



Whitevale Water Utility 2023 / 2024 Annual Report



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ACRONYMS

BWN	Boil Water Notice
Caro	Caro Analytical Services
CCCP	Cross Connection Control Program
CFU	Colony Forming Units
COP	Conditions on Permit
CT	Contact Time
DBP	Disinfection By-Product
DWO	Drinking Water Officer
DWPA	<i>Drinking Water Protection Act</i>
DWPR	Drinking Water Protection Regulation
DWTO	Drinking Water Treatment Objectives (Microbiological) for Ground Water Supplies
E. coli	Escherichia coli
EOCP	Environmental Operator Certification Program
ERP	Emergency Response Plan
FUS	Fire Underwriters Survey
GARP	Ground Water at Risk of Containing Pathogens
GCDWQ	Guidelines for Canadian Drinking Water Quality
GWUDI	Ground Water Under Direct Influence of Surface Water
HAA	Haloacetic Acids
IH	Interior Health
NTU	Nephelometric Turbidity Units
OP	Operating Permit
PLC	Programmable Logic Controller
RDNO	Regional District of North Okanagan
SCADA	Supervisory Control and Data Acquisition
SS	Sample Site
Teale's	Teale's Water Utility Service
THM	Trihalomethanes
WQA	Water Quality Advisory
WVW	Whitevale Water Utility

INTRODUCTION

As required by the *Drinking Water Protection Act* (DWPA) of BC, the Regional District of North Okanagan (RDNO) provides the following annual report in accordance with the Operating Permit (OP) for the Whitevale Water Utility (WVW).

This report provides an overview of the following:

- The water system of WVW
- The operations of the water system, including management, Environmental Operator Certification Program (EOCP) classification, and operations programs
- Source assessment and watershed protection, the annual water quality monitoring program and a summary of the 2023 and 2024 water quality analysis
- Water consumption
- Emergency response
- Reporting requirements
- Annual completed works
- Long-term plans.

The annual reports are available to the public on the RDNO website www.rdno.ca/www.

WATER SYSTEM OVERVIEW

1. SYSTEM OVERVIEW

The WVW system was constructed in the mid-1970s and was operated as a private utility until 1992 when it became a function of the RDNO. Appendix A provides the water service boundary and properties serviced by WVW.

The WVW system consists of a single well source, Well 2 (well plate identification number (WPID) 16643 and well tag number (WTN) 90803), that pumps into a below ground reservoir. The reservoir provides storage for demand variations, fire demand (not to Fire Underwriting Survey (FUS) standards), and contact time for disinfection. Two (2) separate pumps meet the distribution system demand under various flow conditions, and a third pump will provide additional flow for fire demand, but this flow does not meet FUS standards. Two (2) redundant pumps dose 12% sodium hypochlorite into the reservoir inlet during well runs. Online free chlorine residual and turbidity analyzers monitor water entering the distribution system. A natural gas generator supplies emergency backup power.

The WVW system has 90 residential connections and one (1) institutional connection. There are no industrial or agricultural customers on this system.

The water system is outlined below:

- The 715 Franklyn Road site has the following:
 - The pump house contains the two (2) distribution pumps to pressurize the distribution system, one (1) fire demand pump, two (2) chlorine dosing pumps, a

chlorine analyser that continuously monitors free chlorine residual, and a turbidity meter that continuously monitors turbidity

- one (1) groundwater well within the well house (Whitevale Well 2)
- one (1) 246 m³ (65,000 US gal) in-ground concrete reservoir
- one (1) backup generator (Genset) to supply backup power, installed in 2017.
- The well water is chlorinated to achieve a free chlorine residual of between 0.4 and 0.9 mg/L as the water leaves the reservoir. The reservoir provides chlorine contact time, and it is then pumped into the distribution system. The objective is to achieve a minimum of 0.2 mg/L at the ends of the distribution system.
- System operation is controlled by a Programmable Logic Controller (PLC) and monitored both locally and remotely with a Supervisory Control and Data Acquisition (SCADA) system with alarms set for pertinent parameters. As of 2017, data is backed up daily to the RDNO office server to minimize lost data. The WVV on-site computer was re-built in 2021 to allow the complete database, trends and display, to be copied to the office server during regular backups for greater system security.
- The capacity of the WVV reservoir is 246 m³ and the flow of the fire demand pump at normal distribution pressure is 37.8 L/sec. To meet the FUS for single family residential, the reservoir would require a minimum storage capacity of 324 m³ for fire storage (plus additional volume for maximum day demand and 25% for emergency storage) and 60 L/s minimum for fire flows. More reservoir capacity and flows are required for multifamily, institutional, commercial and industrial protection. The institutional connection has an on-site reservoir for fire protection that is supplied by the WVV system.

2. WATER SOURCE

The water source for the WVV system is groundwater drawn from a well screened within a confined aquifer. Water quality from this well is good with consistently low turbidity and no *Escherichia coli* (*E. coli*) presence. See sections 5.2.1 and 5.2.2 for more information on source bacteria and turbidity.

3. TREATMENT REQUIREMENTS

The treated water quality objectives for all BC water systems using a groundwater source need to meet different treatment objectives based on their classification as outlined in the Drinking Water Treatment Objectives (Microbiological) for Ground Water Supplies (DWTO). As outlined in the Drinking Water Treatment Objectives (Microbiological) for Surface Water Supplies, wells are classified as either Ground Water at Risk of Containing Pathogens (GARP), GARP-viruses or groundwater wells. GARP wells need a higher level of treatment due to the higher risk of pathogens, GARP-viruses wells only require 4-log removal or inactivation of viruses through chlorination as they are low risk of containing pathogens, and groundwater requires no additional treatment.

WVV is supplied by a well located within a confined aquifer that was classified as a “groundwater source at low risk of containing pathogens” and is not at risk of being GARP or Ground Water Under Direct Influence of Surface Water (GWUDI) (Golder, 2008). As the GARP-viruses classification and treatment objectives were enacted after the WVV well was classified, it is uncertain if the well would fall under GARP-viruses classification; however, as the RDNO already chlorinates to meet 4-log removal or inactivation of viruses, the disinfection requirements under GARP-viruses classification are being met for the WVV well. Even under the worst-case scenario

conditions of summer peak flows, or the failure of one (1) of the chlorine dosing pumps, the required contact time (CT) of 8 min-mg/L for 4-log virus is met (Appendix B). The RDNO chlorinates to both meet 4-log removal of viruses and to maintain residual within the distribution system to protect against regrowth.

OPERATIONS

4. MANAGEMENT

WVW is owned and managed by the RDNO. The Manager, Small Utilities is responsible for the management of the utility and oversees operations with oversight provided by the Utilities, General Manager and the RDNO Board of Directors. The water quality monitoring program is coordinated and monitored by the water quality staff of the RDNO. RDNO operators complete day-to-day operation and maintenance tasks. An RDNO operator will respond to emergencies, 24 hours a day, seven (7) days a week.

Interior Health (IH) is the regulator of water utilities and is responsible for ensuring compliance with legislation and provincial standards. IH issues the Operational Permit (Appendix C) for WVW. The IH representative for WVW is a Drinking Water Officer (DWO) who works closely with the water utility to ensure that WVW remains compliant with all provincial and Federal drinking water legislations. There is no letter on file outlining COPs for WVW.

5. ENVIRONMENTAL OPERATOR CERTIFICATION PROGRAM (EOCP) CLASSIFICATION

The WVW is classified as a Small Water System (SWS) and is certified by the EOCP as SWS Facility No. 0411221.

See Table 1 for the list of the operators certified through the EOCP and employed by RDNO. The RDNO operators are responsible for operating and maintaining the source, treatment, and distribution systems as well as sampling as outlined in the water quality monitoring program.

The operator duties include on-site checks of the facilities at least two (2) times per week with continual monitoring by the SCADA system with set alarms, with operators signing in to check the SCADA system at least once per day. All maintenance items are performed by the operator. All alarms are responded to by an operator. If immediate attention is required, the operator will proceed to the site to respond. If required, the system operator will contact management for guidance or assistance.

6. OPERATIONS PROGRAMS

6.1. FLUSHING AND HYDRANT MAINTENANCE

Fire hydrant maintenance and annual water main flushing is undertaken by Teale's Water Utility Service (Teale's) of Vernon and was completed in summer 2023 and fall 2024.

There are two (2) dead-ends in the system where blow-offs are installed. These blow-offs are flushed as needed to maintain the water quality in the system by the system operator. These blow-offs are located at:

1. 808 Fraser Road
2. 792 Eastwood Road

6.2. CROSS CONNECTION CONTROL PROGRAM


The RDNO has a Cross Connection Control Program (CCCP) for all water utilities owned by the RDNO, including WVV. The CCCP is focused on identifying high and medium backflow risks and ensuring annual compliance of Backflow Prevention Device (BPD) testing for these facilities. Currently, all connections in Whitevale are residential and therefore considered low backflow risk according to standards, except for the school, which was reopened in 2022 after being closed for a number of years and is considered medium hazard. In 2023 and 2024, a double check valve assembly on the fire reservoir and a reduced pressure principle backflow prevention assembly on the boiler were tested at the school location and passed.

SOURCE ASSESSMENT AND WATERSHED PROTECTION PLANNING

Golder Associates Ltd. completed “Preliminary Steps in the Development of a Groundwater Protection Plan, Whitevale, BC” issued in May 2008. The Whitevale Well 2 installed in the summer of 2006 was classified as being completed within a confined aquifer and was constructed to BC Groundwater Protection Regulation standards with the surface annular seal extending into the confining aquifer (Golder, 2008).

The highest risk identified to the Whitevale Well 2 was the old Whitevale Well 1, which was subsequently decommissioned by filling in the old well with bentonite and capping in June of 2010 (SSS, 2010).

The following signage is posted at the well site to inform Whitevale residents on Groundwater Protection.



Whitevale Community Aquifer


What is an Aquifer?
An aquifer is a natural saturated geological deposit that holds and provides groundwater to wells

Is an Aquifer Naturally Protected from Contamination?
This aquifer has been rated as highly vulnerable. Each aquifer has different levels of vulnerability to contaminants introduced at the land surface. An aquifer's vulnerability depends on its depth and degree of confinement by overlying deposits.

What can You do to Protect Your Aquifer?
Some specific actions you can take include:

Do	Don't
<ul style="list-style-type: none"> <input checked="" type="checkbox"/> Check under ground oil storage tanks for leaks. If they are leaking or not in use, have them removed. <input checked="" type="checkbox"/> Properly maintain your septic system. <input checked="" type="checkbox"/> Fill in any unused wells with proper sealant. <input checked="" type="checkbox"/> Follow farm waste management guidelines. 	<ul style="list-style-type: none"> <input checked="" type="checkbox"/> Apply pesticides or fertilizers near a well. <input checked="" type="checkbox"/> Use toxic chemicals on your driveway. <input checked="" type="checkbox"/> Flush chemicals, oils or paint down your toilet. Recycle. <input checked="" type="checkbox"/> Store piles of garbage or manure within 100 meters of a well.

If you'd like to know more about how to protect your aquifer, please call the Regional District of North Okanagan at 250.550.3700



WATER QUALITY MONITORING

The goal of the water quality program at WVV is to monitor the quality of the raw water and treated water within the distribution system to detect the presence of microorganisms or other issues that can degrade water quality. Operations staff can respond to correct any issues or appropriately notify customers as required.

7. PROGRAM AND SCHEDULE

Water quality monitoring for WVV is based on the requirements of the Drinking Water Protection Regulation (DWPR) Schedules A and B (Government of BC, 2003), the Guidelines for Canadian Drinking Water Quality (GCDWQ) (Health Canada, 2017), and the Drinking Water Treatment Objectives (microbiological) for Ground Water supplies in British Columbia (Health, 2015).

The Water Quality Monitoring Program for WVV is reviewed and updated annually in January of the current year. The updated sampling program and schedules for 2023 and 2024 are provided in Appendix D. The RDNO provides an updated Water Quality Monitoring Plan to IH at the beginning of each year after the program is developed. Included in the Water Quality Monitoring Plan is the monitoring schedule, parameters, and frequency of samples taken.

To meet Schedule B in the DWPR for populations with less than 5,000 people, a minimum of four (4) microbiological samples are required per month. In 2023 and 2024, WVV met this requirement.

Bacterial samples are collected by RDNO staff and are processed for shipment to CARO Analytical Services (CARO). CARO provides results to IH and the RDNO, where staff uploads the results to the RDNO database.

8. SOURCE

This section outlines the bacterial, turbidity, pH, temperature, and annual chemical results for 2023 and 2024 raw water at WVV.

8.1. BACTERIA

At least one (1) monthly raw water sample is collected from the well. The WVV system has a good microbial history as demonstrated in Table 2 which summarizes the source water bacterial results from CARO.

