Mabel Lake Water Utility
2025 Annual Report



Regional District of North Okanagan
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ACRONYMS

AO	Aesthetic Objective
BPD	Backflow Prevention Device
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
DCC	Development Cost Charge
DOC	Dissolved Organic Carbon
DWO	Drinking Water Officer
DWPA	Drinking Water Protection Act
DWPR	Drinking Water Protection Regulation
DWTO	Drinking Water Treatment Objectives (Microbiological) for Surface Water Supplies
E. coli	Escherichia coli
EOCP	Environmental Operator Certification Program
ERP	Emergency Response Plan
FIP	Financial Implementation Plan
GCDWQ	Guidelines for Canadian Drinking Water Quality
HAA	Haloacetic Acids
IH	Interior Health
LPH	Lakeshore Pump House
M	Meters
MAC	Maximum Acceptable Concentration
MLW	Mabel Lake Water Utility
MWP	Master Water Plan
mm	millimeters
NTU	Nephelometric Turbidity Units
OC	Operational Certificate
Old PH	Old Pump House
OP	Operating Permit
PRV	Pressure Reducing Valve
RDNO	Regional District of North Okanagan
SCADA	Supervisory Control and Data Acquisition
SDWQG	Source Drinking Water Quality Guidelines
SRWSP	Shuswap River Watershed Sustainability Plan
SS	Sample Site
Teale’s	Teale’s Water Utility Service
THAA	Total Haloacetic Acids
THM	Trihalomethanes
TOC	Total Organic Carbon
TTHM	Total Trihalomethanes
TWL	Top Water Level
UVT	UV Transmissivity
VOC	Volatile Organic Compounds
WQA	Water Quality Advisory

2.0 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 Conditions on Permit (COP) for the Mabel Lake Water Utility (MLW).

This report provides an overview of the following for 2025:

- the water system of MLW
- the operations of the water utility, including the 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 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: https://www.rdno.ca/mlw.

3.0 WATER SYSTEM OVERVIEW

3.1. SYSTEM OVERVIEW

The eastern half of the MLW system, Mabel Ridge Estates, was constructed in the 1970s and operated as a private water utility until 2003, at which point it became a function of the RDNO. The service boundary has since expanded west with the development of the Mabel Lake Golf Course and service to the Kingfisher RV Park in 2005. Appendix A provides the water service boundary and properties serviced by MLW.

MLW currently provides potable water to 379 residential connections (311 single-family units and 68 multi-family units) and three (3) commercial connections. Most connected residents and all three (3) commercial connections are seasonally occupied, with approximately 30 connections considered to be occupied year-round.

Two (2) of the commercial connections are a campground (90 campsites, a general store, and six (6) cabins) and an RV park (70 campsites). The third commercial connection is the golf course

clubhouse, which includes a restaurant. MLW supplies potable water at the golf course clubhouse, although the Mabel Lake Golf Course uses the MLW intake to supply irrigation water for the golf course.

The Mabel Lake Water System Capacity Assessment, completed in the spring of 2025, has estimated the population during peak summer months at 3,145 persons. It should be noted that this estimate is likely not applicable to long weekends when occupancy is probably much higher. The winter population is estimated to be approximately 60 persons.

The MLW system is comprised of the following:

- A screened intake located in Mabel Lake, approximately 26 m deep, lays 235 m southeast of the Lakeshore Pumphouse (LPH). The intake pipe delivers water from the intake to a clear well beneath the LPH. The raw water is continuously monitored in the LPH for turbidity.
- Water from the clear well is pumped into a 250 mm diameter transmission main that is 526 m long. Chlorine is injected into the transmission main in the LPH to provide adequate chlorine CT within the transmission main before the first customer receives water and to provide residual chlorine in the distribution system to inhibit microbial growth.
- The mid-level reservoir located off Lusk Lake Road East, with a top water level (TWL) of 469 m, is supplied from the LPH via the distribution network.
- A pump station (booster station) at Lusk Lake Road East pumps water to the upper-level reservoir located off Walker Road, with a TWL of 518 m.
- 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.
- MLW does not provide fire protection services. The reservoirs and pipe mains are undersized for this purpose according to the Fire Underwriters Survey, and there is no backup power. Also, there are insufficient human resources to staff a volunteer fire department during the off-season.
- The reservoirs provide water by gravity during power outages; therefore, customers do not lose water supply from short-term power outages. Backup power is not feasible for MLW at this time, so residents can expect to lose water during long-term power outages.

3.2. WATER SOURCE

The water source for the MLW system is Mabel Lake. Based on the limnology characteristics, Mabel Lake is an oligotrophic lake (Bryan and Jensen, 1999). This means that Mabel Lake is clear with low nutrient levels and low algae levels (Bryan and Jensen, 1999). As indicated in

Section 2.1, the intake is about 26 m deep located in an area upstream of most cabins and the marina.

3.3. TREATMENT REQUIREMENTS

The treated water quality objectives for all BC water systems using a surface water source need to meet the Drinking Water Treatment Objectives (Microbiological) for Surface Water Supplies (DWTO) in BC, which include the following:

- 4 log removal or inactivation of viruses.
- 3 log removal or inactivation of protozoa (*Giardia* and *Cryptosporidium*).
- 2 treatment processes for surface water.
- 1 Nephelometric turbidity units (NTU) maximum turbidity.
- 0 Escherichia coli (E.coli).

Currently, MLW raw water is treated with only chlorination at the LPH. Chlorination of the water is completed to ensure sufficient contact time (CT) to provide 4 log inactivation of viruses, to meet the 0 E.coli condition, and to inhibit microbial growth in the distribution system by achieving a minimum of 0.2 mg/L free chlorine throughout the system. At the maximum flow rate with two (2) distribution pumps in operation simultaneously, the CT achieved in the transmission main is 28 minutes. This meets the minimum CT requirement for viruses of eight (8) minutes during winter conditions and six (6) minutes in summer conditions. See Appendix B for the MLW CT calculation.

MLW does not meet the 3-log inactivation / removal for protozoa, nor does it have two (2) treatment processes, and is therefore not compliant with these DWTO standards.

After the intake was deepened in 2014, the RDNO was planning on applying for a filtration exclusion by installing UV treatment to meet the 3 log inactivation / removal for protozoa and the criteria to have two (2) treatment processes; however, as outlined in Section 5.2.2, the intake has shown to be sensitive to extreme events (flooding and wildfire specifically) around the lake and the water quality is not meeting the filtration exclusion criteria. Although UV disinfection is less expensive, it will not protect the community from BWNs, and hence, filtration will be pursued.

4.0 OPERATIONS

4.1. MANAGEMENT

MLW is owned and managed by the RDNO. The Manager, Small Utilities, is responsible for the operation and management, with oversight provided by the General Manager, Utilities, and the RDNO Board of Directors. The water quality monitoring program is coordinated and monitored by

the water quality staff of the RDNO. The RDNO employs an EOCP certified contract operator to complete day-to-day operation and maintenance tasks. The operator is also required to respond to emergencies, 24 hours a day, seven (7) days a week, and have a backup operator available to respond if necessary.

Interior Health (IH) is the regulator of water utilities and is responsible for ensuring compliance with legislation and provincial standards. IH also issues the Operating Permit (OP) (Appendix C) and conditions on permit (COP) (Appendix D). The IH representative is a Drinking Water Officer (DWO) who works closely with the water utility to ensure the COP are met. In November 2021, Mabel Lake Water Utility was reclassified as a Large Water Utility.

4.2. EOCP CLASSIFICATION

MLW is classified by the EOCP as a Water Treatment Facility Level II (WT-II) (EOCP #2270), and a Water Distribution Facility Level I (WD-I) (EOCP #1596).

The MLW operations is contracted to Aberdeen Electric Ltd., see Table 1 for the list of operators certified through the EOCP. The contracted operator is responsible for operating and maintaining the source, treatment, and distribution system, as well as sampling, as outlined by the water quality monitoring program.

The operator duties include on-site checks of the facilities at least three (3) times per week, with continual monitoring by the SCADA system with set alarms. The operators are also required to check the system via SCADA at least once per day. 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.

4.3. OPERATIONS PROGRAMS

4.3.1. FLUSHING AND STANDPIPE MAINTENANCE

Standpipe flushing and maintenance is completed by the contract operators twice a year. Records of the standpipe maintenance are kept on file. At RDNO water utilities with Fire Protection services, local fire departments are responsible for the costs of hydrant maintenance. As MLW is not in a fire protection area, standpipe maintenance has been paid for by water users through the MLW annual repairs and maintenance budget.

MLW had been replacing two (2) old hydrants or non-draining standpipes per year with self-draining standpipes when the budget allowed. Old hydrants are being replaced as they are oversized for the water system and could cause damage to the water system if used. As of 2025 and into the future, only one (1) standpipe a year will be replaced due to an increase in cost. Seven (7) hydrants / standpipes have been replaced with two (2) hydrants still to be replaced.

There is one (1) dead-end on the water system and a standpipe is installed at 3303 Enderby Mabel Lake Road SS. It is set up to continually run at a low flow during the low-flow season (September to May) to maintain chlorine residuals within the distribution system.

4.3.2. CROSS CONNECTION CONTROL PROGRAM

The RDNO has a Cross Connection Control Program (CCCP) for all water utilities owned by the RDNO, including MLW. 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, most connections in the Kingfisher community are residential and pose a minor hazard to MLW. The limited number of commercial and multi-tenant properties will be assessed to identify their hazard levels and appropriate backflow prevention requirements in the upcoming years.

The CCCP tracked five (5) properties in 2025 that have a backflow device that requires annual testing. There were no CCCP inspections done in MLW in 2025.

Beginning in 2024, with the initiation of metering at property line, non-testable dual check valves are being installed in conjunction with the meter to provide premise isolation at low-risk properties. 43 properties had premise isolation installed since 2024.

5.0 SOURCE ASSESSMENT AND WATERSHED PROTECTION PLANNING

Most of the watershed directly contributing to Mabel Lake is crown land with primarily forestry activities, with some localized areas with cabins and two (2) campgrounds (one (1) provincial and one (1) recreational site). This does not include the Shuswap River upstream of Mabel Lake, which encompasses a very large area with two (2) communities, rural subdivisions and large agricultural properties. Due to the large contribution size of the watershed upstream of the community of Kingfisher and the small size of the water utility, aspects of source protection for this utility have been identified in the Shuswap River Watershed Sustainability Plan (SRWSP). The SRWSP was completed by the RDNO Planning department and endorsed by the RDNO Board in 2014. It can be found at the following link: Shuswap River Watershed Sustainability Plan

The purpose of the SRWSP is to create a common long-term vision for the management of the Shuswap River watershed, and a comprehensive plan for decision making with regard to land and water planning within the watershed. Another purpose is to develop a sense of responsibility for the watershed within the community. The SRWSP develops objectives for Land Use Planning / Urban / Residential Development, Agricultural Management Practices, Forestry Management Practices, Industrial and Commercial Operations, Water Quantity, and outlines strategies pertaining to each.

The goal for water quality and quantity is “to preserve and protect the Shuswap River Watershed to ensure water quality and quantity that supports the ecosystems and communities that rely on it.”

To further understand the source water for MLW, the Shuswap Watershed Council has released a summary report covering the results of recent water quality monitoring in the Shuswap watershed. The 2023-2024 combined report can be found at the following link: Shuswap Watershed Council - Water Quality Report

The RDNO retained Aquatic Consulting Ltd. (Larratt) in 2020 to complete a Source Water Assessment (SWA) for the MLW source water. The study included determining the Intake Protection Zone (IPZ) for the MLW intake (Appendix E). The IPZ included the area where water could travel to the intake within two (2) hours based on currents as well as a greater area of influence where known risks could influence the intake.

This study found four (4) high-risk areas within the IPZ, including the boat launch, Lusk Creek, flooding of the shoreline, shoreline septic, and the marina and boating. Education of the effects of boating and on the storage of chemicals and other harmful substances in flood-prone areas within the IPZ was recommended as potential mitigation measures.

In 2023, the RDNO met with the new owner of the Mabel Lake Holiday Resort (MLHR) to discuss their operations and review risks within the IPZ, as the lakeside cabins, the marine and boat launch are part of the MLHR. Based on the meeting, the following risk mitigation actions were provided or agreed upon:

- The MLHR installed a full concrete containment area for their gasoline storage tank on the beach and installed double-walled piping from the fueling station on the dock to the storage tank, greatly reducing spill risks
- They would provide full fueling service (as opposed to self-serve) and install a spring-loaded nozzle to minimize spill risks (the MLHR and RDNO both agreed that not providing fueling services on the dock would increase the risk of spills from boat owners fueling up from jerry cans)
- The cabins are on RDNO sewer
- The MLHR would be cognisant of any risks from their operations and would notify the RDNO if they identified an issue.

The RDNO plans to do further education of the risks to the intake through a bill insert in the future.

6.0 WATER QUALITY MONITORING

The goal of the MLW water quality program 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. As issues are found, operations and staff can respond to correct any issues or appropriately notify customers as required.

On September 30, 2024, the RDNO laboratory was accredited by the Enhanced Water Quality Assurance program (EWQA), becoming recognized as an accredited microbiology laboratory, allowing for microbiological analysis at the RDNO laboratory.

6.1. PROGRAM AND SCHEDULE

Water quality monitoring for MLW 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 *Source Drinking Water Quality Guidelines* (SDWQG) (MoE, 2017).

The MLW Water Quality Monitoring Program is reviewed and updated annually in January. The updated sampling program and schedules for 2025 are provided in Appendix G. The RDNO provides an updated Water Quality Monitoring Plan (WQ Plan) to IH at the beginning of each year after the program is developed. Included in the WQ Plan submitted is the monitoring schedule, parameters, and frequency of samples taken at different times of the year.

To meet Schedule B in the DWPR for populations less than 5,000, a minimum of four (4) microbiological samples are required per month. In 2025, MLW met this requirement by taking 1 (one) sample weekly during the low season and taking two (2) samples weekly during the high season.

In 2017, IH directed the RDNO to take two (2) samples weekly in the distribution from mid-May to mid-September to increase the sampling frequency during the peak season with the highest population. 3525 Enderby Mabel Lake Road SS was taken weekly, while the four (4) remaining sites were rotated each week to complete this request.

During freshet (May, June, and July), Total Organic Carbon (TOC) samples are taken weekly on the raw water. The remainder of the year, the raw water is sampled monthly for TOC. Bacterial and UV Transmissivity (UVT) are sampled weekly on the raw water (Appendix G).

The contracted operator collects bacterial samples and delivers them to the RDNO, where RDNO staff process the bacterial samples at the RDNO laboratory. RDNO staff sends results to IH and uploads results to ENKI, a third-party online database the RDNO uses to store lab data.

6.2. SOURCE

This section outlines the bacterial, turbidity, UVT, TOC, pH, temperature, and annual chemical results for 2025 raw water at MLW.

6.2.1. BACTERIA

At least one (1) weekly raw water sample is collected for E.coli and Total Coliforms from the intake and is measured using the MPN/100 mL method to reduce potential errors due to background colonies forming. Due to a dilution error, one (1) sample was a reported non-detect at a 10x dilution, giving a result of <10 MPN/100mL. Because of the extensive sampling at the intake, it was decided not to include the <10 MPN/100mL in any of the statistics and graphs.

