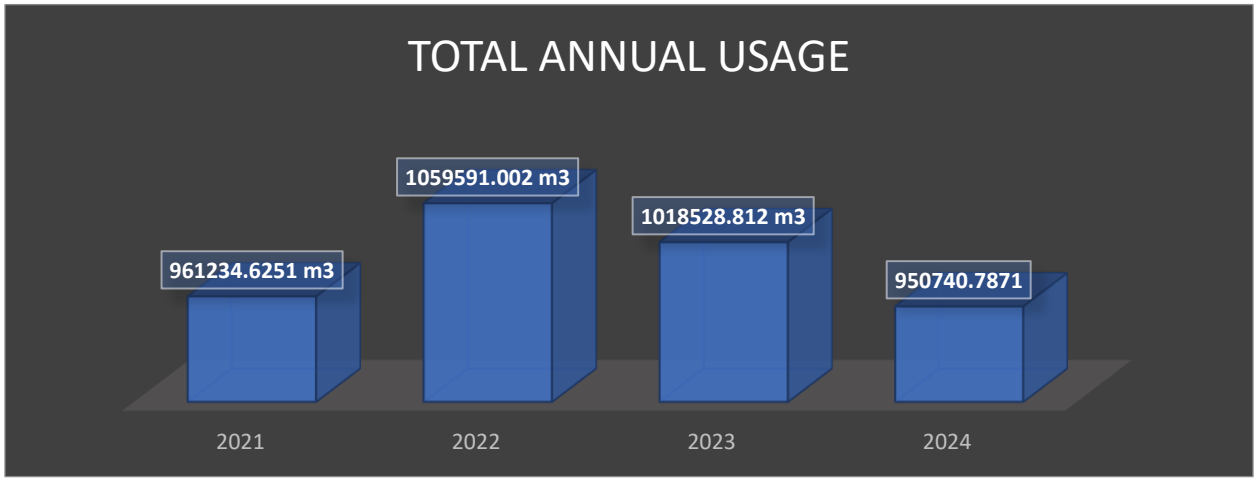



Figure 3

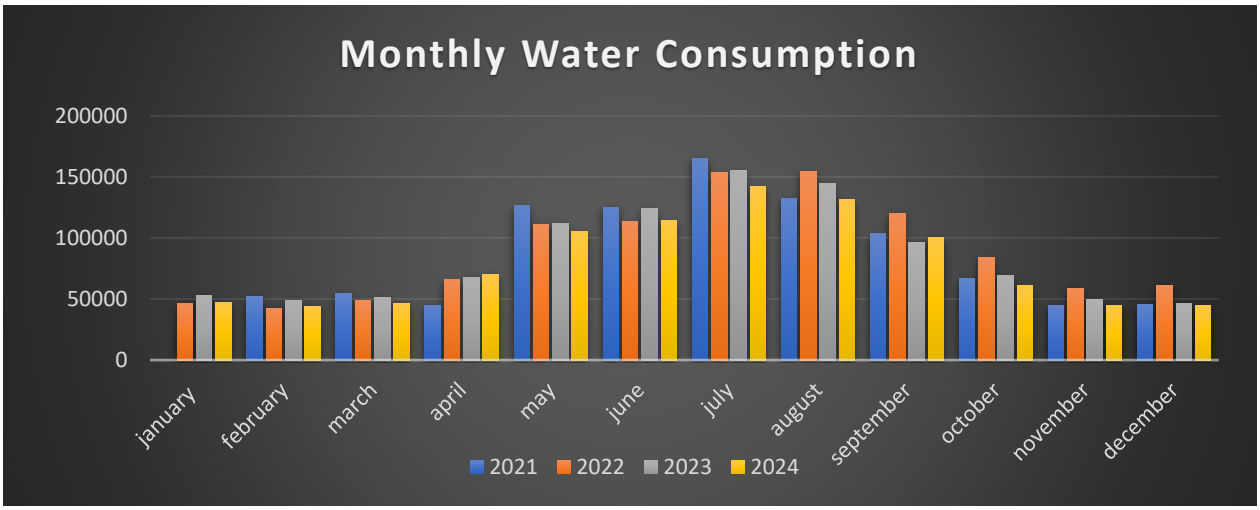



Figure 4

## Water Conservation

In 2015 the Village passed a water conservation bylaw that introduces watering restrictions annually on May 1st. Residences will be restricted to watering on even/odd days depending upon their house number. In addition, the times that residences may water has been reduced and varies depending upon the type of irrigation system in ground automated systems vs. hose and sprinklers. The bylaw permits further reductions in watering if there are drought conditions or power outages.

During seasonal periods of low raw water quality and limited water treatment plant production, temporary water restrictions will be published and enforced through bylaws that limit the public demand and ensure we can prioritize necessary services, such as fire prevention.

Due to ongoing drought conditions and provincial concerns for water supply, Council opted to increase Ashcroft's water conservation efforts in 2024 by implementing a Stage 2 water restriction effective May 1st. (below)

# Water Restrictions

**Beginning May 1, 2024 STAGE 2 Water Restrictions are in effect.**

**Due to the reduced snow pack and anticipated low water supply, under the provisions of the Village of Ashcroft Water Conservation Bylaw No. 799, Council is taking a proactive approach and implementing Stage 2 water restrictions beginning May 1st rather than the usual Stage 1. Below is an excerpt from Bylaw No. 799 with the restriction details:**

**STAGE 2 WATER CONSERVATION MEASURES**

**1)** During Stage 2 Water Conservation Measures, no person shall use a watering system to water a lawn, garden or landscaped area on a property except:

- At premises with even numbered civic address, on Wednesdays and Saturdays between 6:00 am and 9:00 am as well as 8:00 pm and 11:00 pm for hose supplied sprinklers or between 12:00 am and 6:00 am for underground automated sprinkler systems.