Total Coliforms and E.coli are monitored as indicator bacteria to assess changes or contamination in the raw water.

In both 2023 and 2024, the Total coliform and E.coli results in the raw water had all recorded results of < 1 CFU / 100 mL (Table 2).

8.2. TURBIDITY

Turbidity measurements relate to the optical properties of water. Turbidity is caused by suspended matter such as clay, silt, finely divided organic and inorganic matter, soluble coloured organic compounds, and other microscopic organisms. Excessively high turbidity can have a negative effect on disinfection techniques and changes to turbidity in a groundwater source well can indicate a cross connection or issue with the source. A provincial guidance document issued in April 2013, the Decision Tree for Responding to a Turbidity Event in Unfiltered Drinking Water (Ministry of Health, 2013) assists the RDNO during turbidity events and communication with the water customers.

Turbidity of the raw water in the WVV Well 2 is historically below 1 NTU (Figures 1-3). 2024 saw a slightly elevated turbidity with higher peaks and elevated baseline when compared to 2023. The average in 2024 was 0.09 NTU compared to an average of 0.06 NTU in 2023, both well below

the turbidity limit of <1 NTU of the DWO. The historical graph from 2017-2024 (Figure 3) shows a drop in the baseline turbidity at the beginning of 2020 before turbidity baselines start to increase in 2024. These turbidity fluctuations are of small scale, most likely naturally caused, and have little impact on drinking water quality at these levels.

8.3. FIELD PARAMETERS

The Canadian Drinking water guideline for source temperature is an Aesthetic Objective (AO) guideline at 15 °C, and the Canadian Drinking water guideline for pH is a range of 7.0-10.5 to maximize treatment effectiveness. All field results for the raw water were within applicable guidelines, as seen in Figures 4-9.

8.4. ANNUAL COMPREHENSIVE

Comprehensive sampling is conducted annually. The annual sampling is rotated between spring and fall to ensure the groundwater meets water quality guidelines during different times of the year. The 2023 and 2024 comprehensive samples were taken in October. All parameters were well within the GCDWQ limits (Appendix E).

9. TREATMENT PROCESS

WVW was classified as a non-GARP well but is treated with chlorine for 4-log virus removal and hence would be compliant for treatment for a GARP-viruses classification. This classification is further demonstrated by the stable water quality throughout the year with a consistently low chlorine demand.

9.1. TURBIDITY

Under normal operations, the water turbidity leaving the reservoir is <0.20 NTU. Continuous online turbidity monitoring is completed with an analyzer that monitors the turbidity after water passes through the reservoir and enters the distribution. In the event of high-level turbidity, an alarm will notify the on-call operator to address the situation. Table 3 summarizes the monthly average SCADA turbidity in 2023 and 2024. These values see nominal fluctuations year over year but overall remain quite consistent and well below the 1 NTU limit.

9.2. CHLORINE

Under normal operations, the target chlorine residual in the water leaving the reservoir is >0.7 mg/L depending on demand in the system. This target is to maintain a minimum residual of free chlorine of 0.20 mg/L at the end of the distribution system. Chlorine is injected into the well supply line before water enters the reservoir. Continuous online chlorine monitoring is completed with an analyzer that monitors the free chlorine after water passes through the reservoir. In the event of a low-level chlorine alarm, the system will notify the on-call operator to avoid low free chlorine residual water entering the distribution system. See Table 3 for average monthly chlorine residuals.

10. DISTRIBUTION

Distribution sampling follows the WVW Water Quality Monitoring Program as outlined in Appendix D. Additional parameters and monitoring can occur for individual projects.

Operators record the field parameters on an electronic operator log sheet, which is backed up to the RDNO system by water quality staff monthly. Field parameters are also recorded on the Interior Health requisition sheets, which are sent to CARO with the bacterial samples, and entered into ENKI (software program).

10.1. BACTERIA

Schedule A of the DWPR requires the following criteria be met for potable water:

1. No detectable Escherichia coli (E.coli) per 100 ml.

In 2023, there were 53 samples analyzed using the CFU/100mL method and nine (9) samples analyzed using the MPN/100mL method.

In 2024, there were 50 samples analyzed using the CFU/100mL method and eight (8) samples analyzed using the MPN/100mL method.

All samples for both years were non-detect for E.coli in the WWV distribution system.

2. At least 90% of samples have no detectable Total Coliform bacteria per 100 ml.

In 2023, there were 53 samples analyzed using the CFU/100mL method and nine (9) samples analyzed using the MPN/100mL method.

In 2024, there were 50 samples analyzed using the CFU/100mL method and eight (8) samples analyzed using the MPN/100mL method.

All samples for both years were non-detect for Total Coliforms in the WWV distribution system.

3. No sample has more than 10 Total Coliform per 100 ml.

In both 2023 and 2024, no samples had more than 10 Total Coliform (Table 4).

The results met the GCDWQ and DWPR and Table 4 summarizes the distribution bacterial results.

10.2. TURBIDITY

Turbidity is monitored with a handheld turbidity meter at the reservoir at least twice per week and the two (2) distribution sites at least once per week. Turbidity in 2023 remained constant with marginal changes at the three (3) sampling sites (Figure 10). Turbidity in 2024 also remained constant with marginal changes at the three (3) sites with the exception of a small increase in turbidity on December 10 with values of 0.4 NTU - 0.5 NTU (Figure 11). This coincides to the increased turbidity noted in the source water on December 9 and 10. All samples within the distribution system in 2023 and 2024 remained well below the DWQG of <1 NTU.

10.3. CHLORINE

Free and total chlorine is monitored with a handheld chlorine meter concurrently with the turbidity readings. Although total chlorine is monitored, only free chlorine is reported as that is the chlorine in the water that is readily available for disinfection. Both 2023 and 2024 saw free chlorine

readings fluctuate between 0.6 and 1.0 mg/L with one (1) reservoir reading each year above 1.0 mg/L (Figures 12 and 13).

There is very little chlorine degradation in the distribution as demonstrated by comparing the reservoir chlorine values to the distribution samples sites (808 Fraser SS and 792 Eastwood SS). This lack of chlorine consumption in the system indicates good water quality and provides additional evidence that the source water classification of not being GARP is valid as pathogens are organic and would consume chlorine.

10.4. FIELD PARAMETERS

Field parameters were checked twice per week in 2023 and 2024. There were no instances where pH was below the 7.0 GCDWQ guideline in 2023 nor 2024. This guideline is in place to prevent erosion and leeching of pipes as well as to monitor for source water changes and system contamination. Conductivity in 2023 remained relatively stable with nominal fluctuations throughout the year. Conductivity in 2024 was slightly elevated to approximately 285 uS/cm between March and June before returning to the approximately 265 uS/cm as seen in 2023. Temperature in both 2023 and 2024 showed an expected seasonal fluctuation from a low of approximately 4-5 degrees Celsius near the beginning of April to a high of approximately 16 degrees near the end of August. The reservoir remained consistent at 8-9 degrees Celsius throughout the year. There are no guidelines associated with conductivity or temperature. All field parameters can be seen in Figures 14-19.

10.5. DISINFECTION BY-PRODUCTS

Disinfection by-products (DBP) trihalomethanes (THMs) and haloacetic acids (HAAs) are not sampled at WVV. These parameters are not a concern for this utility, as groundwater usually does not contain organic materials which react with chlorine to form THMs (Connell, G. F., 1996). The low degradation of chlorine within the distribution system outlined in Section 5.4.3 provides evidence of the low to no presence of organics.

WATER CONSUMPTION

Table 5 and Figures 20 and 21 provide the total monthly consumption within the Whitevale subdivision in 2023 and 2024. Figure 22 provides a historical graph of the monthly consumption from December 2018 - 2024. Water use within the WVV system is mostly residential with one (1) institutional property; therefore, flows are variable depending on the time of day and seasonal demands. 2023 water usage was generally above average from January until August at which point it was under or near the 2018-2022 average. It was noted that the Whitevale water utility showed new historical maximum values for each day between the middle of February to the middle of April. Leak detection occurred on the water system May 1, 2023, and a leak was discovered on Franklyn Rd. It was repaired on May 18, 2023, and would most likely account for the increase in water usage during this time. In contrast, 2024 water usage was almost exclusively below the 2018-2023 historical average, running near or below the historical lows for most of the year. There was a large spike in usage in the middle of December due to a service leak, followed by a large drop in consumption at the end of the year once the service leak was repaired.

Water consumption generally begins to significantly increase in June with peak consumption usually observed in July and August (Figures 20 and 21). Consumption corresponds with outdoor water usage. In 2023, it was noted that water consumption spiked in the middle of May before dropping to near normal levels near the end of May. This spike in usage could be attributed to

people preparing water reserves in preparation of the planned shutdown on May 18 in order to repair the water main leak noted above.

Based on the consumption provided in Table 5, the daily average water use based on 90 houses and an average of 2.51 persons per house in 2023 and 2024, is as follows:

- Winter water use was approximately 458 L/d/p in 2023 and 296 L/d/p in 2024. This is considered to represent indoor domestic water use only. This is very high water-use, for instance, Greater Vernon Water (GVW) average winter water use is 147 L/d/p.
- Peak water use occurred in July in both 2023 and 2024. Average summer water usage (water used from July – September) in 2023 was 696 L/d/p with peak water usage occurring in July at 971 L/d/p. Average summer water usage in 2024 was 541 L/d/p with peak water usage occurring in July at 749 L/d/p. This is very high water-use considering that it is primarily a single-family residential subdivision. For reference, GVW average summer residential water use is 320 L/d/p.
- The average annual water use in 2023 was 566 L/d/p, while in 2024 it was 383 L/d/p, which are both considered high compared to the 2024 GVW average, which is 200 L/d/p and the Canadian average of 223 L/d/p¹.

The water use for WVV is considered high compared to metered water utilities. Some of this can be attributed to water loss within the system instead of water usage, such as main breaks and flushing activities. In metered utilities, this is attributed to loss, and this is not counted towards the per person average water use, whereas an unmetered utility will have this considered water used by the customers; however, in 2024, there was only one (1) small service leak detected and fixed quickly and the per person water use was still much higher than GVW. WVV currently has voluntary restrictions which are odd / even watering days based on address, which can be enforced by the Small Utilities Rates and Regulations Bylaw. The RDNO monitors the Bessette watershed conditions closely and issues regulated water restrictions based on drought conditions as needed.

EMERGENCY RESPONSE PLANNING

11. THE ERP

A comprehensive update of the WVV Emergency Response Plan (ERP) was completed in 2024 and reviews are completed annually. Sampling methods and RDNO small utility ERP training for the operators also occurs annually.

RDNO operators are instructed on how to use the following supporting documents in times of water quality changes or emergencies:

1. WVV Emergency Response Plan
2. WVV Water Quality Deviation Response Plan

The above documents contain the contacts, criteria, and procedures necessary to assist operators and staff to make timely, informed decisions.

WVV must inform customers when their drinking water does not meet standards with the appropriate notifications based on risk. A Water Quality Advisory (WQA) is released when the

¹ Statistics Canada, 2021 - <https://www150.statcan.gc.ca/t1/tbl1/en/tv.action?pid=3810027101>

water poses a modest health risk. A Boil Water Notice (BWN) is released when there is a known or higher risk of a possible health impact to the customer. In consultation with IH, the WVV Water Quality Deviation Response Plan contains information on when to implement and WQA and when to implement a BWN.

An advisory or notice is delivered as quickly and efficiently as possible. Notification may include WQA or BWN road signs, radio, email, and / or media releases. Under specific circumstances notification is hand-delivered. Customers are advised to subscribe to the Whitevale Water Mailing List by going to <https://www.rdno.ca/subscribe> and subscribe for Whitevale Water email updates (shown below).

Please select the type of information you would like to receive *

- All RDNO News
- Area B News
- Area C News
- Area D News
- Area E News
- Area F News
- The Board Bulletin - News and Updates from the RDNO
- Delcliffe Water
- Emergency Management
- Events
- Greater Vernon Water Notices
- Greater Vernon Water Agricultural Customers
- Greater Vernon Water Source Changes
- Grindrod Water
- GVW Non-Potable Water Updates
- Mabel Lake Water and Sewer
- Outback Water
- Parks and Trails
- Recreation and Culture
- Silver Star Water
- Swan Lake Residential Infill Project
- Wastewater Recovery Project
- Whitevale Water
- Waste Management

Submit

12. INCIDENT TRACKING and NOTIFICATION

Three (3) incidents were recorded for 2023, and two (2) incidents were recorded for 2024 and required public notification. Summaries of these are provided in Table 6.