E. coli and Total Coliforms are monitored as indicator bacteria to assess changes in source water. The DWTO indicates that Total Coliform should not exceed 100 MPN / 100 mL and E. coli should not exceed 20 MPN / 100 mL in at least 90% of the weekly samples from the previous six (6) months. Although the RDNO does not plan to pursue filtration exclusion, the RDNO uses the filtration exclusion criteria as a standard to measure the current water quality and monitor for changes that may indicate that the water quality is degrading to an unacceptable level.

MLW saw an increase in Total Coliforms in the raw water from September 23 to October 28, with three (3) results above the 100 MPN/100mL threshold, representing 5.6% of the weekly samples from the past six (6) months. All other results were below 100 MPN/100mL and were within normal historical values (Figure 1 and Figure 2). It is unknown what caused the Total Coliforms to increase during this period, and this will be monitored in the future to see if it is a trend. There were no instances where E.coli was above the 20 MPN/100mL threshold in 2025.

6.2.2. 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, plankton, and other microscopic organisms. Excessively high turbidity can have a negative effect on disinfection techniques. A provincial guidance document issued in April 2013, “The Decision Tree for Responding to a Turbidity Event in Unfiltered Drinking Water” (BC Ministry of Health, 2013) assists the RDNO during turbidity events and communication with the customers.

Turbidity at Mabel Lake intake has historically been below 1 NTU during most of the year, except during freshet. During freshet, if turbidity is > 1 NTU, the utility issues a Water Quality Advisory (WQA). If the turbidity increases above 5 NTU, a boil water notice (BWN) is issued. To mitigate freshet turbidity events, the water intake at Mabel Lake was relocated to a greater depth of 26 meters in spring 2014, and the intake is located approximately two (2) meters above the lake bottom. The previous depth was 12 meters, and the intake was located on the lake bottom. The

utility was able to avoid WQAs and BWNs during freshet from 2014 to 2016 after the intake improvement project.

Since then, several events have impacted the intake water quality and WQA's and a BWN have been required. This includes flooding in 2017 and 2018 and a wildfire on the east side of the lake that impacted water quality in 2022 and 2023. Due to the sensitivity of the intake to extreme weather conditions and other external events, the RDNO realized that filtration should be pursued as opposed to installing just UV treatment, as this would not avoid BWNs during freshet. In addition, blue-green algae is becoming more of a serious drinking water issue worldwide as it produces toxins and requires clarification and filtration to remove algae cells. Although not currently present in Mabel Lake, increasing presence is being found in many other lakes in the Okanagan.

The daily turbidity averages recorded by the SCADA system for the source water in 2025 consistently remained below 1 NTU, with the exceptions of 2.41 NTU on April 12 and 1.06 NTU on May 24. Both events showed turbidity returning to normal the following days and were well below the 5 NTU required to maintain the Filtration Exclusion standards for surface water (Figure 3). Compared to historical online data readings since 2017, 2025 exhibited low turbidity levels similar to the 2014-2016, 2019, and 2024 readings, likely due to some recovery of adjacent watersheds that experienced wildfire in 2022 and a low freshet year (Figure 4).

6.2.3. UV TRANSMISSIVITY

RDNO water quality staff monitor UV Transmissivity (UVT) throughout the year. See Appendix G for the UVT schedule. UVT represents the percent of light transmitted through the water. Current UV treatment technologies are validated to be effective down to a minimum UVT measurement of 70%; hence, UVT measurements provide an indication if UV is an acceptable treatment method for this source water.

The lowest UVT in 2025 was 88.7% on June 10, which is above the minimum UVT requirement. When observing historic UVT since 2014, no trend was evident, although it appears that low UV values have coincided with years that have major environmental events (ex. flooding (2017 and 2018) and after 2021 wildfire event (2022 and 2023)) (Figure 5).

The UVT was plotted graphically with turbidity (Figure 6) to assess if there was a direct relationship between turbidity and UVT. 2025 had a minor turbidity increase during freshet and remained well under 1 NTU for the vast majority of the year. When looking at the data, there appears to be a very weak correlation where we see the UVT decrease as turbidity increases following a lag period, as the majority of the low UVT results tend to occur during the higher turbidity periods; however, turbidity levels remained consistently low at the MLW intake this year, so a high turbidity comparison could not be completed.

6.2.4. TOTAL ORGANIC CARBON

Dissolved Organic Carbon (DOC) and TOC are a measure of dissolved and suspended carbon bound in organic molecules and organisms. These are important parameters as they are precursors for disinfection by-products (this is discussed further in Section 5.4.5 Disinfection By-Products (DBP)). The SDWQG Maximum Acceptable Concentration (MAC) for TOC is 4.0 mg/L. There are no current health standards / guidelines for DOC, but the RDNO monitors this to assess if there are changes which may impact DBPs.

TOC is measured monthly in the low season (October 1 – April 30), then monitored weekly in the high season (May 1 – September 30) (Figure 7). In 2025, there were no TOC's results for the following dates: February, week 1 of June, week 3 of July, weeks 2 and 4 of August, and December. One (1) additional sample was taken in each of April and October. Both the August week 4 and September week 2 samples had suspected preservative contamination identified by the laboratory prior to running the sample. The RDNO requested the sample not be run, but in the case of the September sample, it was run and the results provided to the RDNO. The results were in line with historical results and were therefore included in all analysis. Historic trending for MLW raw water shows that TOC has been below the SDWQG MAC of 4.0 mg/L standards since 2014 (Figure 8), with periodic increases occurring in late August to early September.

DOC has been monitored annually; however, it has been determined that it has no useful monitoring purpose as TOC is below standards and provides an indication of changes. If in the future, TOC is consistently above standards, monitoring for DOC will be reinitiated to assist in determining the higher TOC source for future treatment.

6.2.5. ALGAE DENSITY

Algae density sampling was started on the raw water on February 1, 2022, and will continue at a frequency of at least once per month. This sampling is being completed to monitor raw water quality and develop a historical database to track changes in raw water quality.

6.2.6. 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. There were six (6) instances in 2025 where pH was 6.9 and one (1) instance where pH was 6.8. All other results were between 7.0 and 7.7, falling within guidelines (Table 2).

6.2.7. ANNUAL COMPREHENSIVE

Comprehensive sampling is completed annually. The annual sampling is rotated between spring and fall to ensure the source water meets water quality guidelines during different times of the

year. The 2025 comprehensive sample was taken in October. All parameters were well within the GCDWQ limits (Appendix H).

6.3. TREATMENT PROCESS

MLW is sourced from surface water, and some variability can occur within water quality parameters throughout the year. Treatment at MLW is outlined in Section 2.3 that also describes future treatment requirements.

6.3.1. CHLORINE

Under normal operations, the target residual after chlorine injection is between 1.50 to 2.00 mg/L to achieve the minimum target chlorine residual of 0.20 mg/L at the end of the distribution system. The amount of chlorine added to achieve these targets will vary depending on water conditions such as turbidity.

Continuous online chlorine monitoring is completed with an analyzer that monitors the free chlorine just past the injection point in the LPH. There is a sample line delivering treated water to the chlorine analyzer approximately 5 m after the chlorine injection point off the transmission main. In the event of a low-level chlorine alarm, the system is programmed through SCADA to shut off the lake pumps automatically to ensure that raw water is not pumped into the distribution system and to notify the operator via an alarm.

See the monthly reports in Appendix H for the monthly SCADA free chlorine data.

6.4. DISTRIBUTION

Distribution sampling follows the specifications outlined in the COP and as directed by IH, see Sections 3.1 and 3.3. Additional parameters and monitoring can occur for individual projects. See Appendix G for the detailed schedule.

6.4.1. 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 2025, there were 74 samples analyzed using the CFU/100mL method and all samples were non-detect for E.coli in the MLW distribution system.

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

   In 2025, there were 74 samples analyzed using the CFU/100mL method. One (1) samples had 1 MPN/100mL. That site was immediately resampled and the results were <1

MPN/100mL. All remaining samples were non-detect for Total Coliform in the MLW distribution system, meeting the 90% threshold outlined in the DWPR.

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

   In 2025, no samples had more than 10 Total Coliform.

See monthly reports (Appendix I) for more information.

6.4.2. TURBIDITY

Turbidity is monitored with a handheld turbidity meter at four (4) distribution sites. Operators record the residual readings and field parameters on an electronic operator log sheet, which is backed up to the RDNO system by water quality staff monthly. Field parameters are recorded on requisition sheets and entered in ENKI, the RDNO database.

There were 490 turbidity tests of the distribution sites in 2025, and all were in compliance at <1 NTU (Table 3). See monthly reports (Appendix H) for more information.

6.4.3. CHLORINE

Total and free chlorine is monitored with a handheld chlorine meter concurrently with the turbidity readings. There were 490 samples for free chlorine and 489 samples for total chlorine, with all results greater than the operational target of 0.2 mg/L (Table 3). See monthly reports (Appendix H) for more information.

6.4.4. FIELD PARAMETERS

78 samples across all distribution sites were sampled for pH and temperature (Table 3). There were six (6) instances in 2025 where pH was below the 7.0 GCDWQ guideline. This guideline is in place to prevent erosion and leaching of pipes as well as to ensure effective treatment. All bacteria samples associated with low pH were non-detectable, so no bacterial health impact was observed. There is no guideline for temperature in the distribution system.

6.4.5. DISINFECTION BY-PRODUCTS

Trihalomethanes (THMs) are disinfection by-products formed when organic compounds naturally present in the source water react with chlorine. The level of THMs in treated water depends on numerous factors, including TOC, temperature, pH, water age, and chlorine dose. 10 distinct THM compounds are possible, but only four (4) occur to any significant degree in treated drinking water:

- Chloroform
- Bromodichloromethane
- Dibromochloromethane

- Bromoform.

Collectively, the above THM compounds are referred to as total trihalomethanes (TTHMs). Further in this text, TTHMs will refer to sample site averages of all four (4) compounds, not the individual parameters. Figures 9 and 10 are reported as an average of all four (4) compounds; therefore, TTHMs.

The GCDWQ MAC for TTHMs is 0.1 mg/L and is based on a locational running annual average of a minimum of quarterly samples taken at the point in the distribution system with the highest potential THM levels, which is 3303 Enderby Mabel Lake Road SS. Figure 9 provides the TTHM results for 2025, which were well below the GCDWQ guideline MAC of 0.10 mg/L.

Figure 10 shows the TTHM annual average from 2010 to 2025. It should be noted that the points on the graph represent two (2) distinct timeframes with different sampling plans:

- From 2010 to 2017, two (2) samples a year were collected from two (2) locations: (1) the Old PH (to represent the first customer) and (2) Kingfisher (longest retention time). The results on the graph are the average of these four (4) samples.
- In 2018, the Old PH site was eliminated due to system changes and from this time forward, it was decided to only sample Kingfisher quarterly as it represented the longest retention time. This would comply with the GCDWQ as it requires a minimum of quarterly samples at the point where the distribution system has the highest potential THM levels, (Health Canada, 2017). The results on the graph are the average of these four (4) samples. In 2023, the Kingfisher site was renamed 3303 Enderby Mabel Lake Road and sampling continued under this new name.

Figure 10 demonstrates that the TTHMs have been consistently below the MAC since 2010. This is likely due to the source water having little to no measurable colour and low TOC levels.

TTHM results at the end of the system from 2018 to 2025 have remained below the guideline of 100 µg/L, consistently between roughly 40-50 µg/L, with the exception of 2021, where the average was 58 µg/L. 2025 showed the lowest average THM readings since 2015.

Haloacetic acids (HAAs) are disinfection by-products formed when organic compounds naturally present in the source water react with chlorine. The level of HAAs in treated water depends on numerous factors, including bromide, temperature, pH, water age, and chlorine dose (Health Canada, 2017). Several distinct HAA compounds are possible, but only five (5) occur to any significant degree in treated drinking water.

- Monochloroacetic acid

- Monobromoacetic acid
- Dichloroacetic acid
- Trichloroacetic acid
- Dibromoacetic acid.

Collectively, the above HAA compounds are referred to as total haloacetic acids (THAAs), and sample results and averages are of all five (5) compounds, not the individual parameters. THAA's in 2025 were below guidelines (Figure 11).

THAA sampling has been completed quarterly since 2018 at the Kingfisher site. Figure 12 provides the THAA yearly averages, which remain stable with the exception of 2020, where a noticeable increase occurred and seems to correlate to a spike in TOC in 2020 (Figure 8). Kingfisher was renamed 3303 Enderby Mabel Lake Road in 2023 and follows the same sampling schedule as TTHMs.

7.0 WATER CONSUMPTION

Table 4 provides the monthly consumption for MLW in 2025, while Figure 13 provides a graph of the daily consumption for 2025, previous years' minimum and maximum flow rates, and daily average from 2018-2025. Figure 14 illustrates daily water consumption trend data from 2018 to 2025.

The typical water consumption trend for MLW shows low winter water use, with a significant increase starting in May. Peak flows are usually observed in July and August, while September marks the beginning of a continuous decrease in monthly flows (Figure 13-14). Water consumption is highly dependent on weather and seasonal visitors. 2025 data shows that monthly water consumption from January to May was similar to historical averages before dropping to below average usage through the summer from May to September. Winter usage from October to December 2025 was higher than historical averages, with many daily consumption values similar to the historical maximums in that timeframe.

In 2025, there was a total volume of 87,902 m^3 drawn from Mabel Lake and delivered to the distribution system for the purpose of water works, Conditional Water Licence number C110885 issued for the Mabel Lake Water Utility allows 290,300 m^3 (76,689,147 U.S. gallons) per year.

The population on Mabel Lake varies greatly depending on time of year due to it being a summer resort-based area. Based on the consumption provided in Table 4, the 2025 daily average water use can be calculated based on 369 residential connections with an average of three (3) persons per house, with only 20 of those connections considered to be year-round. These 20 year-round

connections are a best guess estimate based on the information the RDNO could gather from the area.

- Peak water use in July and August was only 339 L/d/p due to the increased population expected at Mabel Lake during the summer. For reference, Greater Vernon Water's average summer residential water use was 375 L/d/p in 2024. It should be noted that about 35% of the summer connections are associated with the campground, which would require minimal outdoor water use.
- The average annual water use in 2025 was 218 L/d/p, which is considered average when compared to the Canadian average water use of 223 L/d/p and the British Columbia average water use of 286 L/p/d (Government of Canada, 2021).

The water use for Mabel Lake is average when compared to other metered water utilities; however, the estimated winter water usage for year-round residents remains extremely high. This utility is working towards universal metering. Some properties have meters that are being read periodically; all new developments must install a meter and the RDNO is applying for grants to install meters at all other properties.

8.0 EMERGENCY RESPONSE PLANNING

8.1. THE ERP

A comprehensive update of the MLW Emergency Response Plan (ERP) was completed in 2024, and a review is completed annually. Sampling methodology and RDNO small utility ERP training for the operators also occurs annually.