- At premises with odd numbered civic addresses, on Thursdays and Sundays between 6:00 am and 9:00 am as well as 8:00 pm and 11:00 pm for hose supplied sprinklers or between 12:00 am and 6:00 am for underground automated sprinkler systems.

**2)** During Stage 2 Water Conservation Measures, the following uses are permitted:

- Hand watering of flower gardens, vegetable gardens, decorative planters, shrubs or trees. Drip irrigation or micro sprinkler irrigation for watering flower gardens, vegetable gardens, decorative planters and shrubs or trees is also permitted. Hand watering of lawns or grass is not permitted.
- Watering of public sports fields, school yards, public parks and cemeteries.
- Filling and maintaining of private pools, spas, hot tubs and ponds.
- Prevention or to control fires.
- For health and safety of any person.

The Corporation of the Village of Ashcroft


Water
Sampling
and
Testing

## Bacteriological

As required by the Drinking Water Protection Act and Regulation, Village staff send weekly samples of the water to an independent laboratory for bacteriological testing for Total Coliforms and E-coli Bacteria. There are three different sampling sites used throughout Ashcroft. In addition, water samples are taken from within project areas after any work on the infrastructure. In addition, the Village does regular in-house testing of our dead-end services to ensure that the treatment is adequate and residual cl2 levels are maintained.

## Turbidity

As the Village uses surface water for our source, turbidity is a concern.

Prior to 2019 then the water treatment plant was commissioned and put into production, the Village of Ashcroft often needed to post water quality and boil water notices during seasonal periods of high turbidity. Today, the water being distributed to the public is unaffected by high turbidity, as the new PALL filtration system was specifically chosen because of its efficacy in removing suspended solids and provides a constant outflow quality of NTU (turbidity) under 0.1.