RDNO Emergency Response Procedures require that incidents be reported. An incident is defined as a deviation from normal operating procedure or a water quality issue. Incident reporting allows staff to track and review issues to assess if improvements could be made to reduce the likelihood of the same type of incident occurring again or to reduce the risks to the system or customers.

Public notifications issued in 2023 and 2024 were related to leak detection, water infrastructure work, equipment failure, and water restrictions. There were no water main breaks in 2023 or 2024.

REPORTING REQUIREMENTS

Monthly and annual reports are submitted to IH as per the OP and are available to the public at the RDNO website (www.rdno.ca/ww). Monthly reports for the last 12 months are available on the website. If additional historical reports are required, please contact the RDNO at 250-550-3700.

WORKS COMPLETED IN 2023 / 2024

- Fire Pump Starter and Pressure Relief Valve (PRV) – A new fire pump starter and PRV were purchased and installed in 2023.
- Leak Detection – Leak detection was completed on the distribution system in May 2023, as higher-than-normal water consumption had been noted for an extended period of time. A water service leak on the utility portion of the service was discovered and repaired.
- Confined Space Assessments – These were completed in 2024.

PLANNED WORKS

13. 2025 WORK PLANS

Works planned for 2025 include:

- Spare well pump – Purchase a spare well pump to have on hand in the event existing pump fails.

14. LONG-TERM PLANS

WVW is a small water utility that meets provincial water quality and treatment requirements and development is static with no foreseeable growth, hence no projects for enhanced treatment or expansion are planned at this time. An Asset Management Investment Plan was completed in 2018 for all RDNO small utilities that included WVW. This information has been incorporated into the financial plans and rate structure for WVW to plan for renewal requirements and ensure a sustainable water utility into the future.

CLOSING

The RDNO has made significant strides in fulfilling the RDNO program objectives, meeting provincial standards and requirements outlined by IH, and in implementing BC's DWPA and DWPR at WVW. The RDNO will continue to move forward on implementation of system improvements within the constraints of the WVW budget and through applications for grant funding.

TABLES

Table 1: RDNO Water Treatment Operators

2023 / 2024 RDNO Operators			
Last Name	First Name	Certification #	Certification Held
Tucker	Chris	6489	WTIV, WDII
Hartwig	Corey	9378	WTI
Heidt	Dustin	4498	WDIII, WTIV
McGaw	Becky	9086	WTIII
Radu	David	1002040	WTII
Cimon	Caroline	1001075	WTII, WWTII
Beckett	Jemma	1001610	WTII
Lockwood	Ryan	1000755	WTII, WDI

Table 2: Raw Water Bacterial Results for Whitevale Well 2

2023 Raw Water Bacterial Counts				
	Min	Max	Average	# Samples
Total Coliform (MPN/100 mL)	<1	<1	<1	12
E.coli (MPN/100 mL)	<1	<1	<1	12

2024 Raw Water Bacterial Counts				
	Min	Max	Average	# Samples
Total Coliform (MPN/100 mL)	<1	<1	<1	12
E.coli (MPN/100 mL)	<1	<1	<1	12

Table 3: Monthly Reservoir Free Chlorine and Turbidity SCADA Data

2023 SCADA Monthly Average		
Month	Free Chlorine (mg/L)	Turbidity (NTU)
January	0.79	0.04
February	0.77	0.06
March	0.88	0.06
April	0.87	0.06
May	0.80	0.05
June	0.86	0.06
July	0.79	0.05
August	0.76	0.07
September	0.82	0.06
October	0.83	0.06
November	0.83	0.05
December	0.86	0.06
Monthly Min	0.76	0.04
Monthly Max	0.88	0.07
Monthly Average	0.82	0.06

2024 SCADA Monthly Average		
Month	Free Chlorine (mg/L)	Turbidity (NTU)
January	0.89	0.06
February	0.90	0.05
March	0.91	0.06
April	0.87	0.07
May	0.79	0.05
June	0.81	0.07
July	0.85	0.05
August	0.77	0.05
September	0.81	0.07
October	0.79	0.07
November	0.88	0.11
December	0.97	0.09
Monthly Min	0.80	0.03
Monthly Max	0.91	0.05
Monthly Average	0.86	0.04

Table 4: WVV Distribution Bacteriological Stats Summary for Three (3) Distribution Sites

2023 Whitevale Distribution Bacteria Stats						
	Min	Max	Average	# of CFU/100mL Samples	# of MPN/100mL Samples	# Total Samples
Total Coliform (CFU/100 mL)	<1	<1	<1	53	9	62
E.coli (CFU/100 mL)	<1	<1	<1	53	9	62

2024 Whitevale Distribution Bacteria Stats						
	Min	Max	Average	# of CFU/100mL Samples	# of MPN/100mL Samples	# Total Samples
Total Coliform (CFU/100 mL)	<1	<1	<1	50	8	58
E.coli (CFU/100 mL)	<1	<1	<1	50	8	58

Table 5: Monthly Consumption Data

2023 Whitevale Consumption			2024 Whitevale Consumption		
Month	Total Monthly Consumption (m3)	Average Daily Consumption (m3)	Month	Total Monthly Consumption (m3)	Average Daily Consumption (m3)
January	3,362	108	January	2,890	113
February	2,993	107	February	1,625	56
March	3,487	112	March	1,871	60
April	3,587	120	April	2,070	69
May	4,668	151	May	2,774	89
June	5,248	175	June	3,374	112
July	6,950	224	July	5,362	173
August	4,429	143	August	3,824	123
September	3,400	113	September	2,310	77
October	3,154	102	October	1,856	60
November	3,039	101	November	1,660	55
December	3,195	103	December	2,520	81
Monthly Average	3,959	130	Monthly Average	2,678	89
Monthly Min	2,993	101	Monthly Min	1,625	55
Monthly Max	6,950	224	Monthly Max	5,362	173
Total	47,512		Total	32,136	

Table 6: Incident Summary

2023 / 2024 Whitevale Incidents, Complaints, and Requests		
Cause	Date	Action Items
Power Outage	January 11, 2023	Distribution pressure below guidelines due to loss of power. BWN issued.
Leak Detection	May 1 & 2, 2023	Planned leak detection occurred, and one (1) water service leak was discovered.
Water Service Repair	May 18, 2023	Water service leak repair was accomplished with no depressurization of the water main.
Water Service Repair	April 12, 2024	Water service leak repair was accomplished with no depressurization of the water main.
Loss of water	October 12, 2023	Due to an equipment failure, there was a loss of water in the distribution system. This caused a depressurization of the water main and a BWN was issued.