RDNO Utilities staff, as well as the operators, are all instructed on how to use the following supporting documents in times of water quality changes or emergencies:

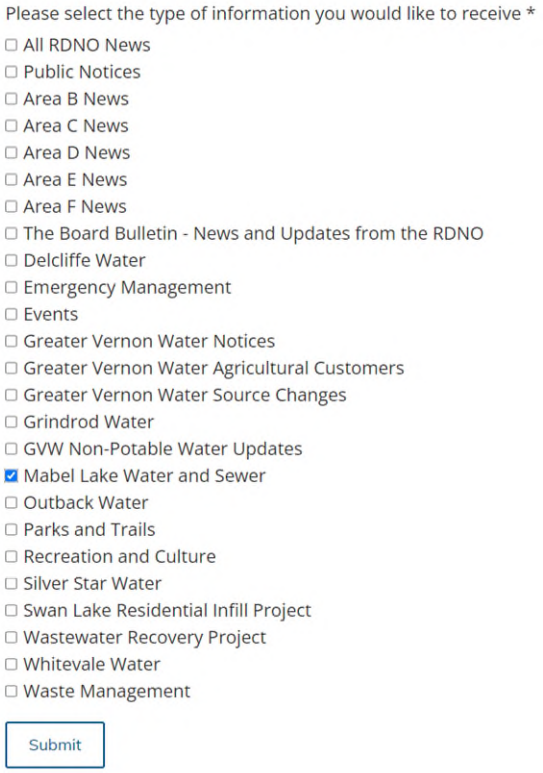
1. MLW Emergency Response Plan
2. MLW Water Quality Deviation Response Plan

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

MLW must inform customers when their drinking water does not meet standards, with the appropriate notifications based on risk. A WQA is released when the water poses a modest health risk. A BWN is released when there is a known or higher risk of a possible health impact to the customer.

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 Mabel Lake Water Mailing List by going to www.rdno.ca/subscribe and subscribing to Mabel Lake Water and Sewer email updates (shown below).



8.2. INCIDENT TRACKING AND NOTIFICATION

Two (2) incidents were recorded for 2025 and required public notification. Summaries of these are provided in Table 5.

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

There was one (1) water quality notice for water main breaks in 2025. Additional notices involved outdoor watering restrictions and water infrastructure work.

9.0 REPORTING REQUIREMENTS

Monthly and annual reports are submitted to IH as per the COP and are available to the public on the RDNO website. Monthly reports for the last 12 months are available on the website. If historical reports are wanted, please contact the RDNO at 250-550-3700.

10.0 WORKS COMPLETED IN 2025

- Preliminary Design of Lakeshore PS Upgrades – Water system capacity has become a concern in recent years. The RDNO's grant application to the Rural Economic Diversification and Infrastructure Program – Economic Diversification (REDIP-ED) included a design for upgrades to increase capacity at the Lakeshore PS. This design was completed and a cost estimate for the required upgrades was provided.
- Standpipe Replacement – An old-style standpipe was replaced with a new self-draining standpipe, which is available for use year-round compared to the old style that has to be turned on in the spring and turned off in the fall to prevent freezing.
- Universal Metering – A Growing Communities Grant was received to begin universal metering at the property line at MLW for current customers. This project began in 2025 with 37 water meter and ERT installs. All new development without a meter must install their meter at the time of connection, development or issuance of a building permit.

11.0 PLANNED WORKS

11.1. 2026 WORK PLANS

Works planned for 2026 include:

- Universal Metering – A Growing Communities Grant was received to begin universal metering at the property line at MLW for current customers. This project will continue through 2026 and will take several years to complete. The grant will fund about half of the required meters; installation will concentrate on older areas where there have been numerous leaks and in areas where an archaeology permit was required, as there is a time limit for the permit.
- Hydrant Replacement – Replace an old hydrant that cannot be used with a self-draining new standpipe so it is available for use year-round.
- Add Mid Reservoir Safety Railings – To address safety concerns regarding the edge of the Mid Reservoir.
- Communications Upgrade – Improve communications so operations can have better access to water and sewer system remotely to reduce the cost of callouts to site.
- Water Treatment Land Purchase – Purchase land for future water filtration plant location.

11.2. LONG-TERM PLANS

The current disinfection process at MLW is only treated with chlorine. As outlined in Section 2.3, filtration is being proposed due to poor raw water quality during freshet in recent years. With the

existing water system, a 3-log inactivation of Giardia and Cryptosporidium is not possible with chlorination alone.

The RDNO was planning to apply for filtration exclusion and install UV disinfection in order to meet provincial standards, based on the Mabel Lake Water System Engineering Assessment (EA) completed by WSP on February 28, 2020.

After the EA was completed, a large wildfire occurred across the lake from MLW in the summer of 2021. In 2022 and 2023, MLW experienced unusually high turbidity for an extended period during freshet and into the summer. Based on similar occurrences at other water utilities that have had a large wildfire in their watershed, it is assumed that the results of the 2021 wildfire impacted the raw water quality for the following two (2) years.

It became evident after the significant flooding in 2017 and 2018, and the wildfire in 2021, that the intake is sensitive to impacts in the watershed and the water quality can be impacted for several years after an event. Water quality sampling over the past five (5) years indicates the MLW source water will be challenged to consistently achieve turbidity guidelines for filtration exemption. For these reasons, the RDNO has determined the best course of action is to work towards filtration for MLW. Filtration would be able to treat the drinking water during these turbidity events and provide consistently safe and compliant water. In addition, Cyanobacteria, which produces neurotoxins and other toxins harmful to humans, is becoming a more common occurrence in the Okanagan and worldwide. Filtration with clarification will be required to ensure that MLW can continue to provide water to the community if Cyanobacteria blooms occur in the future.

The RDNO has determined the best course of action is to work towards filtration for MLW. Filtration will provide a more robust treatment system to provide safe drinking water for the community in the future.

The community of Kingfisher has undergone significant development in the last few years, aggravating supply challenges that MLW had already been experiencing. It was clear that future development with the current infrastructure and demands was unsustainable. In addition, MLW was identified as a large utility in 2020, shortening the timeframe to implement water treatment.

In response, the RDNO applied for and received an REDIP-ED grant. Carollo Engineers Canada, Ltd. (Carollo) was retained to complete a capacity assessment for Mabel Lake Water (MLW). The goal of this assessment was to identify any existing deficiencies that could limit growth, develop an infrastructure plan to ensure compliance with regulations into the future, including a conceptual design for a water treatment plant with filtration and a Class D cost estimate for planning purposes.

The capacity study was completed in January 2025 and is available at: Mabel Lake Water System Capacity Assessment Jan 2025.

12.0 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 MLW. The RDNO will continue to move forward on implementation of system improvements within the constraints of the MLW budget and through applications for grant funding.

TABLES

Table 1: Contracted Operators

Contracted Operators			
Last Name	First Name	Certification #	Certification Held
McKim	Warren	1336	WDIII, WTII, WWCI, WWTII
McKim	Nicholas	9341	WDI, WTII

Table 2: Raw Water Field Parameters

2025 Raw Water Field Parameters				
	Min	Max	Average	Count
pH	6.8	7.7	7.2	53
Temperature (C)	4.4	16.1	10.7	53

Table 3: Distribution Field Parameters Stats

2025 Distribution Field Sampling Chemistry Summary						
	Min	Max	Average	# Samples	Chlorine <0.2 mg/L Turbidity >1 NTU but <5 NTU	Turbidity >5 NTU
Free Chlorine (mg/L)[1]	0.27	1.62	0.91	490	---	---
Total Chlorine (mg/L)	0.31	1.71	0.99	489	---	---
Turbidity (NTU)[1]	0.09	0.87	0.38	490	---	---

2025 Distribution Field Sampling Chemistry Summary						
	Min	Max	Average	# Samples	Chlorine <0.2 mg/L Turbidity >1 NTU but <5 NTU	Turbidity >5 NTU
pH	6.9	7.7	7.2	78	---	---
Temperature	7.8	22.4	14.1	78	---	---

[1]WQ Deviation Response Plan triggered when Free Chlorine <0.20 mg/L; Turbidity > 1.0 NTU

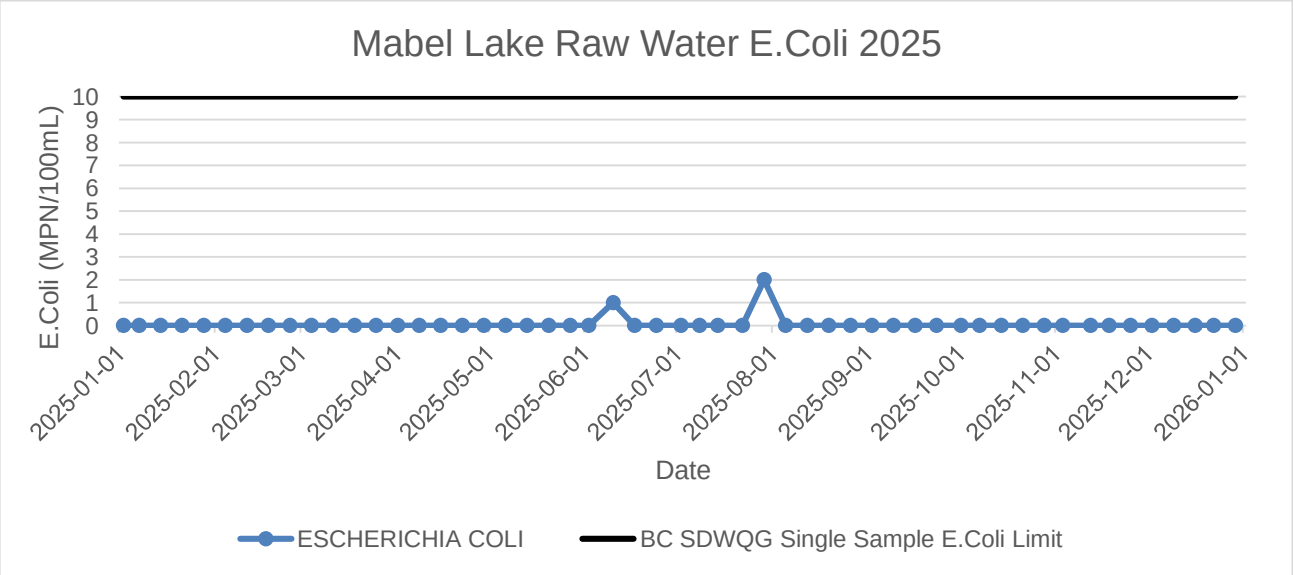
Table 4: Monthly Consumption Data

2025 Customer Consumption		
Month	Average Daily Consumption (m^3)	Total Monthly Consumption (m^3)
January	114	3,547
February	126	3,520
March	108	3,338
April	165	4,936
May	254	7,860
June	401	12,027
July	484	14,996
August	437	13,557
September	337	10,121
October	179	5,556
November	141	4,225
December	136	4,218
Annual Min	**108**	**-**
Annual Max	**484**	**-**
Annual Average	**240**	**-**
Annual Total (m^3)		87,902

Table 5: Incident Summary

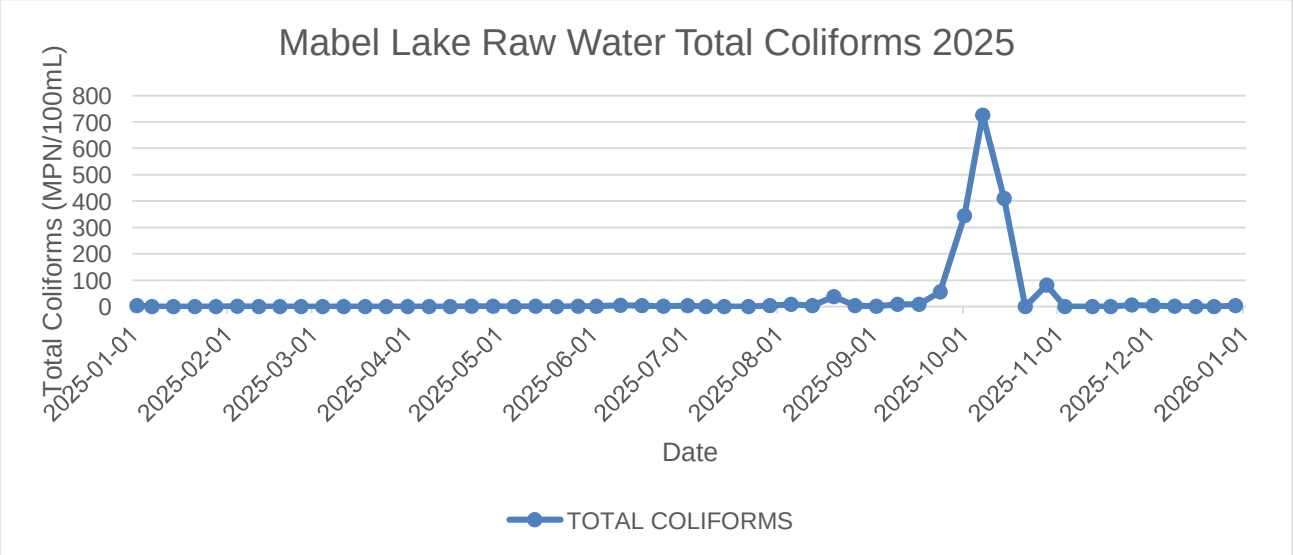
MLW: 2025 Incidents			
Cause	Date Reported	Trigger Event	Actions Completed
Water Main Leak	06-Feb-25	Leaking Water	Customers were issued a service interruption notice and placed on a BWN while the repair was completed.
Standpipe Leaking	06-Jun-25	Standpipe Leaking	Operator tried to repair the hydrant on June 26 but additional work was required. Residents were placed on a WQA on November 6 due to potential water loss while the standpipe was being replaced.

FIGURES



Note: <1 E.coli are shown on the graph as 0 E. coli

Figure 1: Raw Water E.coli Results



Note: <1 Total Coliform are shown on the graph as 0 Total Coliform

BC Drinking Water Treatment Objectives for Surface Water: Total Coliforms in raw water does not exceed 100/100 mL in at least 90% of the weekly samples.