The Thompson River has continued to experience peaks of turbidity during times of spring melt/freshet, as well as during heavy rain weather events. These waves of poor raw water turbidity are also influenced by the seasonal cycles of the upstream Bonaparte River. Over the 2024 season the highest recorded raw water value was 20.7 NTU in June. This season has had a higher raw water quality compared to the 3 previous years.

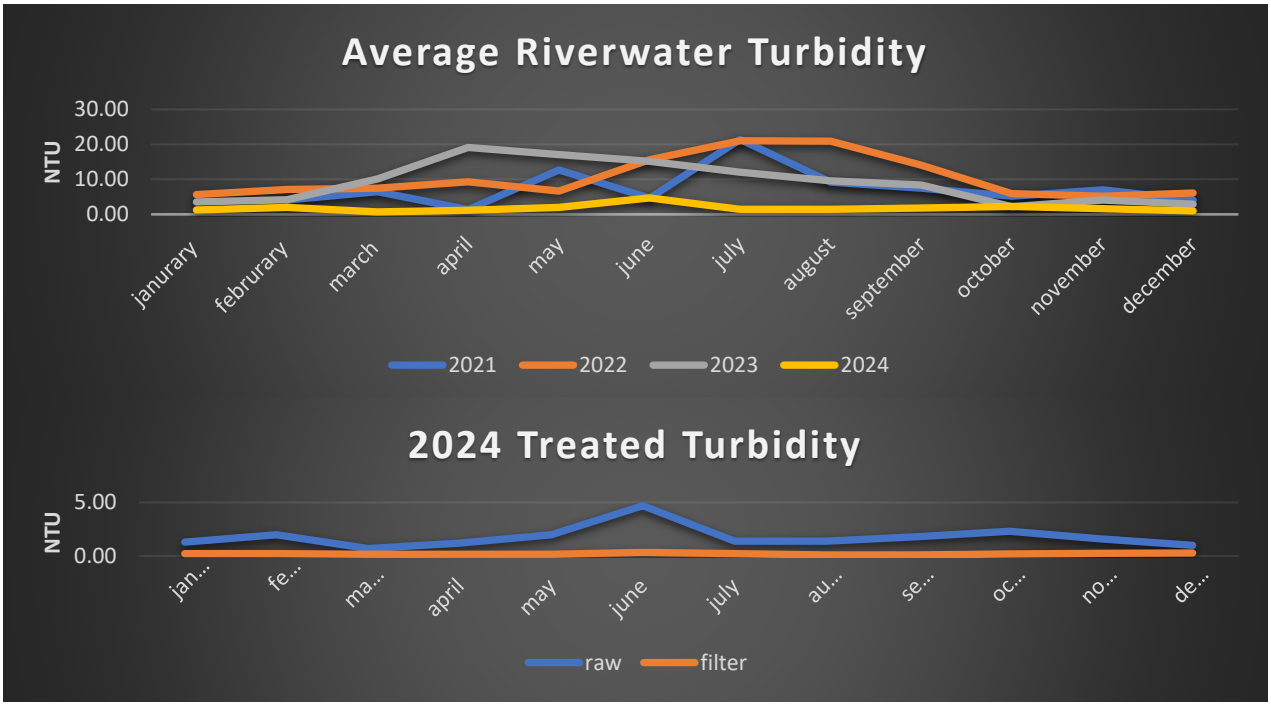



Figure 5




Figure 6

## Full Spectrum Analysis

The Village has a full spectrum raw water analysis done twice every year, during the months of January and June. This test is considerably more complex and tests for alkalinity, and metals.

## Cross Connection Program

The Village has a cross connection Bylaw. Those properties that have been assessed and have back flow protection devices, are required to have them inspected and tested yearly. These reports are to be forwarded to the village of Ashcroft, to be filed on record. All new buildings and structures need to conform to the Village Bylaw and building code.

## Emergency Response Plan

The Village has an emergency response plan that was prepared in 2004, 2013 and completely redone in 2019. The plan is reviewed annually thereafter in accordance with the Drinking Water Protection Act and Regulation.

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