FIGURES

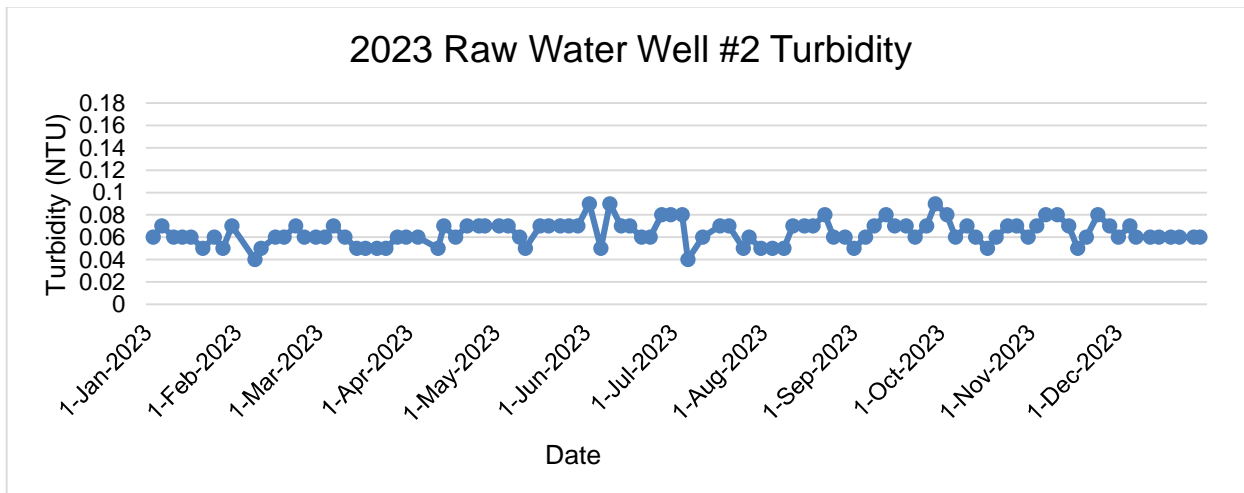


Figure 1: WWV Raw Water Turbidity in 2023

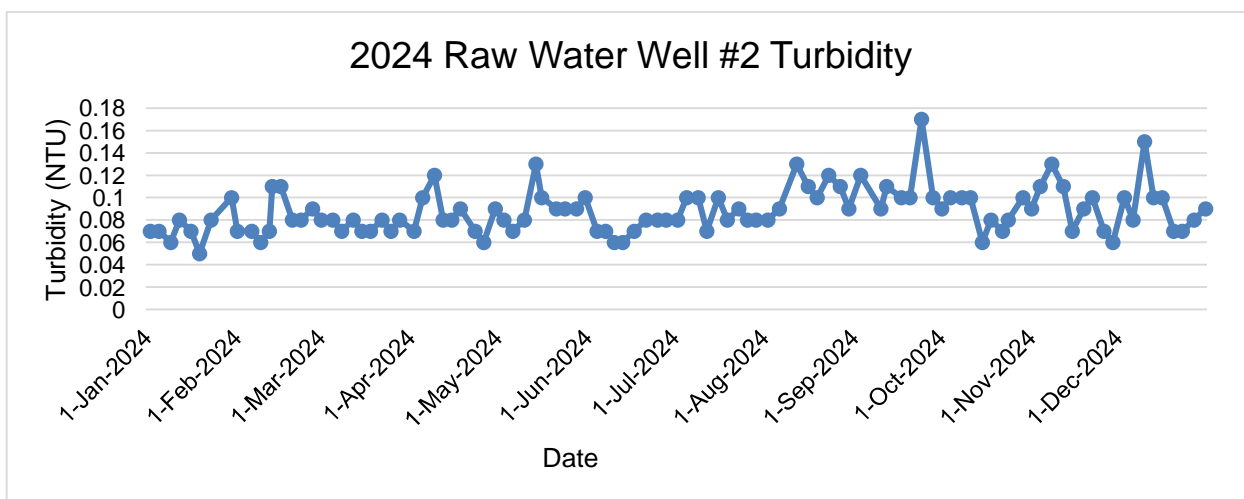


Figure 2: WWV Raw Water Turbidity in 2024

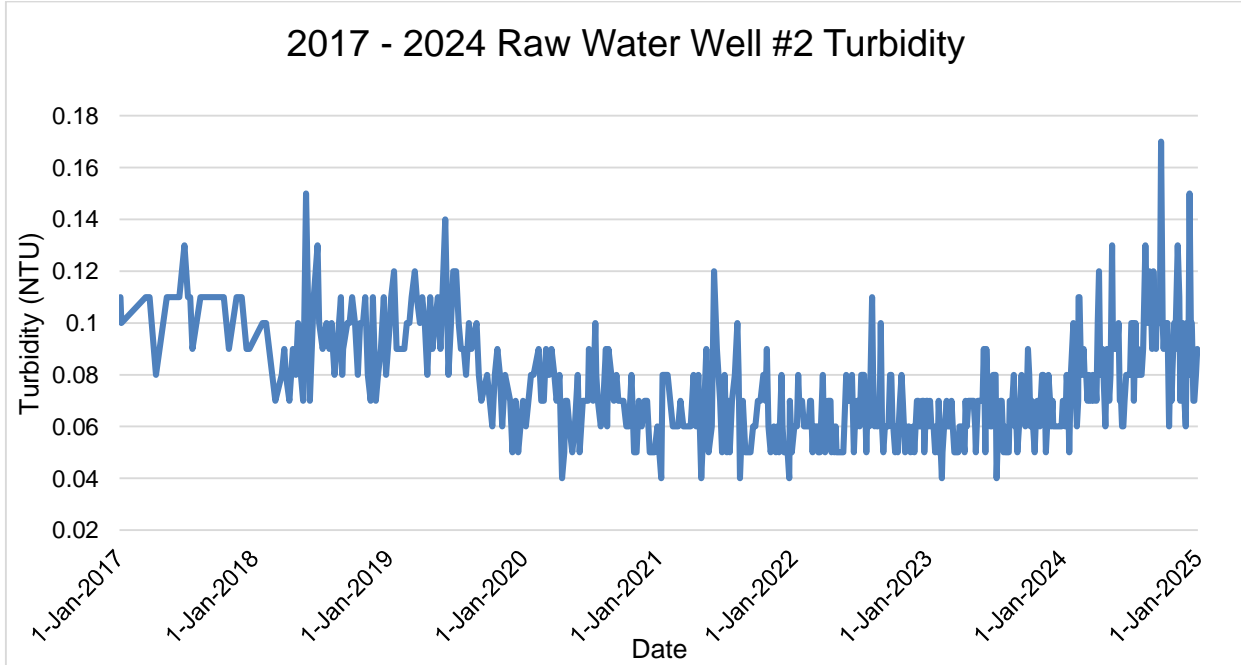


Figure 3: WVV Historical Raw Water Turbidity 2017-2024

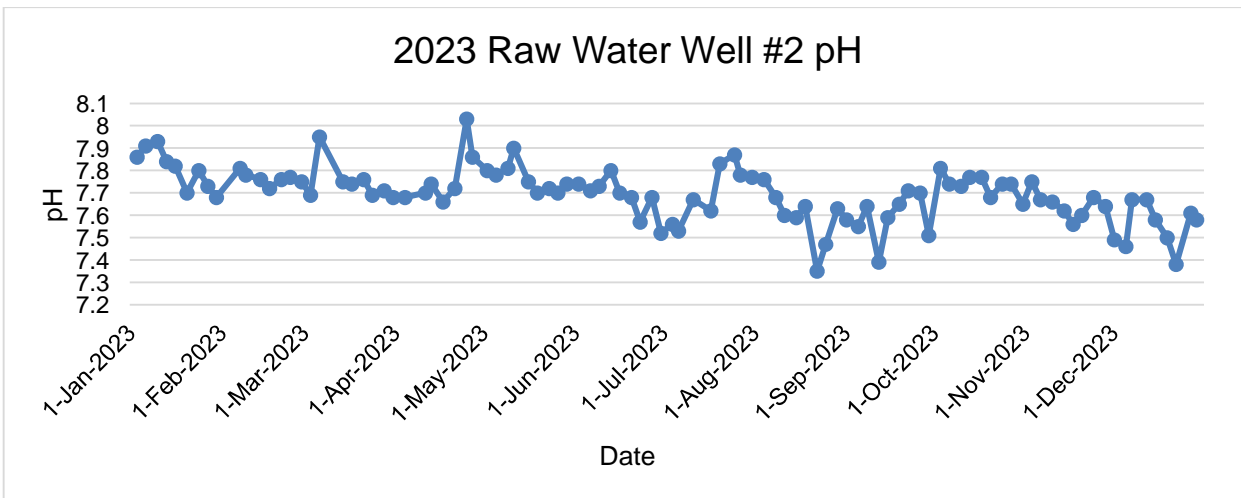


Figure 4: WVV Raw Water pH in 2023

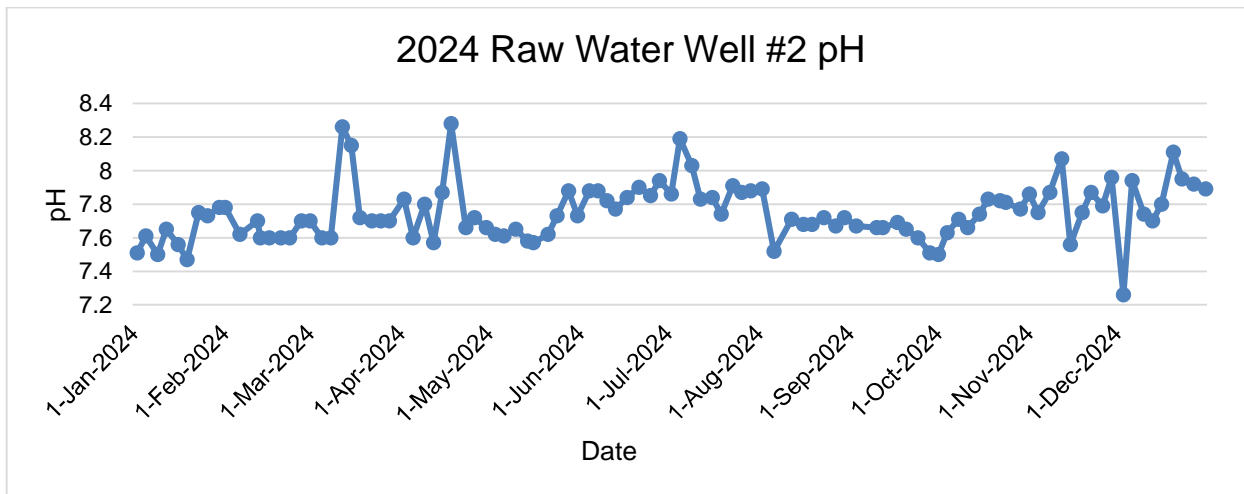


Figure 5: WWV Raw Water pH in 2024

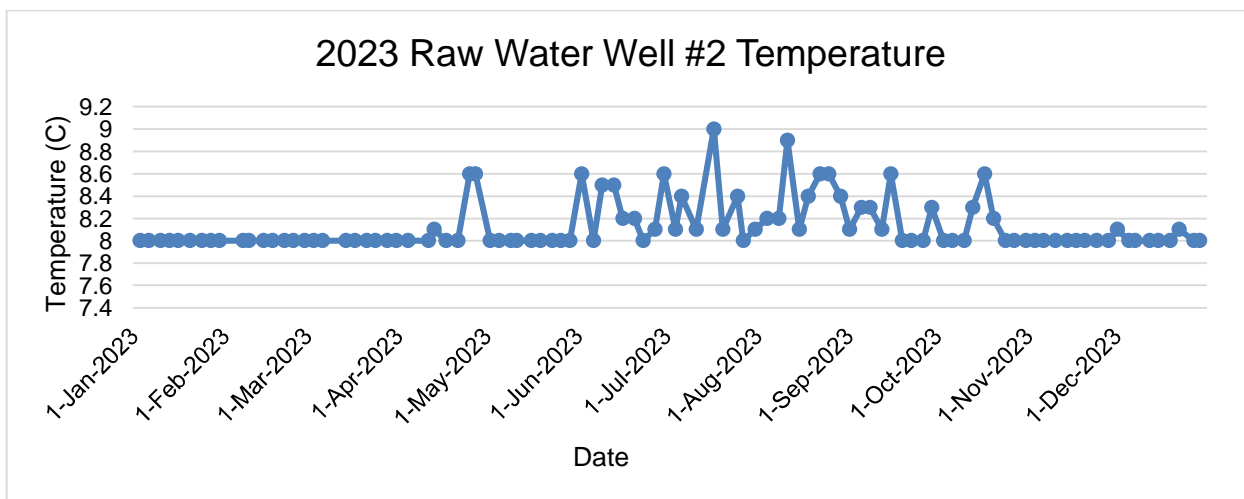


Figure 6: WWV Raw Water Temperature in 2023

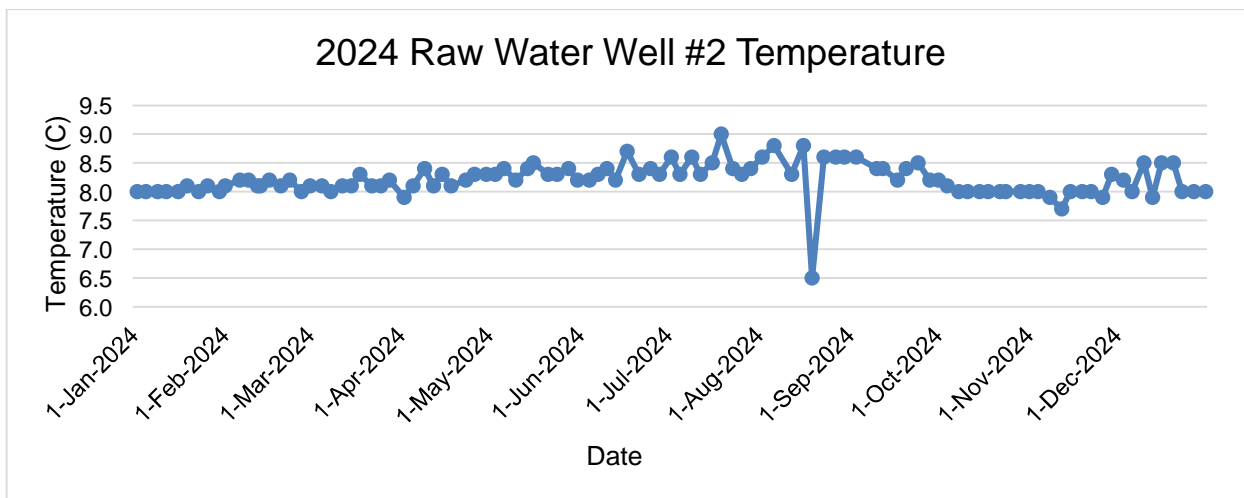


Figure 7: WWV Raw Water Temperature in 2024

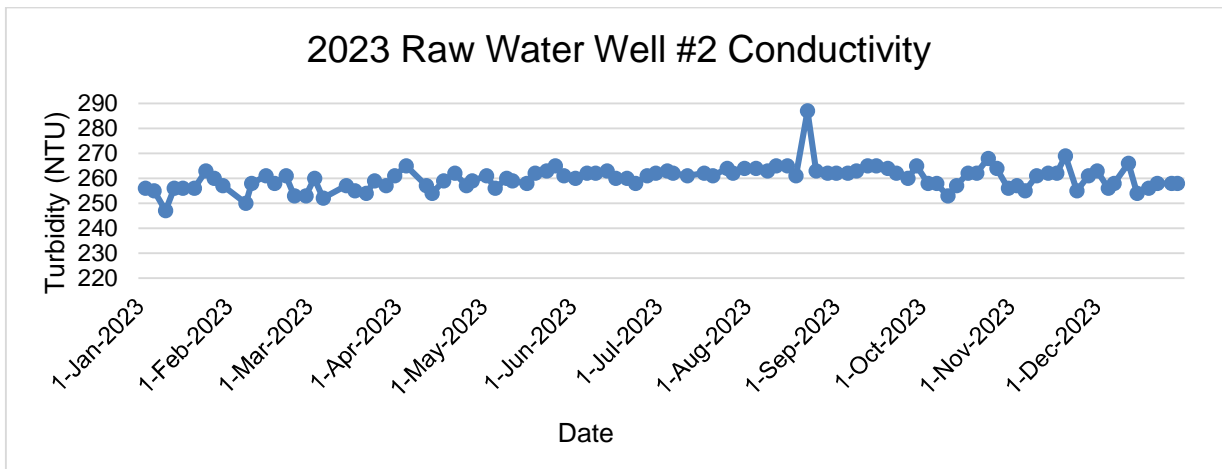


Figure 8: WVV Raw Water Conductivity in 2023

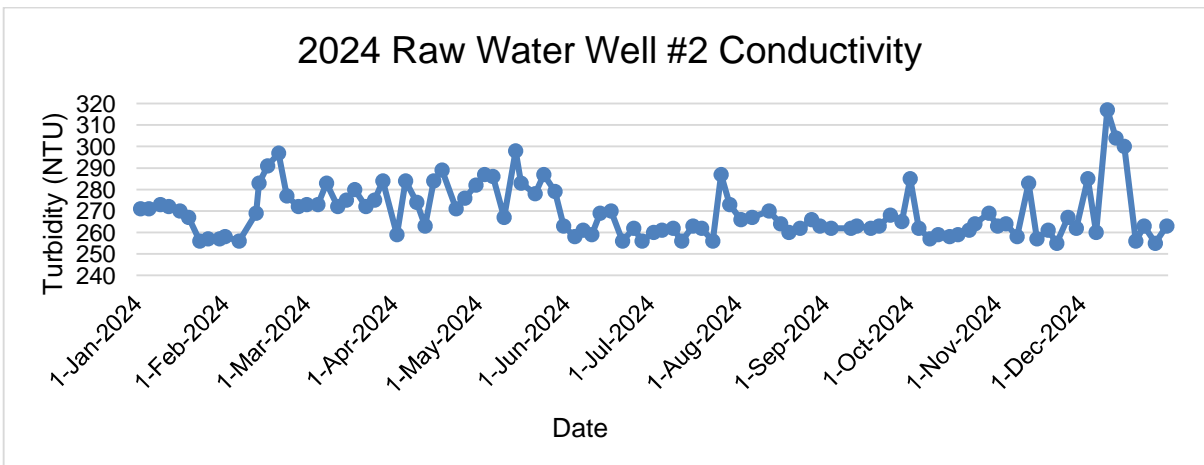


Figure 9: WVV Raw Water Conductivity in 2024

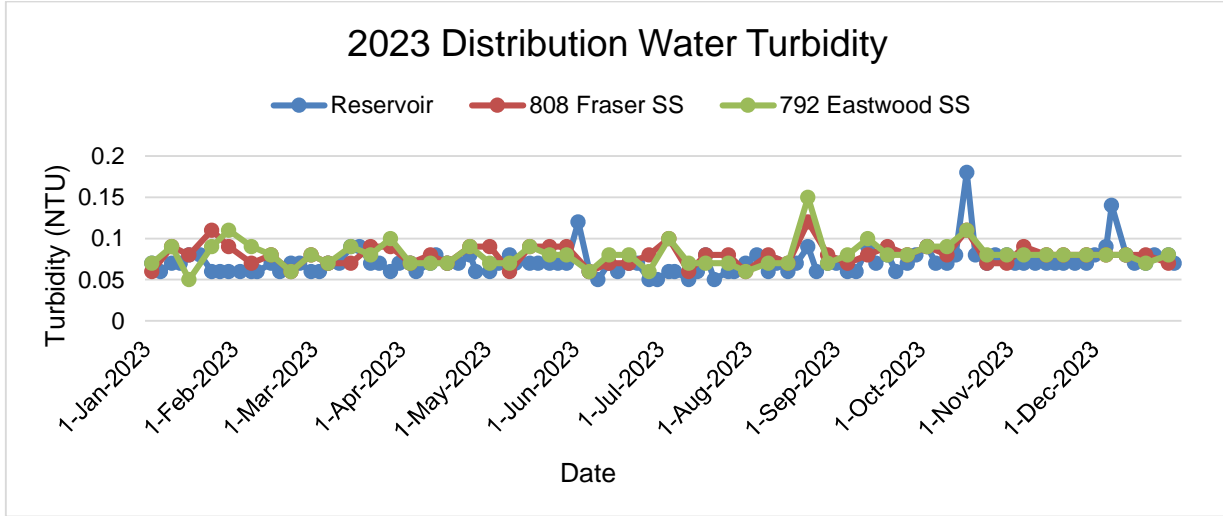


Figure 10: WYW Distribution Water Turbidity in 2023

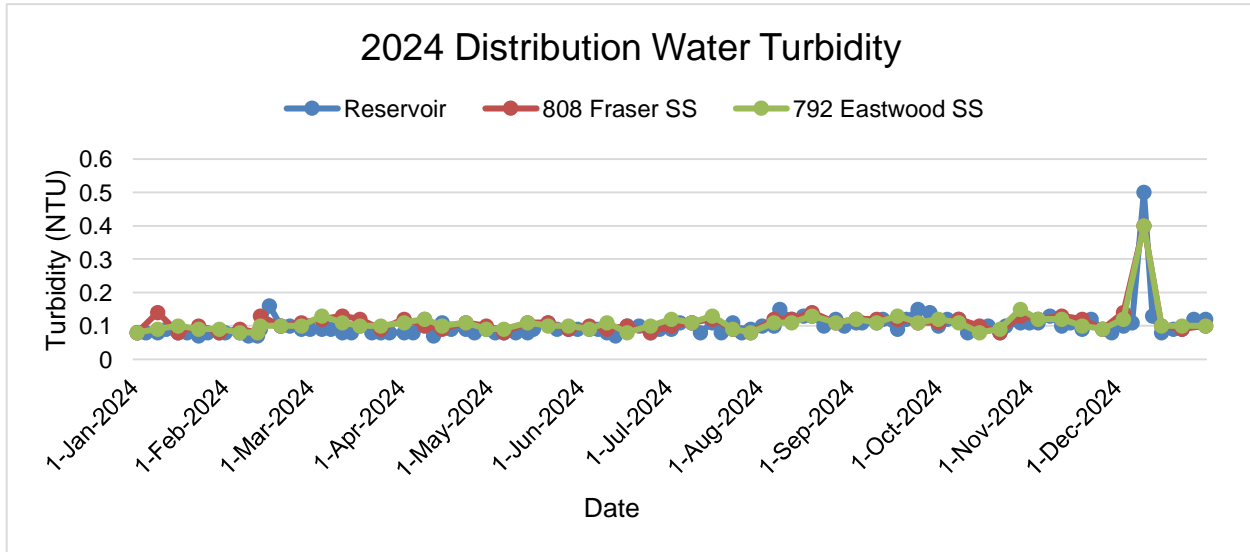


Figure 11: WYW Distribution Water Turbidity in 2024

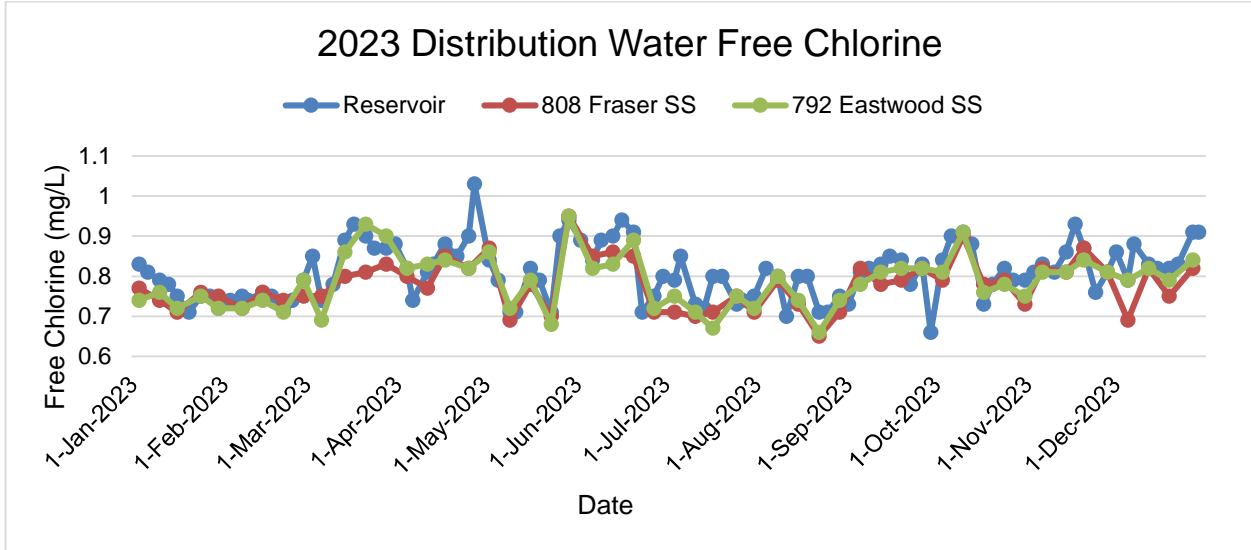


Figure 12: WWV Distribution Water Free Chlorine in 2023

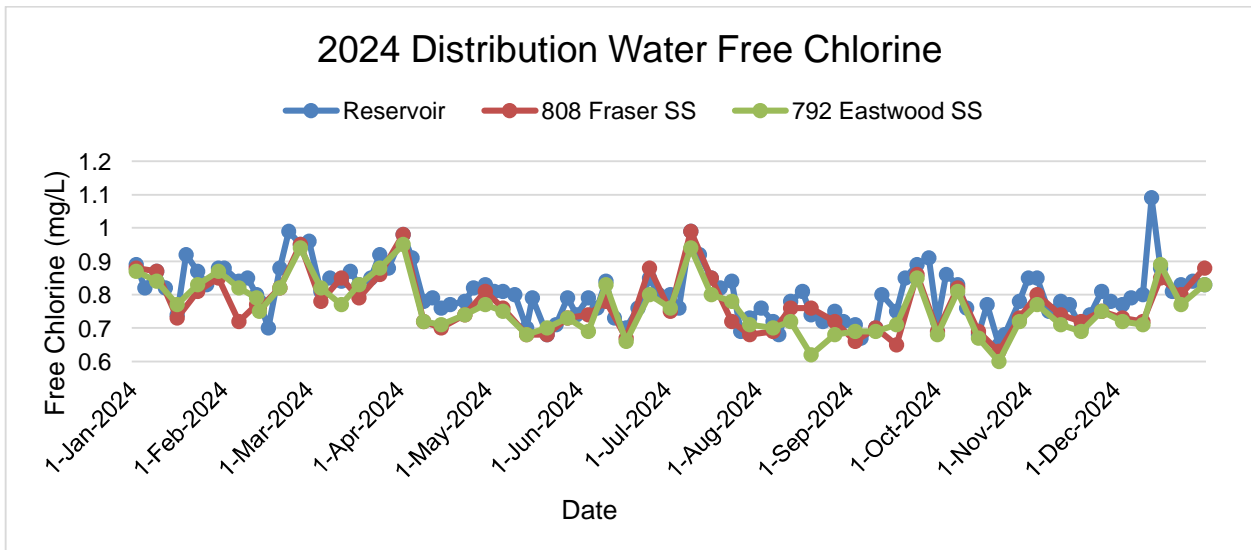


Figure 13: WWV Distribution Water Free Chlorine in 2024

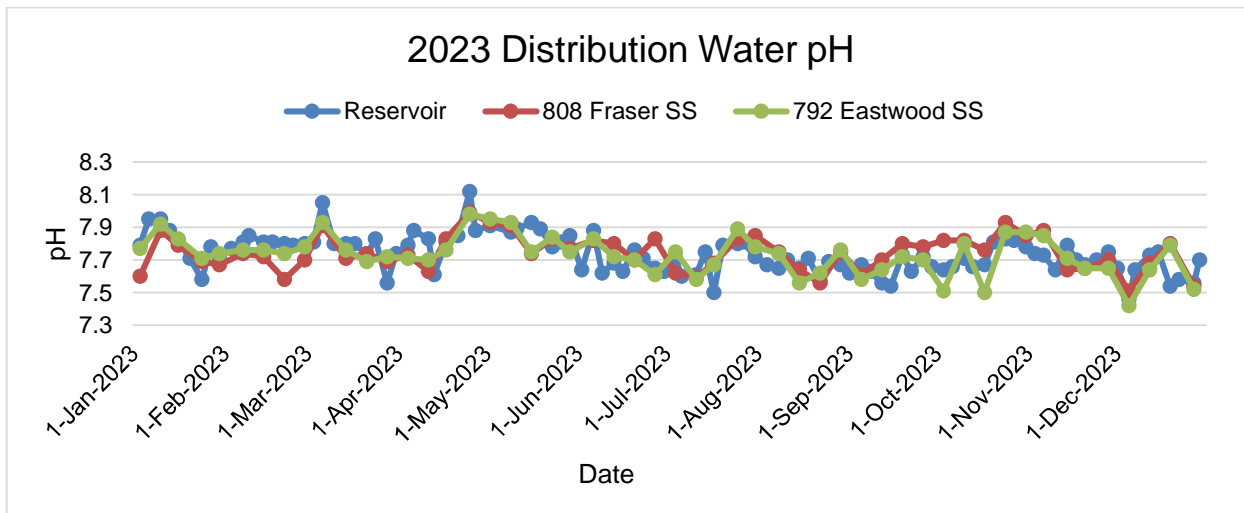


Figure 14: WW Distribution Water pH in 2023

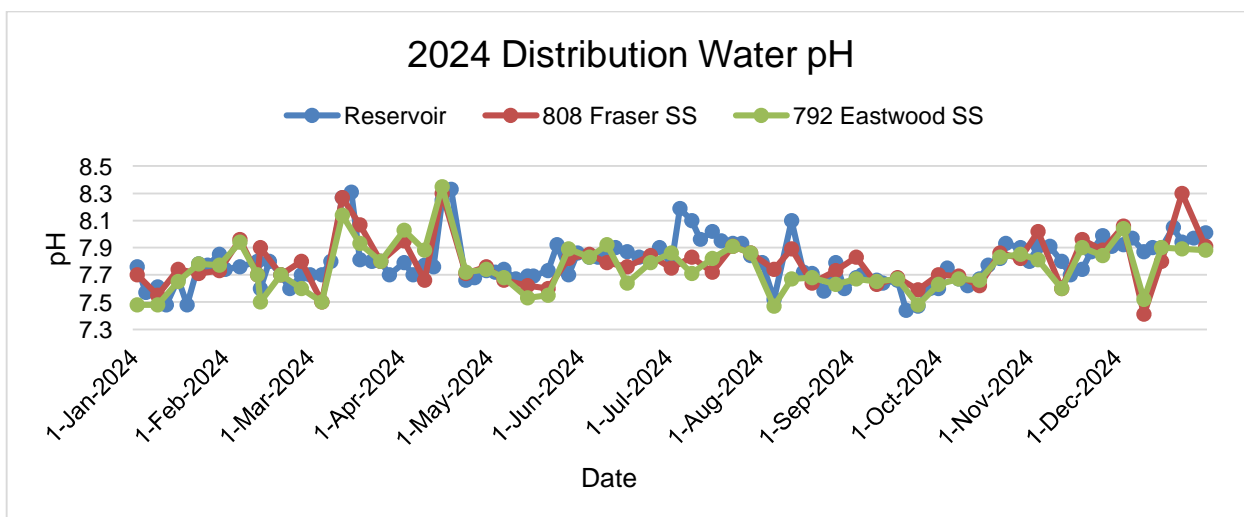


Figure 15: WW Distribution Water pH in 2024

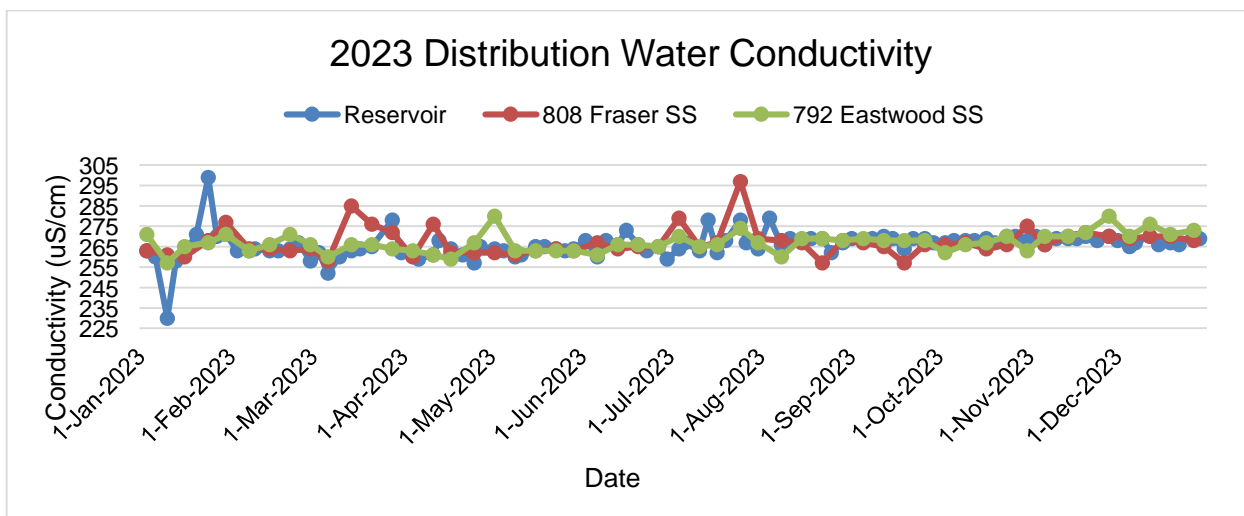


Figure 16: WW Distribution Water Conductivity in 2023

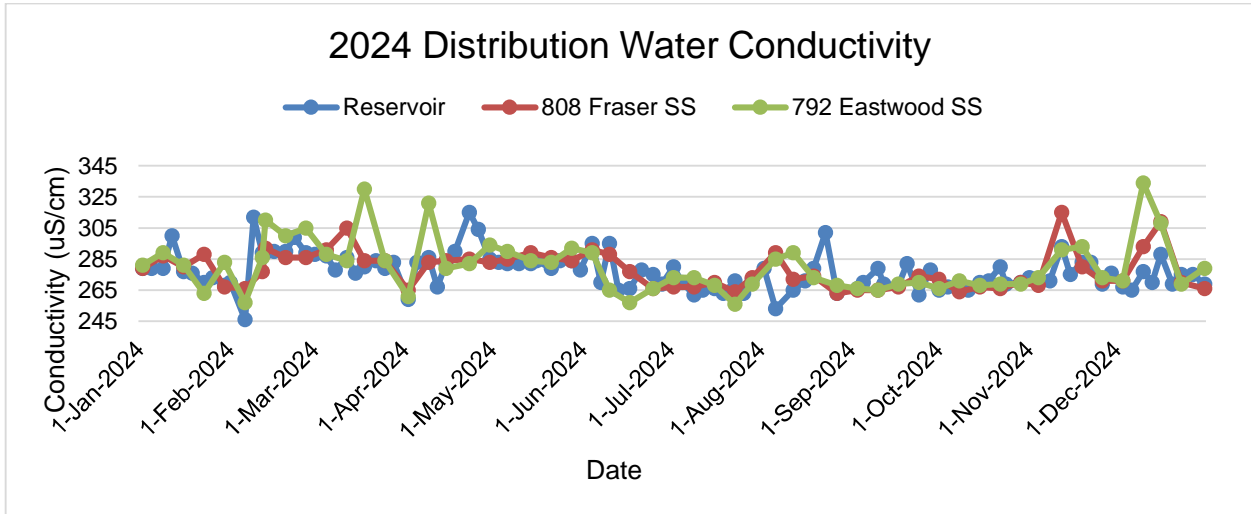


Figure 17: WVV Distribution Water Conductivity in 2024

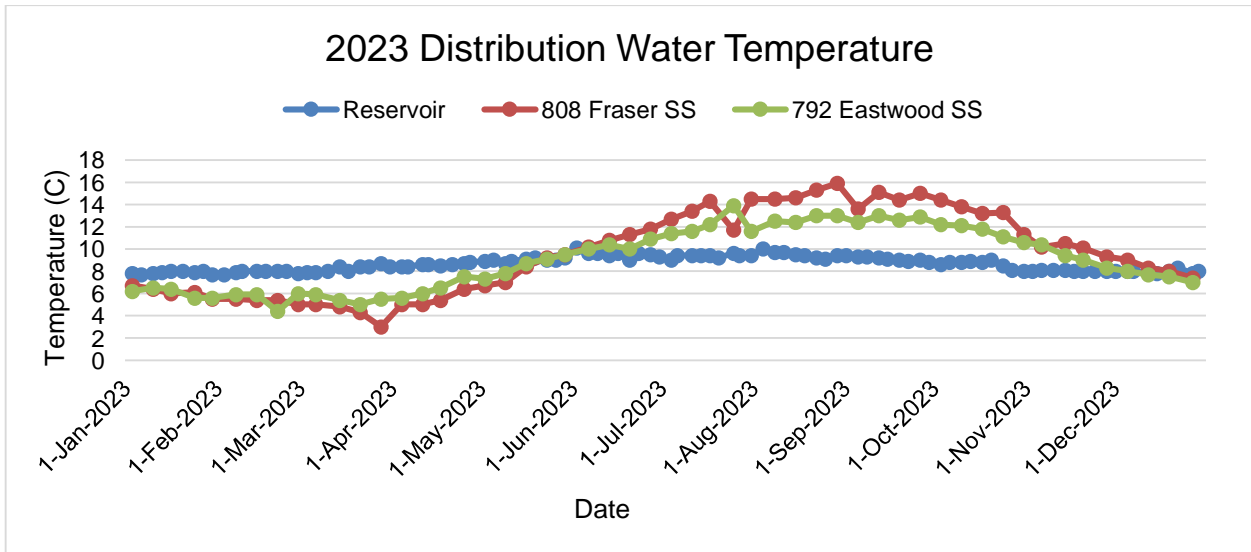


Figure 18: WVV Distribution Water Temperature in 2023

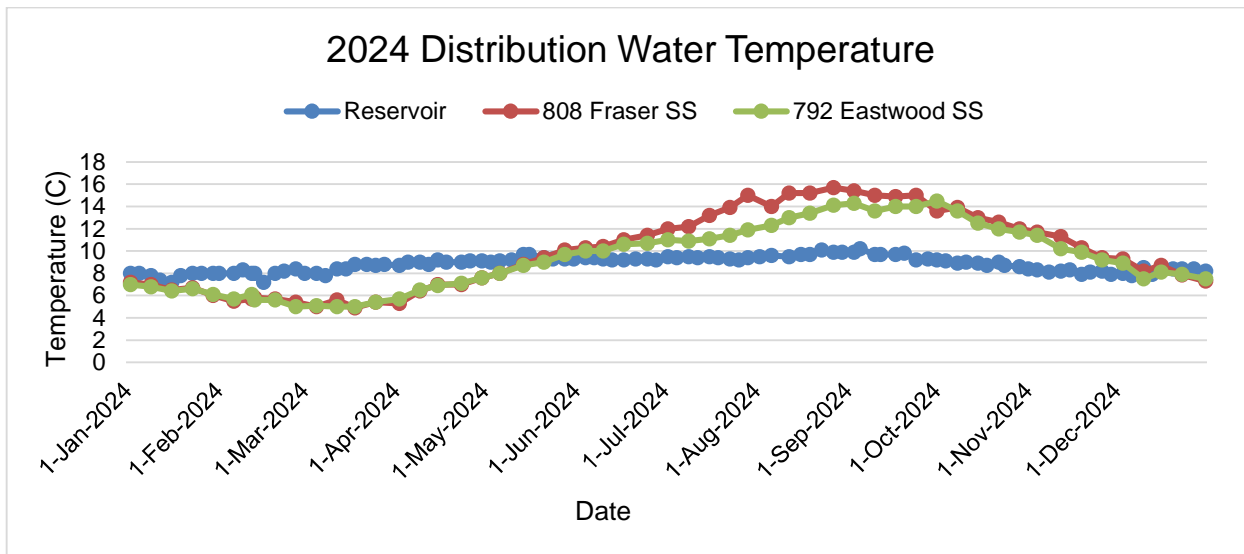


Figure 19: WVV Distribution Water Temperature in 2024

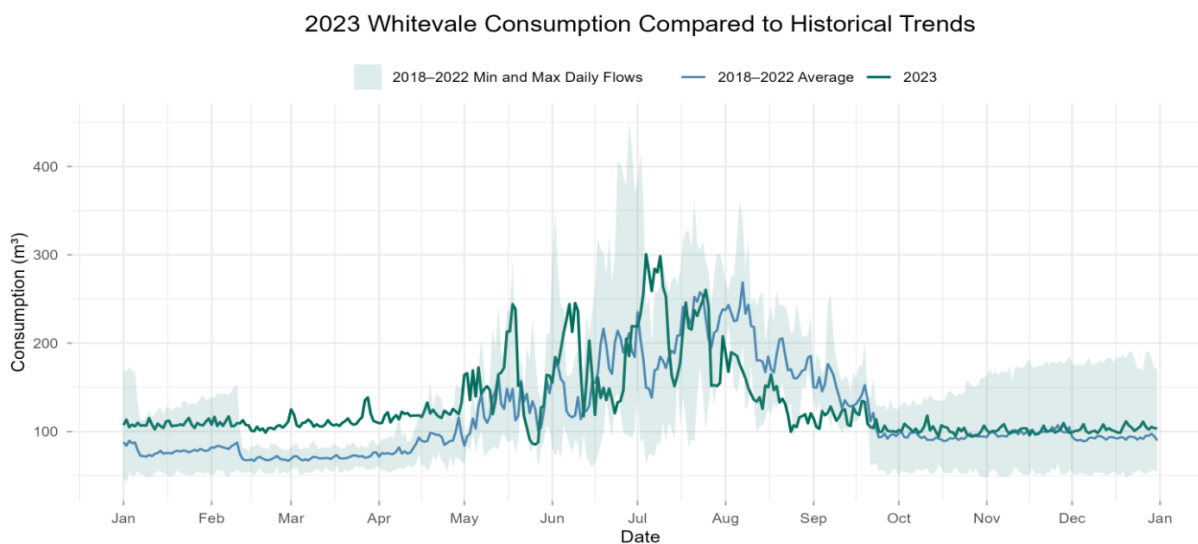


Figure 20: WVV Distribution Water Consumption in 2023

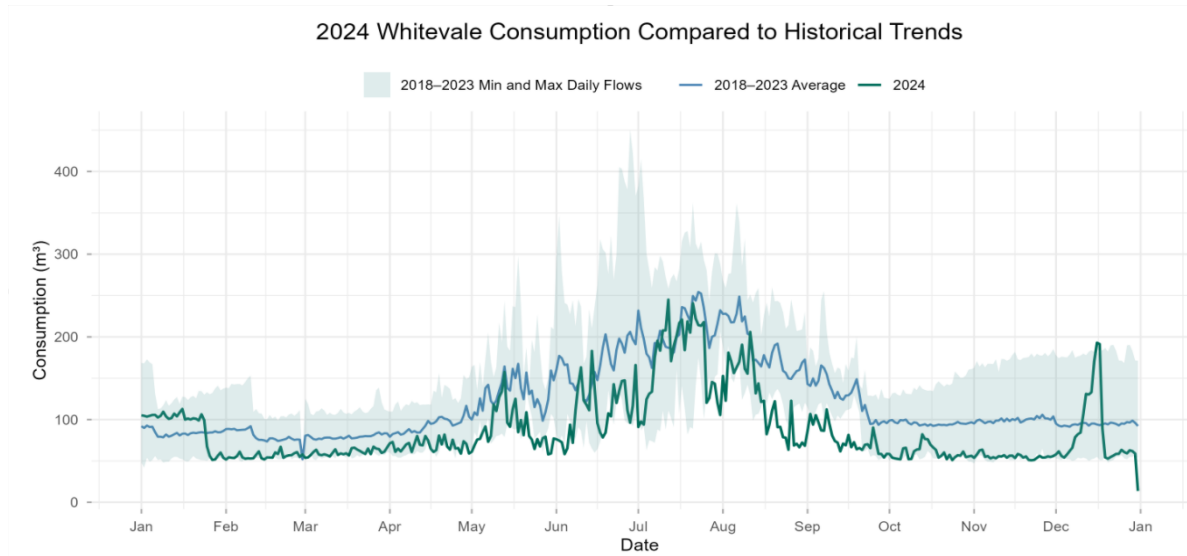


Figure 21: WVV Distribution Water Consumption in 2024

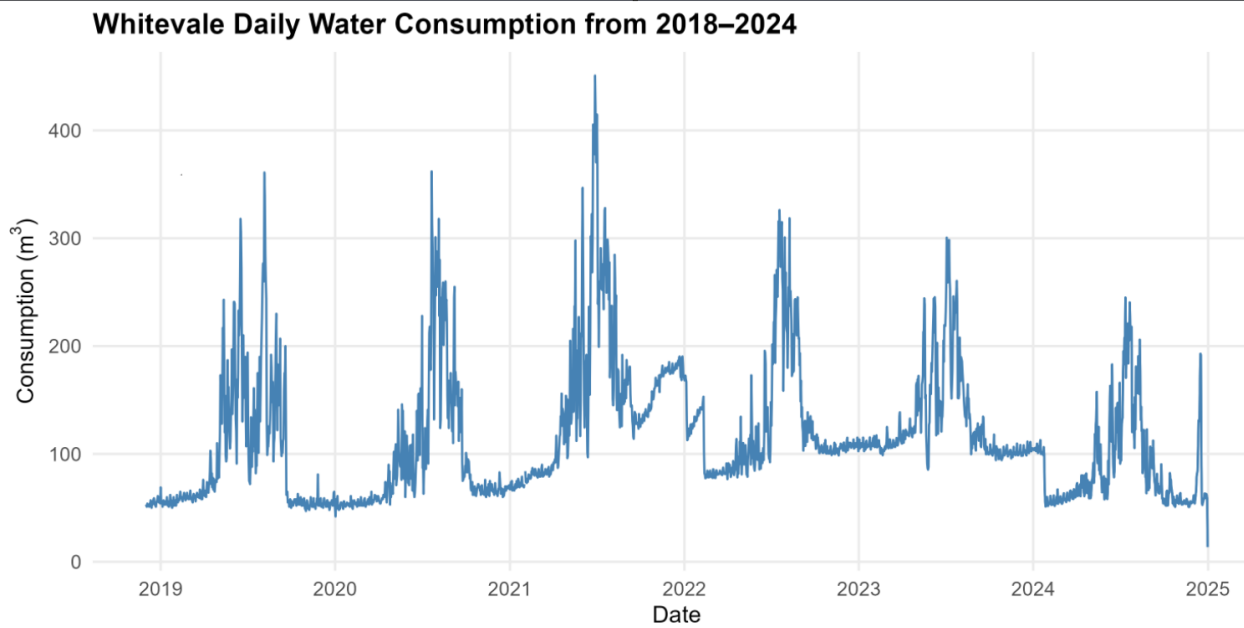


Figure 22: WVV Distribution Water Historical Consumption 2018-2024












REFERENCES

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APPENDIX A
WWW Water System Map

Legend

Sampling Sites

-  TW - Treated Water
-  RW - Raw Water
-  BU - Backup Treated Water
-  Water Service
-  Fire Hydrants
-  Air Valve
-  Blow Off
-  Water Valves
-  Water Mains
-  Parcels
-  Service Areas