Figure 2: Raw Water Total Coliform Results

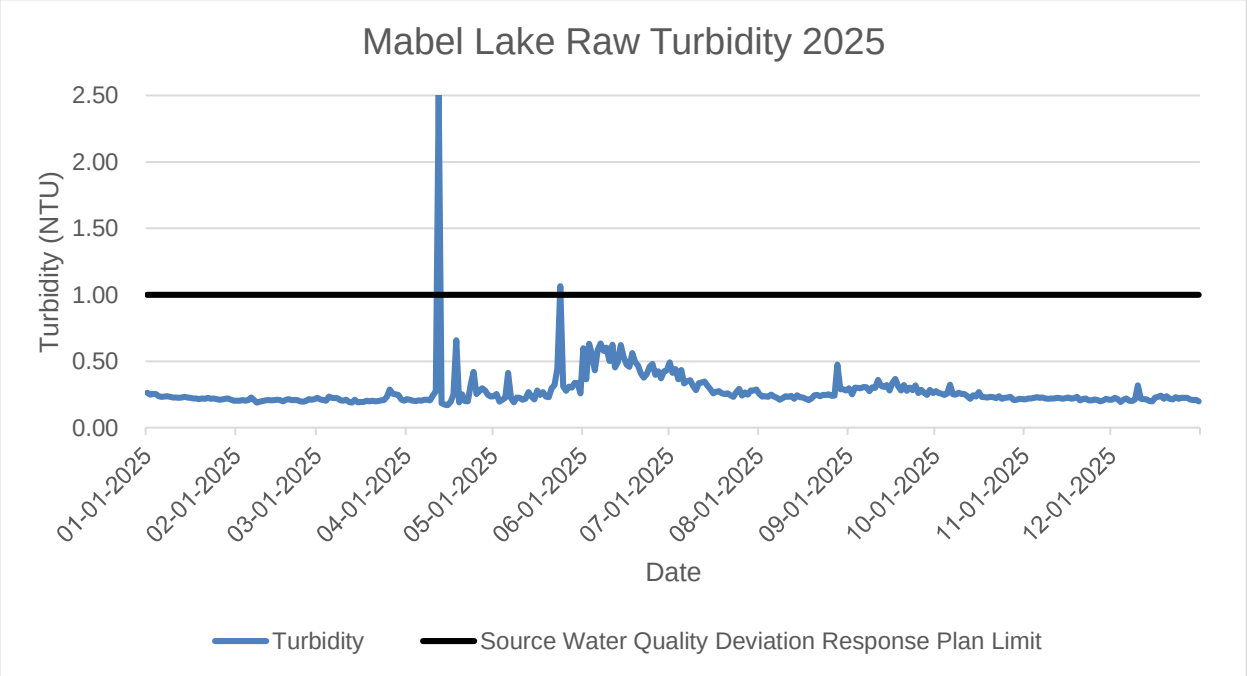


Figure 3: 2025 SCADA for Mabel Lake Raw Turbidity

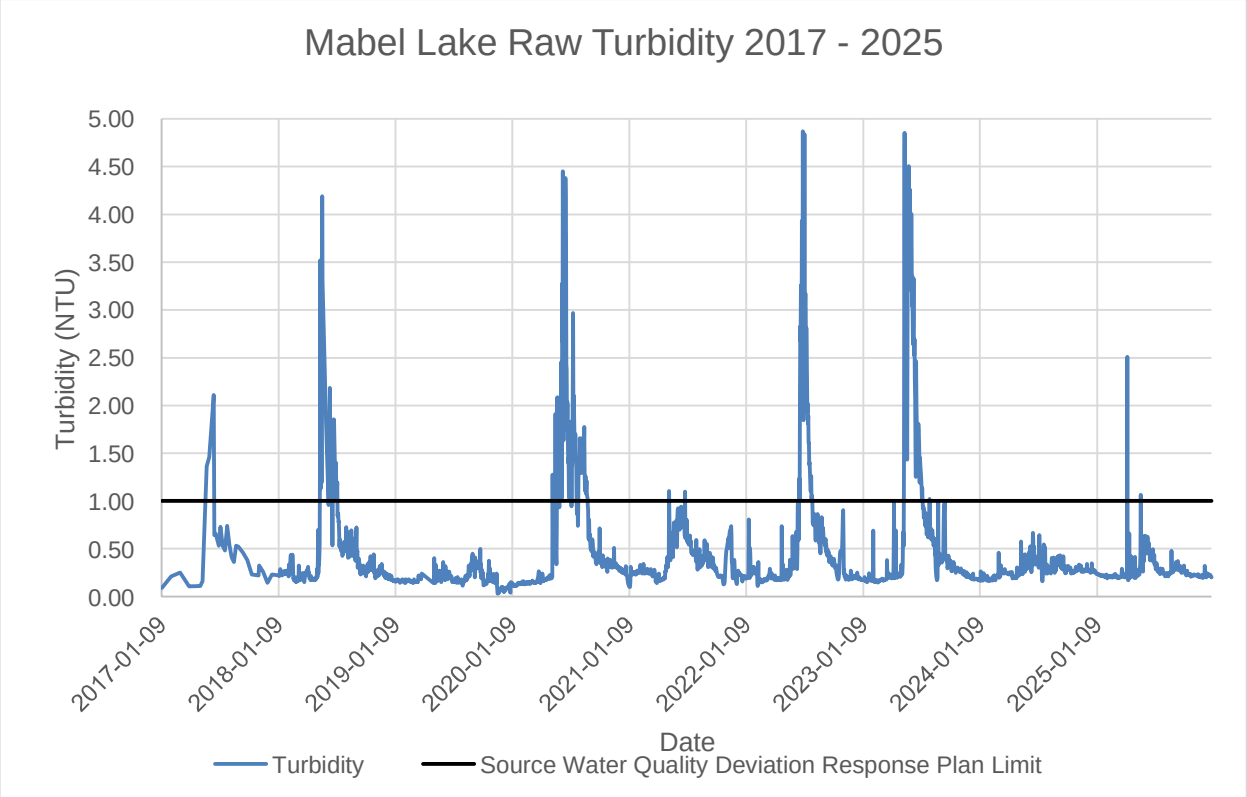


Figure 4: Historic (2017-2025) SCADA Turbidity

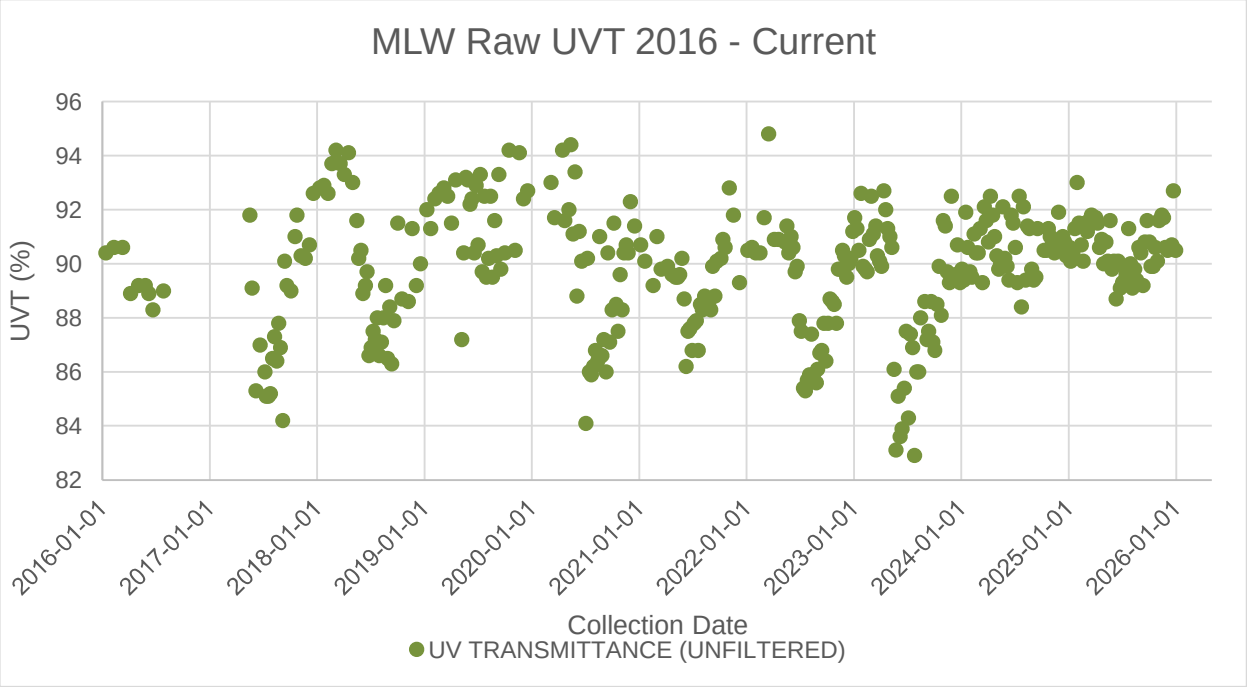


Figure 5: Historic (2016-2025) UVT Filtered and Unfiltered

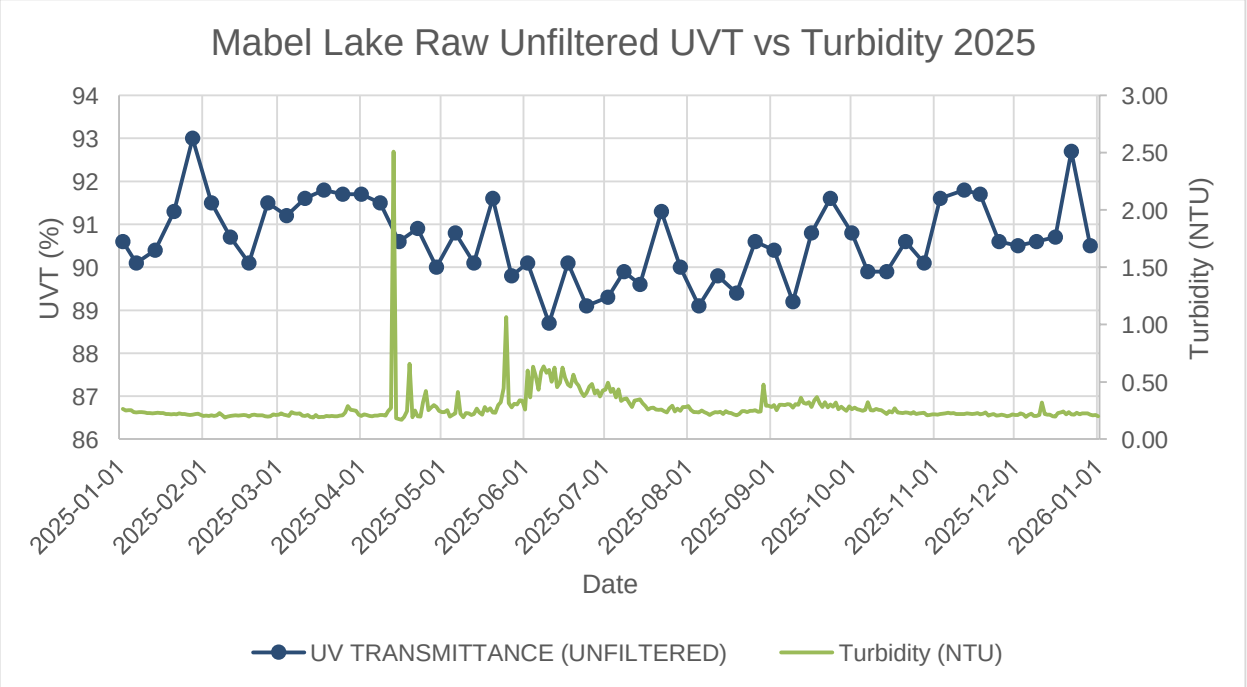


Figure 6: Unfiltered UVT Compared to Turbidity

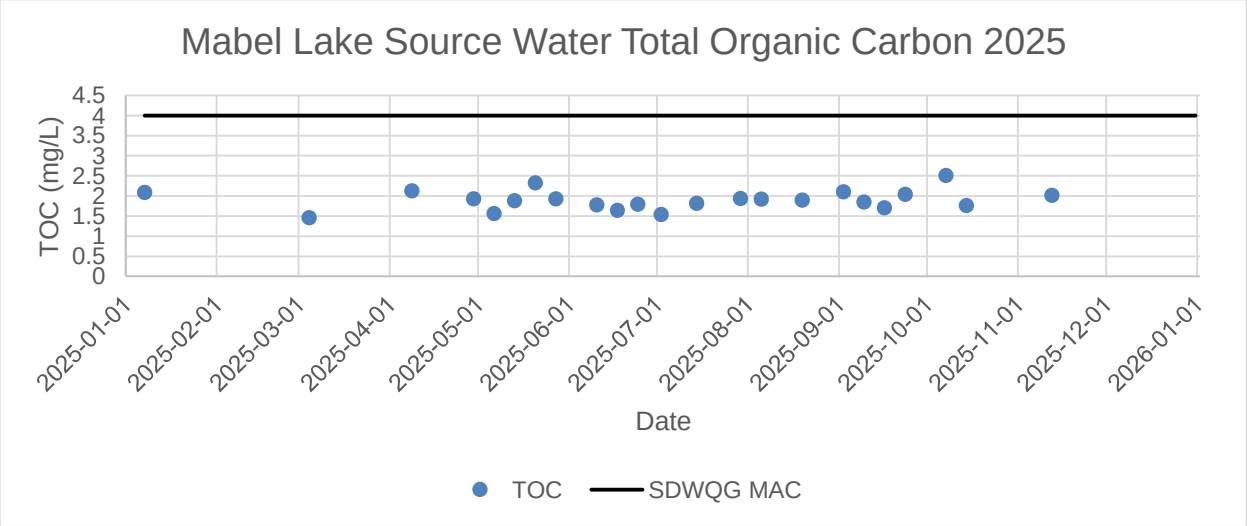
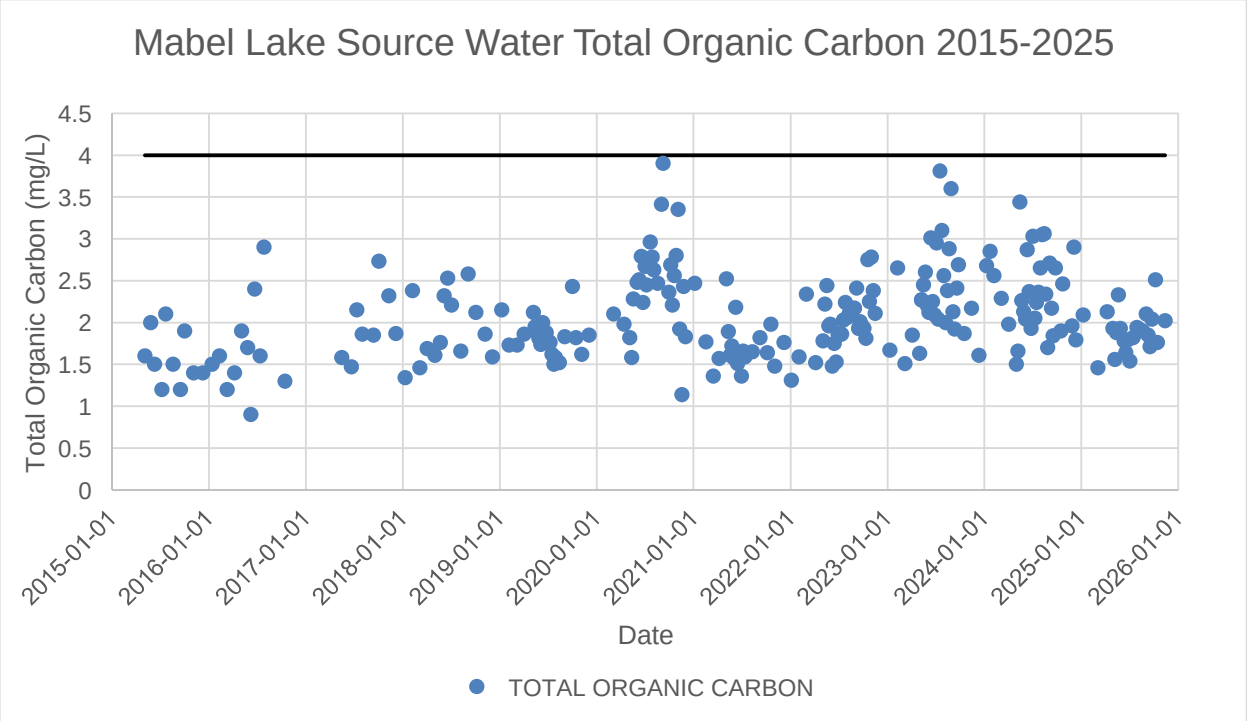
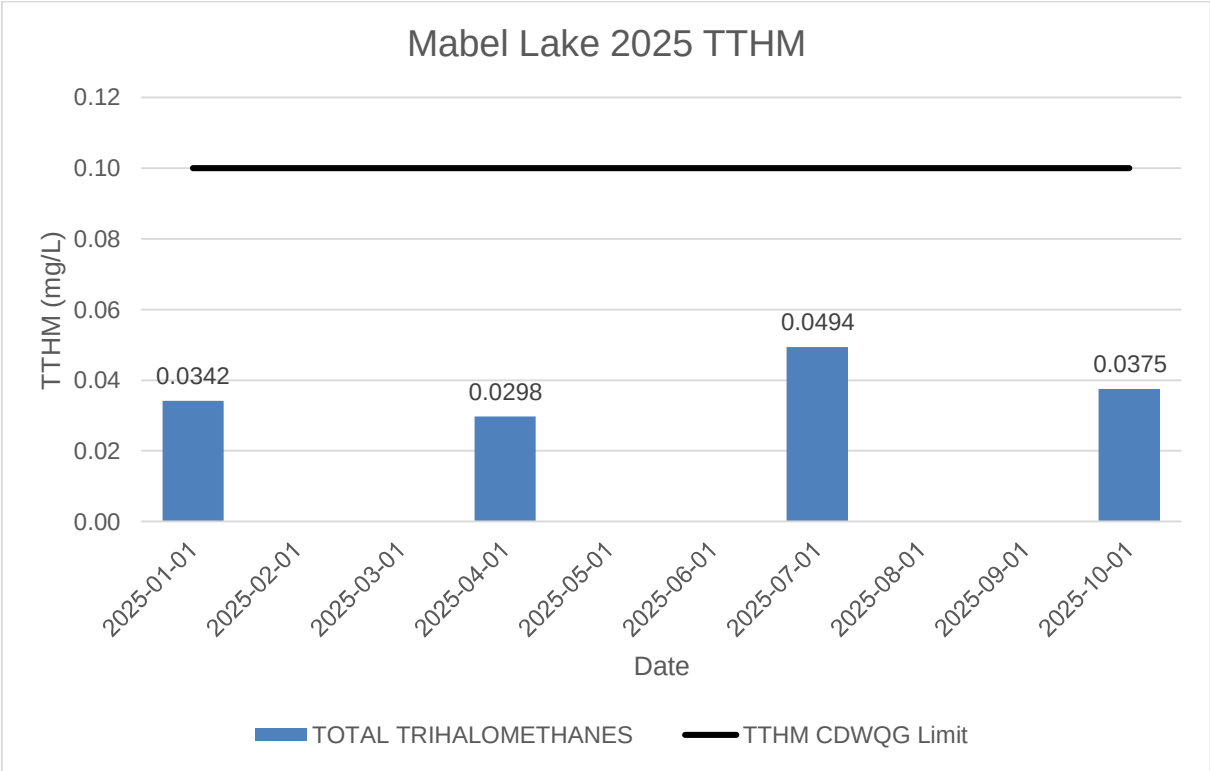