This map was compiled by RDNO, using data believed to be accurate; however, a margin of error is inherent in all maps. This product is distributed without warranties of any kind, either express or implied, including but not limited to warranties of sustainability or particular purpose or use.

Whitevale Water Utility




REGIONAL DISTRICT NORTH OKANAGAN



Plot Date: Jan 12, 2022

Scale: 1:3,000



Meters

Plot Size: 11" x 8.5"

APPENDIX B
Chlorine Contact Time

Whitevale Water Contact Time Calculation

13.1 m	Reservoir - Length (intake pipe enters south end of reservoir now)
2.7 m	Reservoir - Total Height
2.5 m	Reservoir - Height (to High Water Level - 100%)
2.13	Reservoir - Height (to Low Water Level - 85%)
7.3 m	Reservoir - Width
203 m ³	Reservoir - Volume at low level
75 us.gpm	Flow from Well to Reservoir
4.7 L/s	Flow from Well to Reservoir - peak hourly
0.0 m ³	Volume in Contact Pipe
449 minutes	Theoretical Detention Time (TDT) - V/Q
0.1	Baffling Factor (no baffling, jet flow from inflow)
45 minutes	Contact Time in Reservoir (TDT X Baffling Factor)

As WWV well is sourced from a confined aquifer, the water parameters are generally consistent with little to no change in chlorine demand.

CT calculation for 1 st customer - sampling point in pump house after reservoir

	Cl ₂ Residual mg/L (free)	Cl ₂ Injection mg/L	pH raw water	Raw Water temp °C	CT (Cl ₂ X CT in res)	CT - Virus	CT _a /CT _r	% Achieved
	Min.	Min.	Average	Average	min-mg/L	Required		
Normal Operation	0.70	0.83	8.00	8.7	31.4	8.0	3.93	100.00
1 chlorine pump fails	0.35	0.415	8.00	8.7	15.7	8.0	1.96	100.00

APPENDIX C
Operating Permit



Interior Health

Health Protection


Permit To Operate

Drinking Water System 15 - 300 Connections

Facility Number: 0411221
Name of Facility: Whitevale Utilities
Address: 715 Franklyn Rd
Lumby BC V0E 2G7
Canada
Primary owner: Regional District of North Okanagan
Conditions:

April 01, 2017

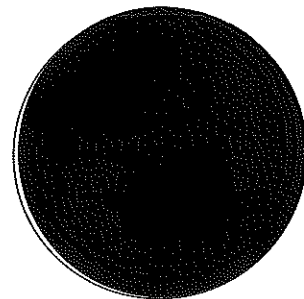
Effective Date


Environmental Health Officer

April 20, 2017

Issue Date

This permit is nontransferable and must be displayed in a conspicuous place





Interior Health

ACCOUNTS RECEIVABLE

#200, 235 Lansdowne Street, Kamloops, BC, CANADA V2C 1X8

Telephone: 1-866-314-2806 LOCAL 2780 or Direct 250-314-2780

Accountsreceivable@Interiorhealth.ca

INVOICE B-2023-48705

24-Jan-2023

RECEIVED

FEB 09 2023

Environmental Health Operating Permit Fees

Page 1 of 1

Date: Feb 10/23

REGIONAL DISTRICT OF NORTH OKANAGAN

In Account with: Whitevale Utilities WS (A2016009501) CC3 Amount

9848 Aberdeen Rd
Vernon BC V1B 2K9
Canada

012 957 521		

Payment is due within 30 days.

A validation decal(s) will be issued upon receipt of payment of this invoice.

The Health Act Fees Regulation provides that an operating permit is valid only if it bears an unexpired decal.

Name: KP

Item	Facility Number	Facility Name Item Description Signature	Operations Type	Amount
1.	0411221	Whitevale Utilities [0411221] Apr 2023 to Mar 2024 Drinking Water System 15 - 300 Connections <i>[Signature]</i>	Year Round	\$150.00

Total Due: \$150.00

Mail Payment to:

Please make cheque or money order payable to:
INTERIOR HEALTH

Mail to:
INTERIOR HEALTH
ACCOUNTS RECEIVABLE - PUBLIC HEALTH PROTECTION
#200, 235 Lansdowne Street, Kamloops, BC, CANADA V2C 1X8

NOTICE:

- Payment is due within 30 days.
- If cash payment, please pay at your local Health Unit. Do not mail cash.

PLEASE DETACH STUB BELOW AND RETURN WITH YOUR PAYMENT. KEEP TOP PORTION FOR YOUR RECORDS.



Interior Health

ACCOUNTS RECEIVABLE

#200, 235 Lansdowne Street

Kamloops, BC, CANADA V2C 1X8

INVOICE B-2023-48705

24-Jan-2023

Page 1 of 1

Environmental Health Operating Permit Fees

Indicate any changed of Owner/Facility Name/Address:

Information Below is Correct

OR Change of Owner/Facility/Name/Address:

DO NOT SUBMIT PAYMENT

9848 Aberdeen Rd
Vernon BC V1B 2K9
Canada

Call 1-855-744-6328 to advise of any changes

Total Items: 1

Routing #:4001

Account #: A2016-009501

Decals will not be issued unless the account is paid in full. Please contact HP if you are paying less than the full amount.

Payment Method: Cheque Cash Money Order Visa Mastercard

Credit Card payments should be made online at: payment.interiorhealth.ca

Card #: _____ Expiry Date: _____

Name on Card: _____ Signature: _____

Total Due: \$150.00

PLEASE DETACH THIS STUB AND RETURN WITH YOUR PAYMENT

Please check off the amount(s) being paid and write your invoice and facility number(s) on cheque or money order.



Interior Health

ACCOUNTS RECEIVABLE

200-235 Lansdowne St. Kamloops BC Canada V2C 1X8

Toll Free: 1-844-868-5200 ext. 10365 Local calls: 778-362-6810 ext. 10365

accountsreceivable@interiorhealth.ca

TO VALIDATE your operating permit, immediately affix this decal in the designated location on the permit. The Health Act Fees Regulation states that an operation permit is valid only if it bears an unexpired decal.

Regional District of North Okanagan