Figure 7: 2025 Mabel Lake Source TOC Results



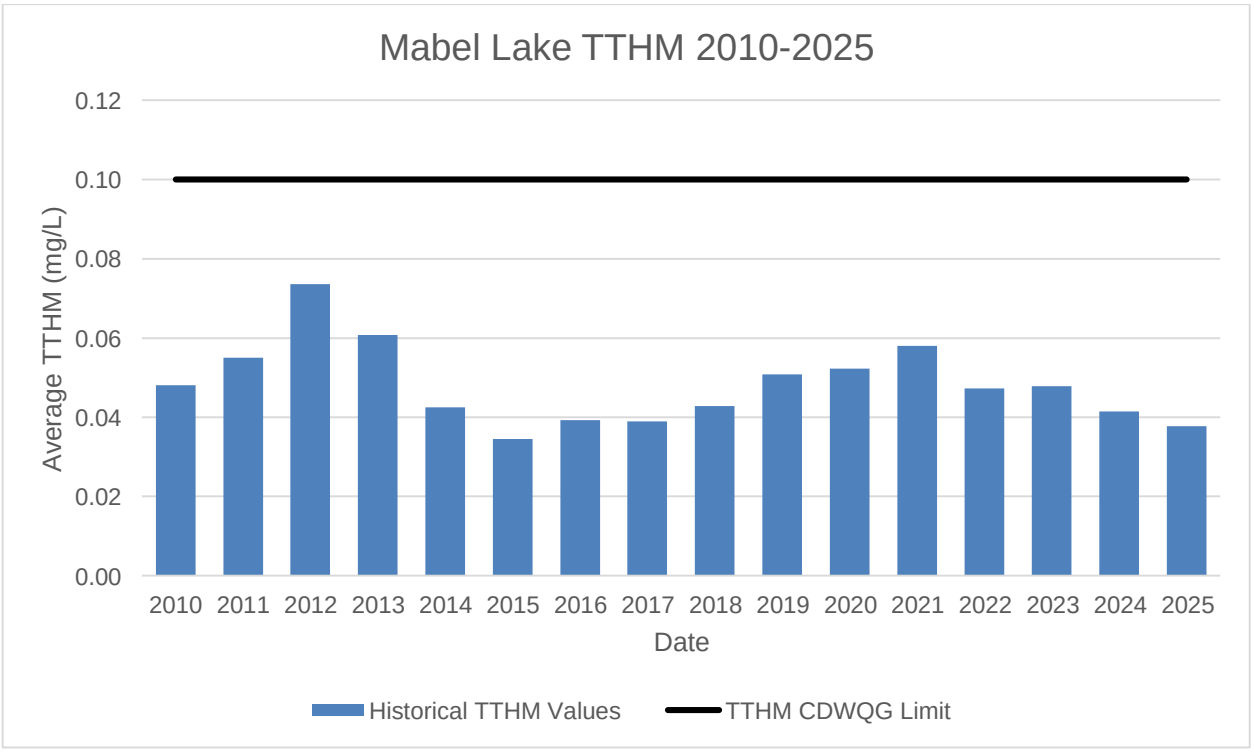
Drinking Water Treatment Objectives for Source Water Supplies in BC (2020): MAC Total Organic Carbon is 4.0 mg/L

Figure 8: Historic (2015-2025) TOC results



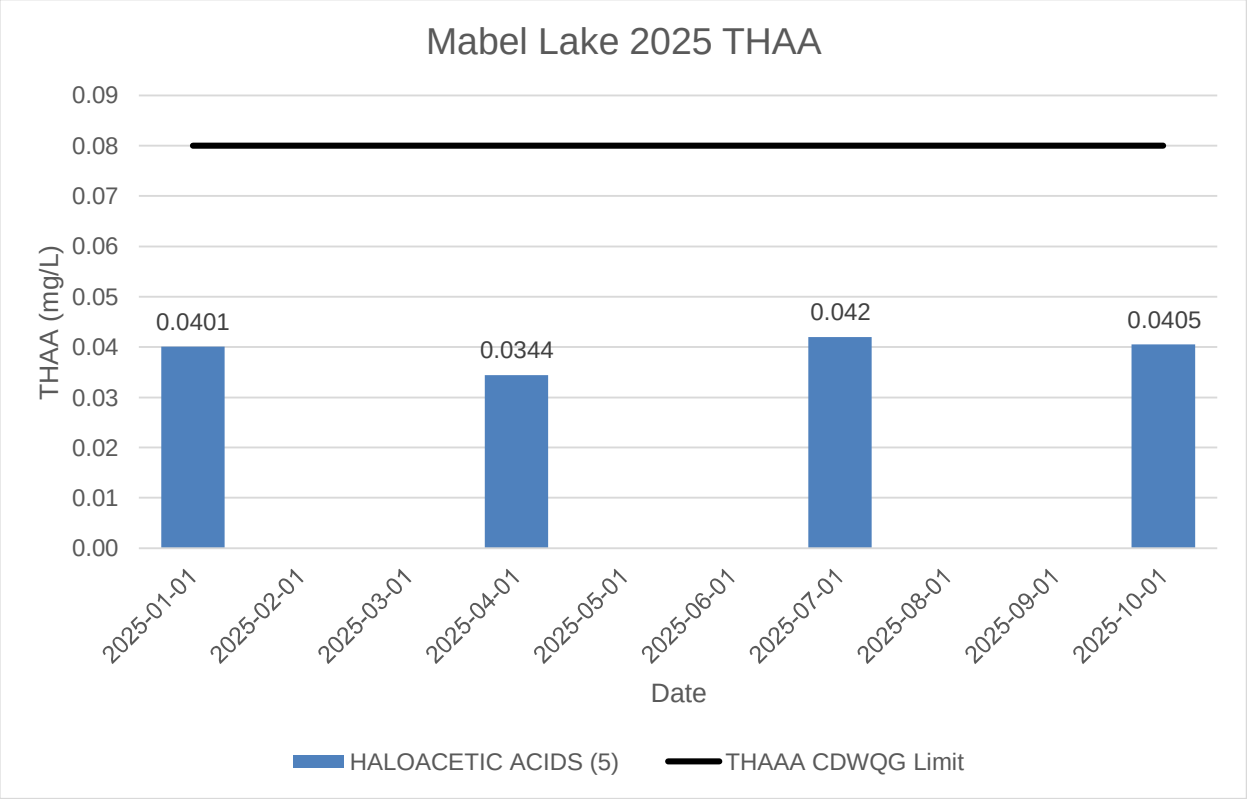
Canadian Drinking Water Guidelines: MAC TTHM is 0.1 mg/L

Figure 9: Mabel Lake TTHM Average for 2025



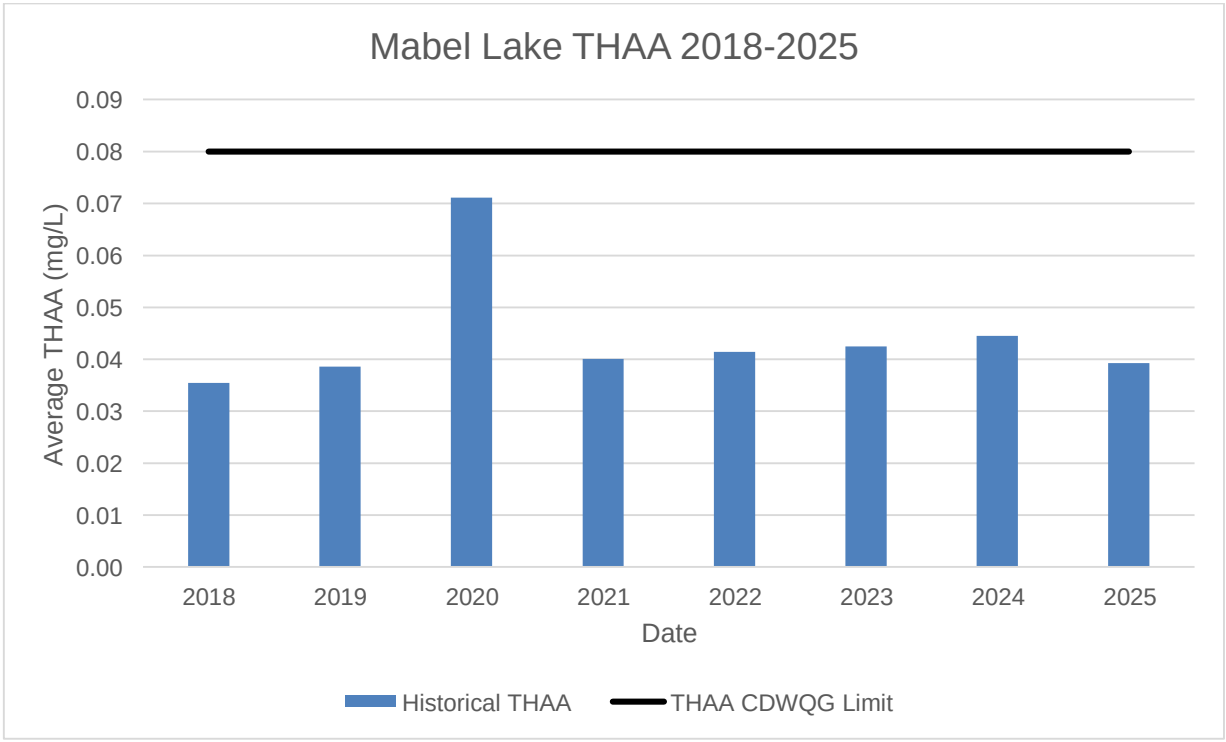
Canadian Drinking Water Guidelines: MAC TTHM is 0.1 mg/L