Whitevale Utilities
9848 Aberdeen Rd
Vernon BC V1B 2K9
Canada

Permit Number: **003398**

Issue Date: 23-Feb-2023

Expiry Date: 31-Mar-2024

Facility Number: 0411221

Facility Name: Whitevale Utiliti



Drinking Water System 15 - 300 Connections



Interior Health

ACCOUNTS RECEIVABLE

#200, 235 Lansdowne Street, Kamloops, BC, CANADA V2C 1X8

Telephone: 1-866-314-2806 LOCAL 2780 or Direct 250-314-2780

Accountsreceivable@Interiorhealth.ca

INVOICE B-2024-56653

23-Jan-2024

Environmental Health Operating Permit Fees

Page 1 of 1

In Account with: Whitevale Utilities WS (A2016-009501)

9848 Aberdeen Rd
Vernon BC V1B 2K9
Canada

Payment is due within 30 days.

A validation decal(s) will be issued upon receipt of payment of this invoice.

The Health Act Fees Regulation provides that an operating permit is valid only if it bears an unexpired decal.

Table with 5 columns: Item, Facility Number, Facility Name Item Description, Operations Type, Amount. Row 1: 1, 0411221, Whitevale Utilities [0411221] Apr 2024 to Mar 2025 Drinking Water System 15 - 300 Connections, Year Round, \$150.00

Total Due: \$150.00

Mail Payment to:

Please make cheque or money order payable to: INTERIOR HEALTH

Mail to: INTERIOR HEALTH
ACCOUNTS RECEIVABLE - PUBLIC HEALTH PROTECTION
#200, 235 Lansdowne Street, Kamloops, BC, CANADA V2C 1X8

NOTICE:

- Payment is due within 30 days.
• If cash payment, please pay at your local Health Unit.
Do not mail cash.

PLEASE DETACH STUB BELOW AND RETURN WITH YOUR PAYMENT. KEEP TOP PORTION FOR YOUR RECORDS.



Interior Health

ACCOUNTS RECEIVABLE

#200, 235 Lansdowne Street

Kamloops, BC, CANADA V2C 1X8

INVOICE B-2024-56653

23-Jan-2024

Page 1 of 1

Environmental Health Operating Permit Fees

Form with fields for: Indicate any changed of Owner/Facility Name/Address, Payment Method, Card #, Expiry Date, Name on Card, Signature, Total Items: 1, Routing #: 4001, Account #: A2016-009501, Total Due: \$150.00

Date: Mar 12/24

GL Code	CC2	CC3	Amount
012 957 521			100%

Name: KP

Signature: 



Interior Health

ACCOUNTS RECEIVABLE

12-945 Columbia St W, Kamloops, BC V2C 1L5

Toll Free: 1-844-868-5200 ext. 10365 – Local Calls: 778-362-6810 ext. 10365

Email: hp.billing@interiorhealth.ca

PERMIT VALIDATION

TO VALIDATE your operating permit, immediately affix this decal in the designated location on the permit. The Health Act Fees Regulation states that an operation permit is valid only if it bears an unexpired decal.