Figure 10: Historical TTHMs



Canadian Drinking Water Guidelines: MAC TTHM is 0.08 mg/L

Figure 11: THAA Average for Each Sample Date



Canadian Drinking Water Guidelines: MAC TTHM is 0.08 mg/L

Figure 12: Historical THAAs

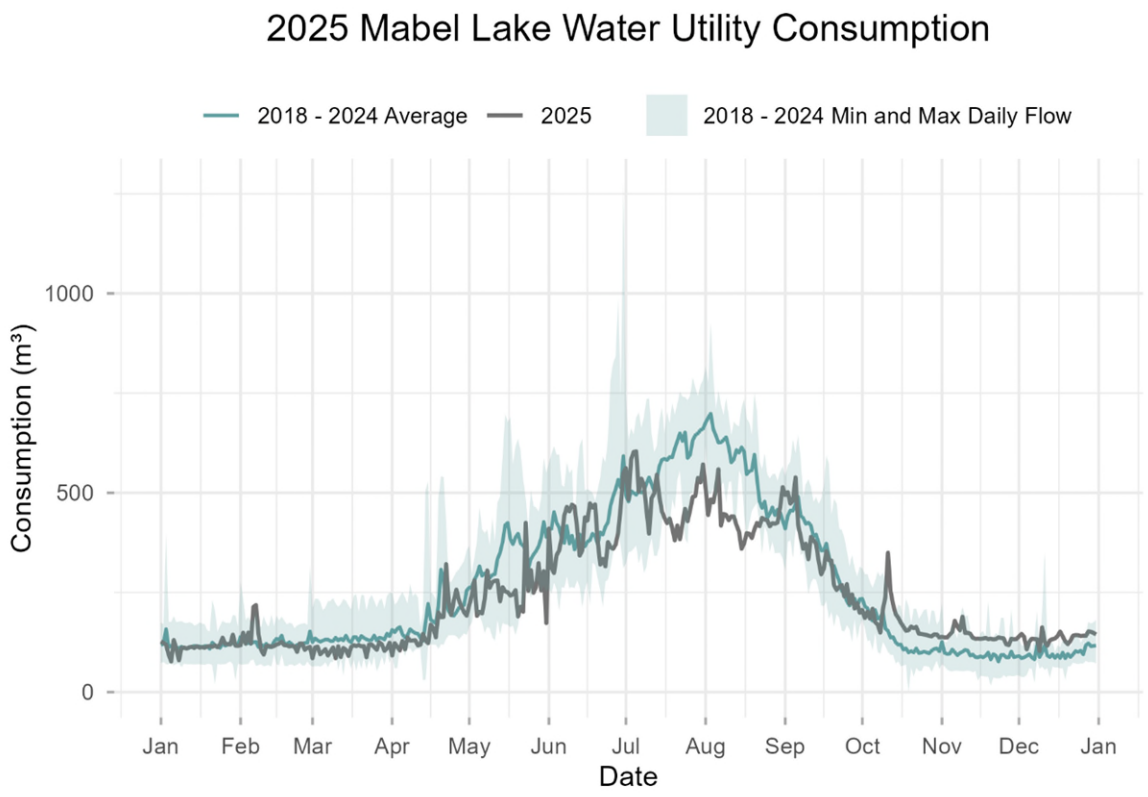


Figure 13: Monthly Water Consumption

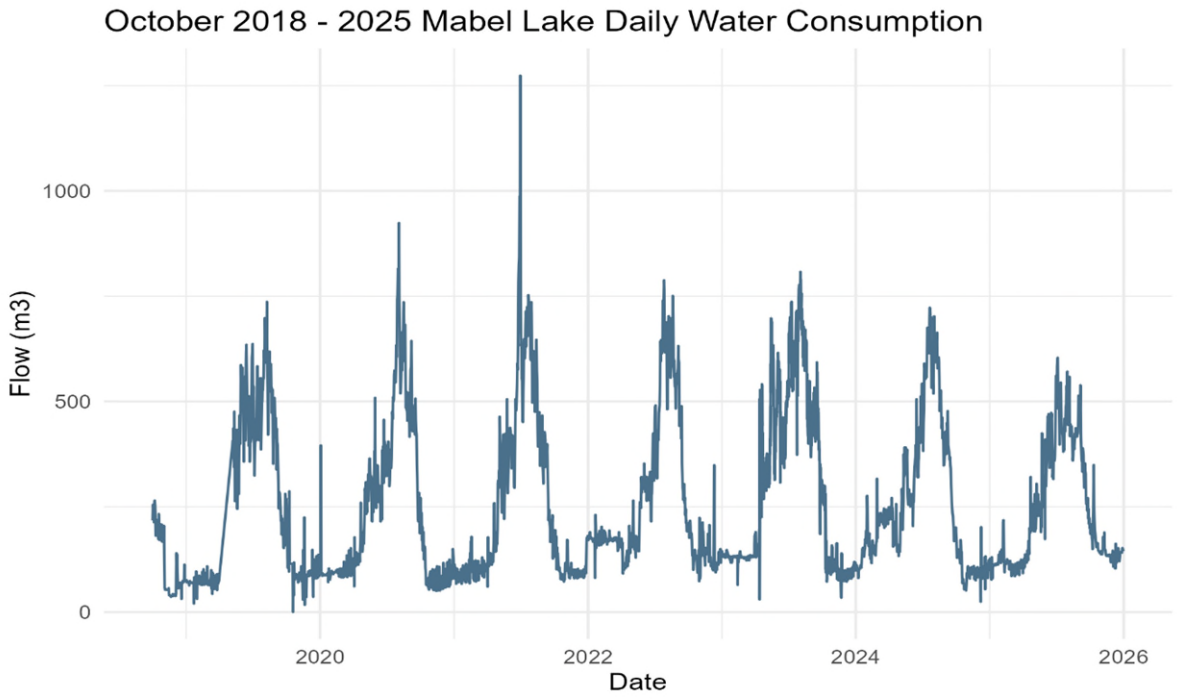


Figure 14: Daily Water Consumption from 2018 to 2025

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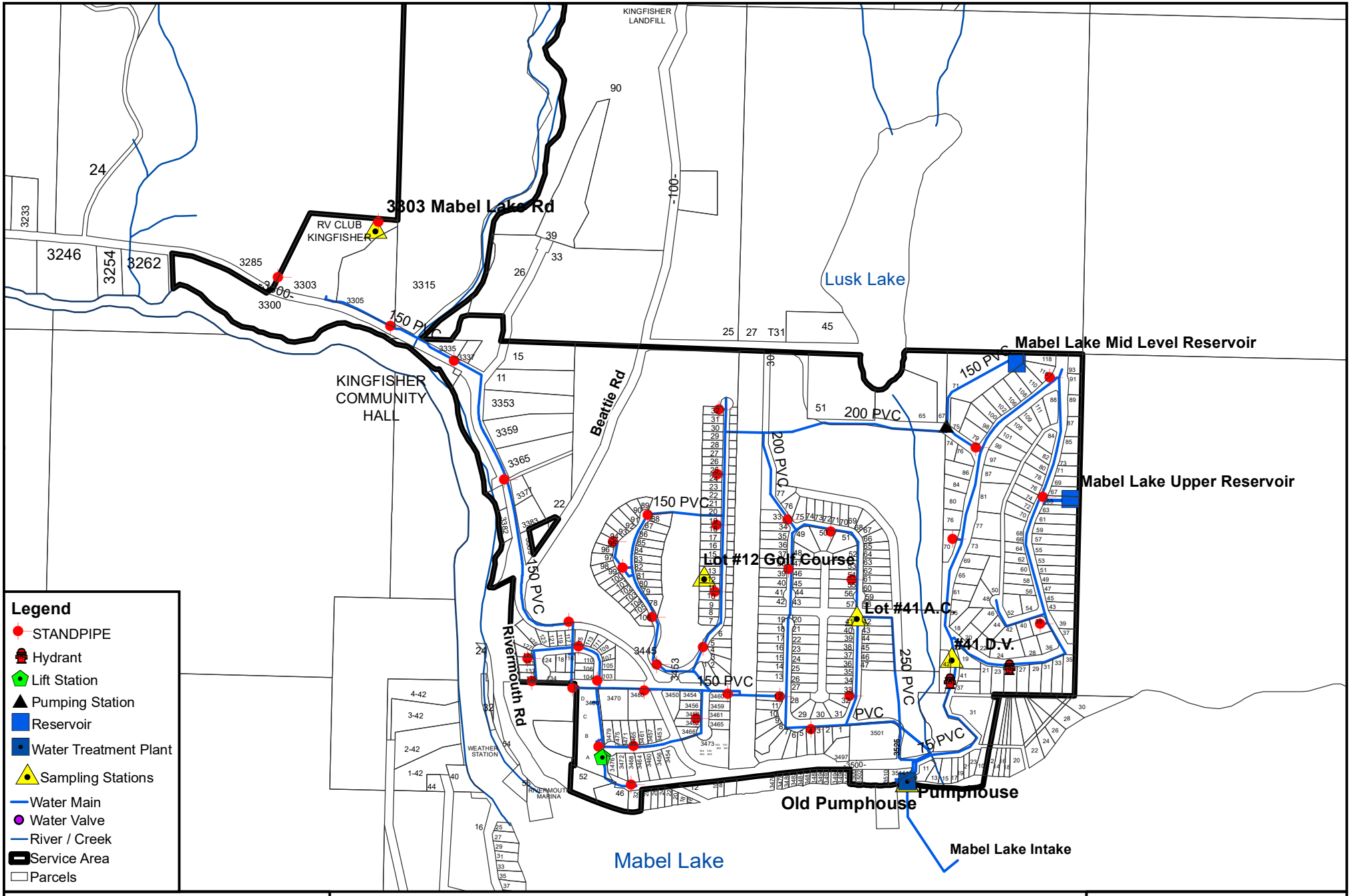
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APPENDIX A

MLW WATER SYSTEM MAP



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.

Mabel Lake Water Utility

REGIONAL DISTRICT NORTH OKANAGAN

RDNO

Plot Date: Mar 24, 2025

Scale: 1:12,000

Plot Size: 11" x 8.5"

0 275 550 1,100 Meters

APPENDIX B

CHLORINE CONTACT TIME

Mabel Lake Water Chlorine Contact Time Calculation 2020

0.25	m	ID = Inside Diameter of transmission main
526	m	L = Length of transmission main
26	m^3	V = Total Volume transmission main
480	USgpm	Q = Maximum Day Demand (MDD) plus fire flow conditions, with 2 distribution pumps and 1 fire pump running, Usgpm
30	L/s	Q_1 = MDD plus fire flow conditions, with 2 distribution pumps and 1 fire pump running, L/s
7.57	L/s	Q_2 = maximum flow rate under Average Day Demand (ADD) conditions, 1 distribution pump running
15.1	L/s	Q_3 = maximum flow rate under Maximum Day Demand (MDD) conditions, 2 distribution pumps running
14	minutes	Contact Time (V/Q_1) = Theoretical Detention Time (TDT) in transmission main, MDD plus fire flow conditions
57	minutes	Contact Time (V/Q_2) in transmission main under ADD conditions, 1 distribution pump running
28	minutes	Contact Time (V/Q_3) in transmission main under MDD conditions, 2 distribution pumps running

The Lakeshore Pump House operates normally under ADD conditions with 1 distribution pump running, but under MDD conditions 2 distribution pumps operate together, or 1 fire pump (see Note 3)

Contact Time in Pipe for ADD conditions assumes duplex flow, where 1 distribution pump is running continuously

Contact Time in transmission main for MDD assumes 2 distribution pumps are running continuously

CT calculation for 1st customer - Cl2 sampling point at water sample station near Lot 42, at airpark taxiway

	Cl_2 Residual mg/L (free) (note 1)	Cl_2 Injection mg/L	pH raw water	Raw Water temp °C (note 2)	CT_a = (Cl_2 * CT in Pipe)	CT_r (Virus) (note 4)	CT_a/CT_r (Virus)	CT (Virus) % Achieved
	Minimum	Minimum	Average	Average	min-mg/L	Required		
ADD, Annual Avg. Temp	1.43	2.00	8.00	9.7	81.3	**8.0**	10.16	100
ADD, Winter Temp	0.86	2.00	8.00	6.2	48.9	**8.0**	6.11	100
ADD, Summer Temp	0.92	2.00	8.00	12.2	52.3	**6.0**	8.72	100
MDD, Annual Avg. Temp	1.43	2.00	8.00	9.7	40.8	**8.0**	5.09	100
MDD, Winter Temp	0.86	2.00	8.00	6.2	24.5	**8.0**	3.06	100
MDD, Summer Temp	0.92	2.00	8.00	12.2	26.2	**6.0**	4.37	100
MDD+fire flow, An. Avg. Temp	1.43	2.00	8.00	9.7	20.3	**8.0**	2.54	100
MDD+fire flow, Winter Temp	0.86	2.00	8.00	6.2	12.2	**8.0**	1.53	100
MDD+fire flow, Summer Temp	0.92	2.00	8.00	12.2	13.1	**6.0**	2.18	100

Notes:

1. Normal residual Cl2 range at 1st customer is 0.86 to 2.12 mg/L, minimum is 0.86 mg/L, average is 1.43 mg/L based off 2019 data.
2. Temperature average is about 9.7°C with lows of near 6°C in Winter months, and highs near 12°C in Summer.
3. Peak Flow Rates occur normally in Summer when water temperatures are warmest.
4. From CT Values Table B-2 of US EPA Guidance Manual LT1ESWTR Disinfection Profiling and Benchmarking

virus log inactivation = $4*(Ct_a/CT_r)$ log

virus percent achieved =$100-(100/(10^{(4*CT_a/CT_r)}))$ $\log(x)=4*CT_a/CT_r \Longrightarrow x=10^{(4*CT_a/CT_r)}$ x_{virus} = 2.38E+20

Completed by: ZM
Update (JdeP): August 25, 2020

Date Printed: 8/31/2020, 10:02 AM

APPENDIX C

OPERATING PERMIT

PERMIT VALIDATION

Interior Health

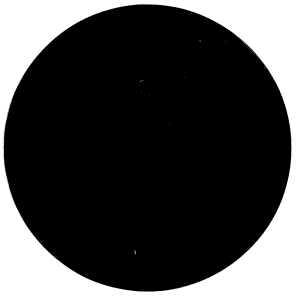
ACCOUNTS RECEIVABLE
12-945 Columbia St W, Kamloops, BC V2C 1L5
Toll Free: 1-844-868-5200 ext. 10365 – Local Calls: 778-362-6810 ext. 10365
Email: hp.billing@interiorhealth.ca

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
Mabel Lake Water Utility
9848 Aberdeen Rd
Vernon BC V1B 2K9
Canada

Permit Number:	**006157**
Issue Date:	19-Mar-2024
Expiry Date:	31-Mar-2025
Facility Number:	0412111
Facility Name:	Mabel Lake Water Utility

Drinking Water System 15 - 300 Connections



APPENDIX D

CONDITIONS ON PERMIT

Interior Health

Environmental Health Protection
1340 Ellis Street,
Kelowna, BC V1Y 9N1

October 04, 2010

Al Cotsworth, P.Eng
Utilities Manager
Regional District of North Okanagan
9848 Aberdeen Road
Coldstream, BC
V1B 2K9

Re: Mabel Lake Water Utility
Drinking Water Quality Improvement Program – 2010 Conditions on Permit

Interior Health is pleased to acknowledge our mutual accountability to drinking water consumers and our shared commitment with the **Mabel Lake Water Utility**. The intent of the Drinking Water Quality Improvement Program is to provide consistent and clear expectations for all stakeholders and to ensure consistent program delivery throughout the Interior Health region. The foundation of the Drinking Water Quality Improvement Program is a set of typical terms and conditions that may be attached to the Operating Permit. The Drinking Water Quality Improvement Program provides a documented and verifiable management system for promoting and protecting public health.

Water Suppliers and Interior Health recognize the need for working relationships to consistently achieve good quality drinking water. We expect to have on-going long term planning discussions with the outcome of setting target dates for staged improvements.

All participating water systems should develop realistic and attainable target dates to implement 43210 as described below.

- **4** log (99.99%) inactivation of Viruses
- **3** log (99.9%) inactivation or removal of *Giardia* and *Cryptosporidium*
- **2** treatment processes for all surface drinking water systems
- **1** for <1 NTU of turbidity with a target of 0.1 NTU
- **0 Total coliform, 0 fecal coliform and 0 *E. coli***

The following terms and conditions on your Permit to Operate are placed under Section 8 of the Drinking Water Protection Act. As such, there is a legal requirement to comply with all terms and conditions of the permit. It is important to note that any amendment of an operating permit must occur in accordance with section 8 (4) of the Act, which requires prior consultation with the water supplier and consideration of any comments the water supplier may provide in respect of the proposed changes. These consultations have occurred on an annual basis prior to the issuance of the yearly Conditions on Permit letter.

The terms and conditions in this letter will supersede and update previous terms and conditions:

1. **Provide a Source Protection Plan for Each Water Source**

Status:

- Source Assessment/Assessment Response Plan has not yet been initiated for the Mabel Lake Drinking Water Source/Intake.

Objective:

- Initiate and complete a Source Water Assessment that will address (at a minimum) the requirements contained within Modules 1, 2, 7 & 8 of the BC Comprehensive Drinking Water Source to Tap Assessment Guideline.
  - Schedule an initial source water assessment meeting with the Drinking Water Officer & Technical Advisory Committee (TAC) to establish a scope of study prior to issuance of Assessment Terms of Reference.
  - Engage the TAC to review the characterization and delineation of the source watershed (Module 1) and contaminant survey (Module 2).
  - Engage the TAC to review the characterization of risks (Module 7) and the recommended actions to improve drinking water protection (Module 8)
- The completed Source Water Assessment will provide the basis for the development of an Assessment Response Plan.
- Initiate an Assessment Response Plan, including the establishment of strategies and target dates for resolving issues/report recommendations, maintaining a source protection program and contingency, and emergency planning.

Target Date:

- Provide a capital plan and proposed timeline for initiating a Source Assessment per the above objectives by March 31, 2011.
- Complete a Source Assessment per the above objectives by March 31, 2012.
- Initiate an Assessment Response Plan & demonstrate that a Source Protection Plan is in place by October 1, 2012.

2. **Provide a Certified Operator to Operate the System**

Status:

- This system has been EOCP classified in the past as a Small Water System.
- Lane Skead is the principal operator & holds Small Water System Certification.

Objective:

- Please confirm current EOCP system classification (Water Distribution & Water Treatment) and provide new classification as required/as system is upgraded.
- Maintain a certified operator at the level of system classification for both treatment and distribution requirements.

Target Date:

- Provide current EOCP system classification by November 30, 2010.
- Provide confirmation of operator certification at level of system classification by Dec 01, 2010 or, provide a work plan which outlines course/hour requirements and proposed date for attaining required operator certification to system classification (by Dec 01, 2010).

3. **Provide a Drinking Water Quality Monitoring Program**

Status:

- A total of 1 raw water and 4 treated water bacterial samples are collected monthly (one set per month collected by operator and one set per month by RDNO staff).

- A 2010/2011 Water Quality Monitoring Program update has not been provided for review detailing sample sites for bacteriological, chemical and chlorine residual checks (include a distribution map), to ensure that a representative set of samples are collected from end of line sites, different pressure zones, post reservoirs, etc.