Regional District of North Okanagan
Whitevale Utilities
9848 Aberdeen Rd
Vernon BC V1B 2K9
Canada

Permit Number: **006182**

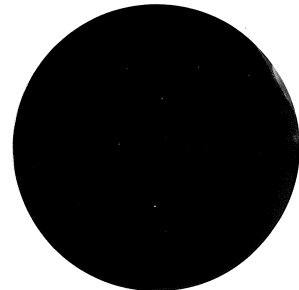
Issue Date: 19-Mar-2024

Expiry Date: 31-Mar-2025

Facility Number: 0411221

Facility Name: Whitevale Utilities

Drinking Water System 15 - 300 Connections



APPENDIX D
Sampling Program and Schedules

2023 Whitevale Water Utility Water Quality Monitoring Program

Whitevale Water Quality Monitoring Program

RDNO Operator Tasks	
Bottle Pick up	Caro bacterial bottles at DCWTP Lab
Sampling	Sampling will occur the second and fourth week of every month on Tuesday (potential exceptions due to holidays)
Chlorine	At all distribution sites use handheld meter and log data
Turbidity	At all distribution sites use handheld meter and log data
pH	At all distribution sites use handheld meter and log data
Requisition Sheets	All bacterial samples have requisition sheets for IHA
Bottle Drop off	Samples must be dropped off at the DCWTP lab fridge or cooler outside DCWTP building on Tuesday by 10:00 am. The worksheet must be with the samples. Water quality will pick up the samples and copy the worksheet. Microbiological samples must be at Caro lab within 36 hours or they cannot be processed.
Instrument cleaning and calibration	Clean and calibrate handheld meters monthly

Sample Sites		
Site Type	Sample Site Name	WaterTrax ID#
Source	Whitevale Well 2	137BA
Treatment	Whitevale Reservoir	717B
Distribution	Eastwood Road SS	25ACC
Distribution	Fraser Road SS	25ACB

Instrument Calibration	
Handheld Instruments	Cleaned and calibrated monthly by RDNO operators
Online Instruments	Calibrated on a monthly basis or as specified in the instrument manual

2023 Whitevale Water Utility Water Quality Monitoring Program

Whitevale Water Quality Sampling Schedule

Source Analysis		
Sample Sites	Frequency	Caro Lab Parameters
Whitevale Well 2	Once a month (4th week of the month)	Bacteria

Treatment Analysis		
Sample Sites	Frequency	Caro Lab Parameters
Whitevale Reservoir	Bi-weekly (2nd and 4th week of the month)	Bacteria

Distribution Analysis		
Sample Sites	Frequency	Caro Lab Parameters
Eastwood Road SS	Once a month (2nd week of the month)	Bacteria
Fraser Road SS	Once a month (4th week of the month)	Bacteria

4 Distribution Bacterial Samples Per Month

2023 Whitevale Water Utility Water Quality Monitoring Program

Whitevale Annual Comprehensive Source Sampling

Comprehensive Analysis Schedule		
Sample Site	Frequency	When
Whitevale Well 2	Annually	June
Annual sampling rotates between June and October each year		
Bottles for Annual Sampling		
1 - Caro Baterial		
1 - 125 mL metals		
1 - mercury bottle (flint)		
1 - Cyanide		
1 - 1 L Caro		

2024 Whitevale Water Utility Water Quality Monitoring Program

Whitevale Water Quality Monitoring Program

RDNO Operator Tasks	
Bottle Pick up	Caro bacterial bottles at DCWTP Lab
Sampling	Sampling will occur the second and fourth week of every month on Tuesday (potential exceptions due to holidays)
Chlorine	At all distribution sites use handheld meter and log data
Turbidity	At all distribution sites use handheld meter and log data
pH	At all distribution sites use handheld meter and log data
Requisition Sheets	All bacterial samples have requisition sheets for IHA
Bottle Drop off	Samples must be dropped off at the DCWTP lab fridge or cooler outside the DCWTP building on Tuesday by 11:00 am. The worksheet must be with the samples. Water quality will pick up the samples and copy the worksheet. Microbiological samples must be at Caro lab within 30 hours or they cannot be processed.
Instrument cleaning and calibration	Clean and calibrate handheld meters monthly

Sample Sites	
Site Type	Sample Site Name
Source	Whitevale Well 2
Treatment	Whitevale Reservoir
Distribution	Eastwood Road SS
Distribution	Fraser Road SS

Instrument Calibration	
Handheld Instruments	Cleaned and calibrated monthly by RDNO operators
Online Instruments	Calibrated on a monthly basis or as specified in the instrument manual

2024 Whitevale Water Utility Water Quality Monitoring Program

Whitevale Water Quality Sampling Schedule

Source Analysis		
Sample Sites	Frequency	Caro Lab Parameters
Whitevale Well 2	Once a month (4th week of the month)	Bacteria

Treatment Analysis		
Sample Sites	Frequency	Caro Lab Parameters
Whitevale Reservoir	Bi-weekly (2nd and 4th week of the month)	Bacteria

Distribution Analysis		
Sample Sites	Frequency	Caro Lab Parameters
Eastwood Road SS	Once a month (2nd week of the month)	Bacteria
Fraser Road SS	Once a month (4th week of the month)	Bacteria

4 Distribution Bacterial Samples Per Month

2024 Whitevale Water Utility Water Quality Monitoring Program

Whitevale Annual Comprehensive Source Sampling

Comprehensive Analysis Schedule		
Sample Site	Frequency	When
Whitevale Well 2	Annually	October
Annual sampling rotates between June and October each year		
Bottles for Annual Sampling		
1 - Caro Baterial		
1 - 125 mL metals		
1 - mercury bottle (flint)		
1 - Cyanide		
1 - 1 L Caro		

APPENDIX E
2023 / 2024 Raw Water Comprehensive Analysis

Whitevale Well 2 Water Quality 2023

Water System: Whitevale Water Utility
Source: Whitevale groundwater

Sampling Point: Whitevale Well 2
Date of Sample: August 22, 2023

Parameter	Result	Guideline	Unit
ALKALINITY (BICARBONATE, AS CaCO ₃)	117	N/A	mg/L
ALKALINITY (CARBONATE, AS CaCO ₃)	<1.0	N/A	mg/L
ALKALINITY (HYDROXIDE, AS CaCO ₃)	<1.0	N/A	mg/L
ALKALINITY (PHENOLPHTHALEIN, AS CaCO ₃)	<1.0	N/A	mg/L
ALKALINITY (TOTAL, AS CaCO ₃)	117	N/A	mg/L
ALUMINUM (TOTAL)	<0.005	OG < 0.1	mg/L
ANTIMONY (TOTAL)	<0.0002	MAC = 0.006	mg/L
ARSENIC (TOTAL)	<0.0005	MAC = 0.01	mg/L
BARIUM (TOTAL)	0.0087	MAC = 2	mg/L
BORON (TOTAL)	<0.05	MAC = 5	mg/L
CADMIUM (TOTAL)	<0.00001	MAC = 0.007	mg/L
CALCIUM (TOTAL)	40.1	N/A	mg/L
CHLORIDE	1.12	AO ≤ 250	mg/L
CHROMIUM (TOTAL)	<0.0005	MAC = 0.05	mg/L
COBALT (TOTAL)	<0.0001	N/A	mg/L
COLOUR (TRUE)	<5.0	N/A	TCU
CONDUCTIVITY	241	N/A	µS/cm
COPPER (TOTAL)	<0.0004	MAC = 2	mg/L
CYANIDE (TOTAL)	<0.002	MAC = 0.2	mg/L
FLUORIDE	<0.1	MAC = 1.5	mg/L
HARDNESS (TOTAL, AS CaCO ₃)	123	N/A	mg/L
IRON (TOTAL)	0.01	AO ≤ 0.3	mg/L
LANGELIER INDEX	0.1	N/A	-
LEAD (TOTAL)	<0.0002	MAC = 0.005	mg/L
MAGNESIUM (TOTAL)	5.58	N/A	mg/L
MANGANESE (TOTAL)	0.00147	MAC = 0.12	mg/L
MERCURY (TOTAL)	<0.00001	MAC = 0.001	mg/L
MOLYBDENUM (TOTAL)	0.00133	N/A	mg/L
NICKEL (TOTAL)	0.00044	N/A	mg/L
NITRATE	0.011	N/A	mg N/L
NITRITE	<0.01	N/A	mg N/L
PH	7.35	7.0-10.5	pH units
POTASSIUM (TOTAL)	2.12	N/A	mg/L
SELENIUM (TOTAL)	<0.0005	MAC = 0.05	mg/L
SODIUM (TOTAL)	4.32	AO ≤ 200	mg/L
STRONTIUM (TOTAL)	0.17	MAC = 7	mg/L
SULPHATE	21.9	AO ≤ 500	mg/L
TOTAL DISSOLVED SOLIDS	146	AO ≤ 500	mg/L
TURBIDITY	0.08	OG < 1	NTU
URANIUM (TOTAL)	0.000208	MAC = 0.02	mg/L
ZINC (TOTAL)	<0.004	AO ≤ 5	mg/L

"<" = Less than the detection limit shown

N/A = No current guideline

OG = Operational Guideline

MAC = Maximum Acceptable Concentration Guideline

AO = Aesthetic Objective Guideline

Whitevale Well 2 Water Quality 2024

Water System: Whitevale Water Utility
 Source: Whitevale groundwater

Sampling Point: Whitevale Well 2
 Date of Sample: October 29, 2024

Parameter	Result	Guideline	Unit
ALKALINITY (BICARBONATE, AS CaCO ₃)	101	N/A	mg/L
ALKALINITY (CARBONATE, AS CaCO ₃)	<1.0	N/A	mg/L
ALKALINITY (HYDROXIDE, AS CaCO ₃)	<1.0	N/A	mg/L
ALKALINITY (PHENOLPHTHALEIN, AS CaCO ₃)	<1.0	N/A	mg/L
ALKALINITY (TOTAL, AS CaCO ₃)	101	N/A	mg/L
ALUMINUM (TOTAL)	<0.005	OG < 0.1	mg/L
ANTIMONY (TOTAL)	<0.0002	MAC = 0.006	mg/L
ARSENIC (TOTAL)	<0.0005	MAC = 0.01	mg/L
BARIUM (TOTAL)	0.0084	MAC = 2	mg/L
BORON (TOTAL)	<0.05	MAC = 5	mg/L
CADMIUM (TOTAL)	<0.00001	MAC = 0.007	mg/L
CALCIUM (TOTAL)	38.4	N/A	mg/L
CHLORIDE	1.03	AO ≤ 250	mg/L
CHROMIUM (TOTAL)	<0.0005	MAC = 0.05	mg/L
COBALT (TOTAL)	<0.0001	N/A	mg/L
COLOUR (TRUE)	<5.0	N/A	TCU
CONDUCTIVITY	254	N/A	µS/cm
COPPER (TOTAL)	<0.0004	MAC = 2	mg/L
CYANIDE (TOTAL)	<0.002	MAC = 0.2	mg/L
FLUORIDE	<0.1	MAC = 1.5	mg/L
HARDNESS (TOTAL, AS CaCO ₃)	118	N/A	mg/L
IRON (TOTAL)	0.01	AO ≤ 0.3	mg/L
LANGELIER INDEX	-0.02	N/A	-
LEAD (TOTAL)	<0.0002	MAC = 0.005	mg/L
MAGNESIUM (TOTAL)	5.39	N/A	mg/L
MANGANESE (TOTAL)	0.00161	MAC = 0.12	mg/L
MERCURY (TOTAL)	<0.00001	MAC = 0.001	mg/L
MOLYBDENUM (TOTAL)	0.0014	N/A	mg/L
NICKEL (TOTAL)	<0.0004	N/A	mg/L
NITRATE	<0.01	N/A	mg N/L
NITRITE	<0.01	N/A	mg N/L
PH	7.94	7.0-10.5	pH units
POTASSIUM (TOTAL)	2.07	N/A	mg/L
SELENIUM (TOTAL)	<0.0005	MAC = 0.05	mg/L
SODIUM (TOTAL)	4.7	AO ≤ 200	mg/L
STRONTIUM (TOTAL)	0.166	MAC = 7	mg/L
SULPHATE	21.9	AO ≤ 500	mg/L
TOTAL DISSOLVED SOLIDS	135	AO ≤ 500	mg/L
TURBIDITY	<0.10	OG < 1	NTU
URANIUM (TOTAL)	0.00015	MAC = 0.02	mg/L
ZINC (TOTAL)	<0.004	AO ≤ 5	mg/L

"<" = Less than the detection limit shown

N/A = No current guideline

OG = Operational Guideline

MAC = Maximum Acceptable Concentration Guideline

AO = Aesthetic Objective Guideline