Objective:

- Provide an annual written Drinking Water Quality Monitoring Program update for the Mabel Lake Water Utility system with established schedules for systematic & routine sampling to ensure that a representative set of samples are collected from end of line sites, different pressure zones, post reservoirs, etc, including:
  - A treatment and distribution system map to identify raw and distribution bacteriological sampling points and schedules.
  - Chemical sampling point(s) and schedules for basic potability monitoring (raw water chemical & distribution THM, turbidity, etc).

Target date:

- Update to be provided prior to July 1st each year.

4. **Develop a Cross-Connection Control Program**

Status:

- A cross-connection control program has not yet been initiated at this water system.

Objective:

- Implement a Cross-Connection Control Program that is consistent with industry Best Management Practices. Refer to the BCWWA cross connection control page for information: http://www.BCWWA.org. Ensure completion of surveys, routine maintenance, tracking & testing of devices and education initiatives.
- Provide an annual Cross-Connection Control Program update including % of ACII (Agricultural, Commercial, Industrial, Institutional) and residential connections assessed, number of backflow preventors installed, tracking of backflow prevention devices and testing, as well as education initiatives.

Target Date:

- Confirm capital for a Cross-Connection Control Program at the Mabel Lake Water Utility by March 31, 2011.
- Initiate a Cross-Connection Control Program for this system per the above objectives by July 01, 2011.
- Provide an annual Cross-Connection Control Program update prior to July 1st each year.

5. **Provide Continuous On-line Monitoring of the Water Disinfection Process**

Status:

- On-line chlorine residual analyzer has been installed and is monitored/recorded on SCADA.

Objective:

- Please confirm SCADA alarm set-points & callout capacity to operator/RNDO staff for exceedance of a chlorine alarm/loss of chlorine and include response in ERP.
- Provide SCADA summary information on the water disinfection process in monthly reports (ie. cl residual summary graph).

Target Date:

- Confirm installation of SCADA alarming & callout capacity per the above objective prior to March 31, 2011.
- Include SCADA summary information in monthly reports starting November 01, 2010.

6. **Provide Continuous On-line Turbidity Sampling and Recording of Raw Water for Each Surface Source**

Status:

- On-line turbidity meter has been installed prior to the point of disinfection and is monitored/recorded on SCADA.

Objective:

- When water turbidity measured at the above referenced turbidity monitoring point and taken as a 24 hour rolling average exceeds 1NTU, the water supplier must make verbal contact with the Health Department. Please confirm SCADA alarm set-points & callout capacity to operator/RNDO staff for exceedance to a turbidity alarm set-point and include response in ERP.
- Provide SCADA summary information on turbidity in monthly reports (ie. turbidity summary graph).

Target Date:

- Confirm installation of SCADA alarming & callout capacity per the above objective prior to March 31, 2011.
- Include SCADA summary information in monthly reports starting November 01, 2010.

7. **Provide Long-term Plans for Source, Treatment and Distribution System Improvements Taking into Account the Goal of 43210 Treatment Objectives**

Status:

- Lake pumphouse/treatment facility currently has single disinfection only (ie. chlorination).
- We note that an RFP has been confirmed by Rod Pleasance for a study of water treatment options in 2010/2011 at the Mabel Lake Water Utility. Both filtration and UV technologies will be evaluated as indicated by RDNO, relative to meeting the 43210 Drinking Water Objectives. Where filtration deferral is being contemplated, we note that a Filtration Deferral Application has not been received or reviewed for the Mabel Lake Water Utility & accordingly, the utility has not yet demonstrated that this source meets all of the filtration deferral criteria.

Objective:

- **Provision of two forms of disinfection is required as criteria to apply to defer filtration but does not guarantee that filtration deferral is acceptable.**
- **Provide treatment processes that will fully meet the 43210 treatment objectives including two methods of disinfection by 2013 if filtration deferral is contemplated.**
- **If filtration deferral is not contemplated then disinfection with filtration or equivalent technologies is required prior to 2015 for all source water.**
- Conceptual plans for filtration must be identified with or without filtration deferral.
- Filtration deferral plans will be reviewed annually and water suppliers must be prepared to install filtration within 2 years in the event that any of the following occur:
    1. waterborne illness outbreak

2. excess of avoidable disinfection byproducts
3. failure to provide or meet the filtration deferral criteria monitoring requirements
4. significant degradation of raw water quality and,
5. health threats

- A financial plan for filtration/full 43210 treatment is therefore required, with or without grant funding and with or without the potential to defer filtration.
- The implementation plan must ensure a land footprint is available for a filtration plant, identify a selected technology, confirm financial planning and, identify staged and continuous benchmarks with clear target dates.
- Water Suppliers must provide progress reports with implementation of treatment infrastructure upgrades.

Target date:

- Provide a written plan demonstrating how the above/below objectives will be met prior to March 31, 2011, including timelines for completion and confirmation of capital to complete necessary works.
- Where filtration deferral is contemplated, demonstrate that the Filtration Deferral Criteria can be met through an Application to Defer Filtration (by March 31, 2011). Refer to the Interior Health Drinking Water Filtration Policy document for required information to be included in an Application for Filtration Deferral (see attached).

8. Review and Update the Emergency Response Plan Annually

Status:

- Interior Health has not received a 2009-2010 Emergency Response Plan.
- As noted during our September 27, 2010 site inspection, operator (Lane Skead) has not been provided with an Emergency Response Plan and has not received Emergency Response Training on what situations are considered "Emergency Situations", response procedures, corrective action/public notification and contact procedures to inform RDNO staff & IH.

Objective:

- Provide an Emergency Response Plan to address public notification and corrective measures in response to deviation from acceptable operating range /emergency situation, including:
  - Turbidity events
  - Disinfection residual
  - Bacterial sampling results
  - Loss of pressure/loss of water/backflow
  - Source contamination

Target Date:

- Operator must be provided with an up-to-date ERP for the Mabel Lake Water Utility and receive training on Emergency Response by November 01, 2010 (also provide an up-to-date copy to IH for review).
- Please provide an up-to date Emergency Response Plan prior to March 1st annually.

9. Provide Monthly Reports and an Annual Summary

Status:

- Bacteriological sample results are provided monthly, additional monitoring information is required in monthly reporting per the below objectives.
- Interior Health has not received a 2009/2010 annual report for Mabel Lake Water Utility.

Objective:

Monthly reporting should include (as applicable):

- Daily water consumption.
- Microbiological test results.
- SCADA/Continuous online monitoring information on chlorine residuals & turbidity.
- Comments on source, treatment, distribution system events. Any variances from normal operations for the facility are commented on and explained in written text.
- Records of customer complaints and response.
- Operational activities.

Annual reports should include:

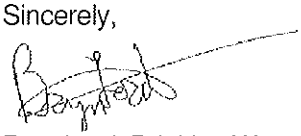
- Annual consumption/water quality summary data.
- Updates to Water System Assessment and Capital Works Plan.
- Updates to Water Monitoring Plan.
- Updates to Emergency Response Plan.
- Updates to Cross Connection Control Program.
- Provide Environmental Operators Certification Program updates.

Target Date:

- Monthly reports to be submitted by the 15th day of the following month.
- Send to: bryn.lord@interiorhealth.ca
- Annual reports should be submitted prior to July 1st annually.

Thank you for your continuing cooperation. I look forward to working with you over the coming year.

Sincerely,



Bryn Lord, Drinking Water Officer
Interior Health Authority
1340 Ellis Street
Kelowna, BC V1Y 9N1

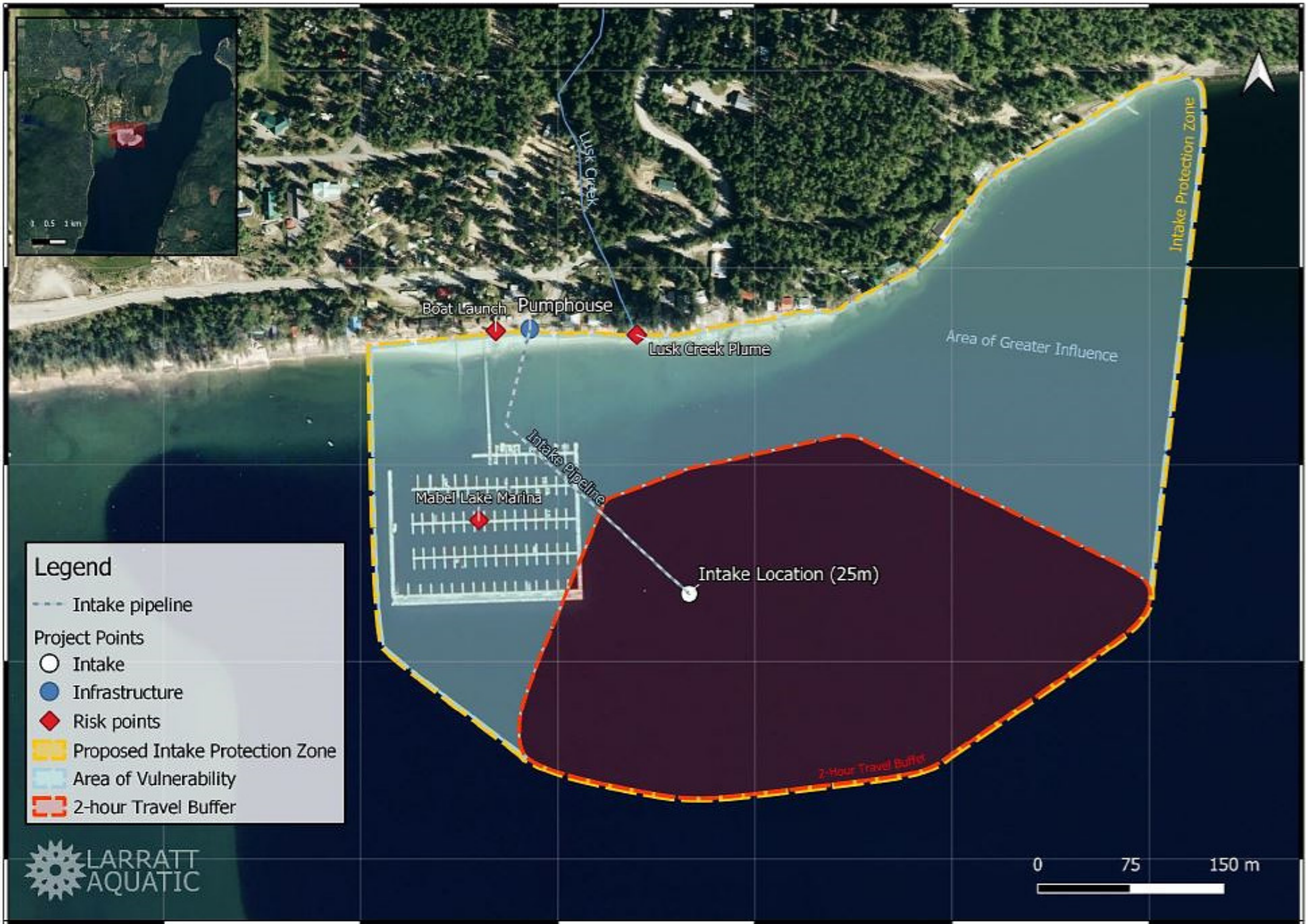
Phone: (250) 308-9288
Fax: (250) 868-7760

Copies: Dr. Paul Hasselback, Medical Health Officer
Ivor Norlin, Acting Assistant Director
Mike Adams, Okanagan Service Area Team Leader
Gundie Volk, Okanagan Service Area Team Leader
Christina Yamada, Public Health Engineer

APPENDIX E

2021 MABEL LAKE INTAKE PROTECTION ZONE

Intake Protection Zone - Intake Inspection



APPENDIX F

2025 SAMPLING PROGRAM and SCHEDULES

Operator Tasks		
Sampling	Weekly	Tuesdays
Chlorine	Weekly	At all distribution sites use handheld meter and log data
Turbidity	Weekly	At all distribution sites use handheld meter and log data
pH	Weekly	At all distribution sites use handheld meter and log data
Conductivity		At all distribution sites use handheld meter and log data
Bottle drop off	Bring bottles to RDNO for analysis and shipping to CARO if required	
Instument cleaning and calibration	Bring instruments to RDNO according to instrument schedule	
Turbidity (online) meter cleaning	Flush, clean, and calibrate online turbidity meter quarterly (March, June, September and December) and write when flushed, cleaned, calibrated and any other comments in online operator's log.	

Sample Sites	
Site Type	**Sample Site Name**
Source	Mabel Lake Intake
Distribution	3525 Enderby Mabel Lake Road SS
Distribution	3303 Enderby Mabel Lake Road SS
Distribution	Cessna Road SS
Distribution	Dolly Varden Road SS
Distribution	Mabel Lake PS

Handheld Instrument Calibration by RDNO		
Parameter	**Instrument Name**	**Frequency**
Chlorine	HANNA Chlorine Meter (HI 97711)	Annually
Turbidity	HACH 2100Q	Quarterly
pH	Oakton pH Testr	Monthly
Conductivity	Oakton ECO Testr	Monthly

2025 Mabel Lake Water Utility Water Quality Monitoring Program

Sampling Schedule

Source Analysis			
Sample Sites	**Frequency**	**RDNO Lab Parameters**	**Caro Lab Parameters**
Mabel Lake Intake	Weekly	Bacterial	
	Weekly	UVT Unfiltered	
		Algae Density	
	Monthly (Low Season)		TOC
	Weekly (Peak Season)		TOC
	Quartery (January, April, July, October)	Apparent Colour	

Distribution Analysis			
Sample Sites	**Frequency**	**RDNO Lab Parameters**	**Caro Lab Parameters**
3525 Enderby Mabel Lake Road SS	Monthly (Low Season)	Bacterial	
	Weekly (Peak Season)	Bacterial	
3303 Enderby Mabel Lake Road SS	Monthly (Low Season)	Bacterial	
	Monthly (Peak Season)	Bacterial	
	Quarterly (January, April, July, October)		THM
	Quarterly (January, April, July, October)		HAA
Cessna Road SS	Monthly (Low Season)	Bacterial	
	Monthly (Peak Season)	Bacterial	
Dolly Varden Road SS	Monthly (Low Season)	Bacterial	
	Monthly (Peak Season)	Bacterial	
Mabel Lake PS	Monthly (Peak Season)	Bacterial	

*Note: Sample sites are on a 4 week rotation during Low Season and Peak Season

Revision Date: January 15, 2025 by CC

2025 Mabel Lake Water Utility Water Quality Monitoring Program

Bottles and Parameters

Source Sampling		
Sites	**Bottles**	**Parameters**
Mabel Lake Intake	1 - PA Bottle	Total Coliform, E. Coli
	1 - 500 mL in house	UVT Unfiltered Apparent Colour (January, April, July, October)
	1 - 1L Bottle	Algae Density

Distribution Sampling		
Sites	**Bottles**	**Parameters**
3525 Enderby Mabel Lake Road SS	1 - PA Bottle	Total Coliform, E. Coli
3303 Enderby Mabel Lake Road SS	1 - PA Bottle	Total Coliform, E. Coli
	2 - THM bottles	THM's
	2 - HAA bottles	HAA's
Cessna Road SS	1 - PA Bottle	Total Coliform, E. Coli
Dolly Varden Road SS	1 - PA Bottle	Total Coliform, E. Coli
Mabel Lake PS	1 - PA Bottle	Total Coliform, E. Coli

Peak Season:

May to September

8 Distribution Bacterial Samples Per Month

Low Season

January to April and October to December

4 Distribution Bacterial Samples Per Month

Revision Date: January 15, 2025 by CC

2025 Mabel Lake Water Utility Water Quality Monitoring Program

Annual Comprehensive Source Sampling

Surface Source Comprehensive Analysis Schedule		
Sample Site	**Frequency**	**When**
Mabel Lake Intake	Annually	**October**
Annual sampling occurs in October each year		
Bottles for Annual Surface Water Source Sampling		
1 -PA bottle		
1 - 125 mL Metals		
1 - 100 ml Glass metals (Mercury)		
1 - Cyanide		
1 - 1 L Caro		
1 - TOC		
1 - 1 L Algae Density		
1 - 4L Chlorophyll A		

APPENDIX G

2025 RAW WATER COMPREHENSIVE ANALYSIS

Mabel Lake Intake Water Quality 2025

Water System: Mabel Lake Water Utility
Source: Mabel Lake

Sampling Point: Mabel Lake Intake
Date of Sample: October 10, 2025

Parameter	Result	Guideline	Unit
ALKALINITY (BICARBONATE, AS CACO3)	57.9	N/A	mg/L
ALKALINITY (CARBONATE, AS CACO3)	<1.0	N/A	mg/L
ALKALINITY (HYDROXIDE, AS CACO3)	<1.0	N/A	mg/L
ALKALINITY (PHENOLPHTHALEIN, AS CACO3)	<1.0	N/A	mg/L
ALKALINITY (TOTAL, AS CACO3)	48	N/A	mg/L
ALUMINUM (TOTAL)	0.0174	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)	0.0097	MAC = 2	mg/L
BERYLLIUM (TOTAL)	<0.0001	N/A	mg/L
BISMUTH (TOTAL)	<0.0001	N/A	mg/L
BORON (TOTAL)	<0.05	MAC = 5	mg/L
CADMIUM (TOTAL)	<0.00001	MAC = 0.007	mg/L
CALCIUM (TOTAL)	16.6	N/A	mg/L
CHLORIDE	0.61	AO ≤ 250	mg/L
CHLOROPHYLL A	<1.0	N/A	µg/L
CHROMIUM (TOTAL)	<0.0005	MAC = 0.05	mg/L
COBALT (TOTAL)	<0.0001	N/A	mg/L
COLOUR (TRUE)	5.5	AO ≤ 15	TCU
CONDUCTIVITY	113	N/A	µS/cm
COPPER (TOTAL)	0.00101	MAC = 2	mg/L
CYANIDE (TOTAL)	<0.002	MAC = 0.2	mg/L
DISSOLVED ORGANIC CARBON	1.68	N/A	mg/L
FLUORIDE	<0.1	MAC = 1.5	mg/L
HARDNESS (TOTAL, AS CACO3)	49.9	N/A	mg/L
IRON (TOTAL)	0.015	AO ≤ 0.3	mg/L
LEAD (TOTAL)	<0.0002	MAC = 0.005	mg/L
LITHIUM (TOTAL)	0.00064	N/A	mg/L
MAGNESIUM (TOTAL)	2.04	N/A	mg/L
MANGANESE (TOTAL)	0.00109	MAC = 0.12	mg/L
MERCURY (TOTAL)	<0.00001	MAC = 0.001	mg/L
MOLYBDENUM (TOTAL)	0.00074	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
NITROGEN (TOTAL)	0.089	N/A	mg/L
PHOSPHORUS (TOTAL DISSOLVED)	<0.0050	N/A	mg/L
PHOSPHORUS (TOTAL)	<0.0050	N/A	mg/L
PH	7.89	7.0-10.5	pH units
POTASSIUM (TOTAL)	0.85	N/A	mg/L
SELENIUM (TOTAL)	<0.0005	MAC = 0.05	mg/L
SILICON (TOTAL, AS SI)	3.4	N/A	mg/L
SILVER (TOTAL)	<0.00005	N/A	mg/L
SODIUM (TOTAL)	1.24	AO ≤ 200	mg/L
STRONTIUM (TOTAL)	0.0759	MAC = 7	mg/L
SULFUR (TOTAL)	<3.0	N/A	mg/L
SULPHATE	7.2	AO ≤ 500	mg/L

TELLURIUM (TOTAL)	<0.0005	N/A	mg/L
THALLIUM (TOTAL)	<0.00002	N/A	mg/L
THORIUM (TOTAL)	<0.0001	N/A	mg/L
TIN (TOTAL)	<0.0002	N/A	mg/L
TITANIUM (TOTAL)	<0.005	N/A	mg/L
TOTAL DISSOLVED SOLIDS	58	AO ≤ 500	mg/L
TOTAL KJELDAHL NITROGEN	0.089	N/A	mg/L
TOTAL ORGANIC CARBON	2.51	N/A	mg/L
TUNGSTEN (TOTAL)	<0.001	N/A	mg/L
TURBIDITY	0.29	OG < 1	NTU
URANIUM (TOTAL)	0.000364	MAC = 0.02	mg/L
UV TRANSMITTANCE (UNFILTERED)	90.8	N/A	% T
VANADIUM (TOTAL)	<0.005	N/A	mg/L
ZINC (TOTAL)	<0.004	AO ≤ 5	mg/L
ZIRCONIUM (TOTAL)	<0.0001	N/A	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

APPENDIX H

2025 Monthly Reports

REGIONAL DISTRICT
NORTH OKANAGAN

Mabel Lake Water (MLW) Utility Water Quality Report for January 2025

The following is the water quality summary for the Mabel Lake Water Utility (MLW).

1. Source

The MLW system draws raw water from Mabel Lake through a screened intake line to a clear well. Water from the clear well is chlorinated and pumped into a 526 meter long pipe which provides chlorine contact time. Water then flows into the distribution system. Table 1 summarizes the results for bacterial and turbidity for the untreated water at the treatment plant.

Table 1 Mabel Lake Intake

Parameter	Laboratory		# of Samples	# of Deviations	Min	Max	Average
E.coli[3]	RDNO Lab	CFU/100 mL	5	-----	<1	<1	<1
Total Coliform	RDNO Lab	CFU/100 mL	5	-----	<1	4	1.2
Turbidity[2]	SCADA[1] Daily Average	NTU	31	-----	0.20	0.26	0.23
Turbidity[2]	Operator Grab Sample	NTU	13	-----	0.21	0.35	0.29
UVT (unfiltered)	RDNO Lab	%	5	-----	90.1	93.0	91.1

[1]SCADA: Supervisory Control and Data Acquisition.
[2]Operation Guideline: As outlined in Deviation Response Plan, turbidity < 1 NTU
[3]Drinking Water Treatment Objectives_ BC (Sec 4.3): Determine number of raw water samples with E. coli >20 CFU. The number of E. coli in raw water does not exceed 20/100 mL in at least 90% of the weekly samples from the previous six months.

2. Treatment Plant

MLW utilizes chlorine disinfection only. Table 2 summarizes chlorine and turbidity levels from the pipe that flow into the distribution system.

Table 2 Mabel Lake Water Treatment

Parameter	Laboratory		# of Samples	# of Deviations	Min	Max	Average
Free Chlorine[2]	SCADA[1] Daily Average	mg/L	31	-----	1.36	1.53	1.48

[1]SCADA: Supervisory Control and Data Acquisition.
[2]Operation Guideline: As outlined in Deviation Response Plan, free chlorine >0.20 mg/L and <2.20 mg/L; turbidity <1.0 NTU

3. Distribution

MLW provides potable water to 3 commercial and 373 residential connections. The majority of connected residents and all 3 commercial connections are seasonally occupied, with approximately 20 connections considered year-round or permanent. A Water System Capacity Assessment in 2025 estimated the population increases to an estimated three thousand one hundred and forty five (3145) persons during peak summer months.

Table 3 summarizes the results for chlorine, turbidity, and bacteria for the distribution system. The monthly water volume used at Mabel Lake this month was 3547 m^3.

Table 3 Mabel Lake Distribution Parameters

Parameter	Laboratory		# of Samples	# of Deviations	Min	Max	Average
Free Chlorine[1]	Operator Grab Sample	mg/L	37	-----	0.62	1.41	0.98
Total Chlorine	Operator Grab Sample	mg/L	37	-----	0.74	1.49	1.05
Turbidity[1]	Operator Grab Sample	NTU	37	-----	0.25	0.44	0.32
E.coli	RDNO Lab	MPN/100 mL	7	-----	<1	<1	<1
Total Coliform	RDNO Lab	MPN/100 mL	7	-----	<1	1[2]	<1

[1]Operation Guideline: As outlined in Deviation Response Plan, free chlorine >0.20 mg/L and <2.20 mg/L; turbidity <1.0 NTU
[2]Site was resampled and non detect was obtained.

4. Water Quality Customer Calls and Notifications

Customer calls within the Mabel Lake Water Utility service area are tracked and recorded.

There were no customer calls this month.

Table 4 Water Quality Customer Calls for the month

# of Calls	Type of Call	Issue/Inquiry	Investigation	Comments
-----	-----	-----	-----	-----

5. Operational or Maintenance Activity

Operational activities within the Mabel Lake Water service area are tracked and recorded.

There were no distribution operational activity this month.

Table 5 outlines the distribution operational and maintenance activities during the month.

Table 5 Monthly Operational Work and Maintenance

NUMBER OF LOCATIONS	TYPE OF WORK
0	Standpipe Maintenance
0	Water Service Locate
0	Water Main Break Repair
0	Water Meter Inspection
0	Water Meter Maintenance
0	Water Service Install
0	Water Service Repair
0	Water Turn On/Off
0	Water Curb Stop Repair
0	Water Investigation

REGIONAL DISTRICT
NORTH OKANAGAN

Mabel Lake Water (MLW) Utility Water Quality Report for February 2025

The following is the water quality summary for the Mabel Lake Water Utility (MLW).

On February 6, 2025, a Boil Water Notice and Water Service Interruption notice was issued due to a water main break and the subsequent lowering of water pressure in the immediate area to repair the break. The repair occurred on February 7, 2025 and the BWN was rescinded on February 13, 2025.

1. Source

The MLW system draws raw water from Mabel Lake through a screened intake line to a clear well. Water from the clear well is chlorinated and pumped into a 526 meter long pipe which provides chlorine contact time. Water then flows into the distribution system. Table 1 summarizes the results for bacterial and turbidity for the untreated water at the treatment plant.

Table 1 Mabel Lake Intake

Parameter	Laboratory		# of Samples	# of Deviations	Min	Max	Average
E.coli[3]	RDNO Lab	CFU/100 mL	4	-----	<1	<1	<1
Total Coliform	RDNO Lab	CFU/100 mL	4	-----	<1	1	<1
Turbidity[2]	SCADA[1] Daily Average	NTU	28	-----	0.19	0.23	0.21
Turbidity[2]	Operator Grab Sample	NTU	12	-----	0.18	0.28	0.23
UVT (unfiltered)	RDNO Lab	%	4	-----	90.1	91.5	91.0

[1]SCADA: Supervisory Control and Data Acquisition.
[2]Operation Guideline: As outlined in Deviation Response Plan, turbidity < 1 NTU
[3]Drinking Water Treatment Objectives_ BC (Sec 4.3): Determine number of raw water samples with E. coli >20 CFU. The number of E. coli in raw water does not exceed 20/100 mL in at least 90% of the weekly samples from the previous six months.

2. Treatment Plant

MLW utilizes chlorine disinfection only. Table 2 summarizes chlorine and turbidity levels from the pipe that flow into the distribution system.

Table 2 Mabel Lake Water Treatment

Parameter	Laboratory		# of Samples	# of Deviations	Min	Max	Average
Free Chlorine[2]	SCADA[1] Daily Average	mg/L	28	-----	1.48	1.63	1.52

[1]SCADA: Supervisory Control and Data Acquisition.
[2]Operation Guideline: As outlined in Deviation Response Plan, free chlorine >0.20 mg/L and <2.20 mg/L; turbidity <1.0 NTU

3. Distribution

MLW provides potable water to 3 commercial and 373 residential connections. The majority of connected residents and all 3 commercial connections are seasonally occupied, with approximately 20 connections considered year-round or permanent. A Water System Capacity Assessment in 2025 estimated the population increases to an estimated three thousand one hundred and forty five (3145) persons during peak summer months.

Table 3 summarizes the results for chlorine, turbidity, and bacteria for the distribution system. The monthly water volume used at Mabel Lake this month was 3520 m^3.

Table 3 Mabel Lake Distribution Parameters

Parameter	Laboratory		# of Samples	# of Deviations	Min	Max	Average
Free Chlorine[1]	Operator Grab Sample	mg/L	28	-----	0.47	1.51	1.03
Total Chlorine	Operator Grab Sample	mg/L	28	-----	0.53	1.58	1.11
Turbidity[1]	Operator Grab Sample	NTU	28	-----	0.13	0.40	0.24
E.coli	RDNO Lab	MPN/100 mL	8	-----	<1	<1	<1
Total Coliform	RDNO Lab	MPN/100 mL	8	-----	<1	<1	<1

[1]Operation Guideline: As outlined in Deviation Response Plan, free chlorine >0.20 mg/L and <2.20 mg/L; turbidity <1.0 NTU

4. Water Quality Customer Calls and Notifications

Customer calls within the Mabel Lake Water Utility service area are tracked and recorded.

There was 1 customer call this month.

Table 4 Water Quality Customer Calls for the month

# of Calls	Issue/Inquiry	Investigation	Comments
1	Issue	Water leaking from water main and flowing onto private property	Investigation determined that there was a water main leak. Customer did not water turned off at property overnight. Repaired the following day.

5. Operational or Maintenance Activity

Operational activities within the Mabel Lake Water service area are tracked and recorded.

There was 1 distribution operational activity this month.

Table 5 outlines the distribution operational and maintenance activities during the month.

Table 5 Monthly Operational Work and Maintenance

NUMBER OF LOCATIONS	TYPE OF WORK
0	Standpipe Maintenance
0	Water Service Locate
1	Water Main Break Repair
0	Water Meter Inspection
0	Water Meter Maintenance
0	Water Service Install
0	Water Service Repair
0	Water Turn On/Off
0	Water Curb Stop Repair
0	Water Investigation

REGIONAL DISTRICT
NORTH OKANAGAN

Mabel Lake Water (MLW) Utility Water Quality Report for March 2025

The following is the water quality summary for the Mabel Lake Water Utility (MLW).

1. Source

The MLW system draws raw water from Mabel Lake through a screened intake line to a clear well. Water from the clear well is chlorinated and pumped into a 526 meter long pipe which provides chlorine contact time. Water then flows into the distribution system. Table 1 summarizes the results for bacterial and turbidity for the untreated water at the treatment plant.

Table 1 Mabel Lake Intake

Parameter	Laboratory		# of Samples	# of Deviations	Min	Max	Average
E.coli[3]	RDNO Lab	CFU/100 mL	4	-----	<1	<1	<1
Total Coliform	RDNO Lab	CFU/100 mL	4	-----	<1	<1	<1
Turbidity[2]	SCADA[1] Daily Average	NTU	31	-----	0.19	0.29	0.22
Turbidity[2]	Operator Grab Sample	NTU	12	-----	0.21	0.30	0.25
UVT (unfiltered)	RDNO Lab	%	4	-----	91.2	91.8	91.6

[1]SCADA: Supervisory Control and Data Acquisition.
[2]Operation Guideline: As outlined in Deviation Response Plan, turbidity < 1 NTU
[3]Drinking Water Treatment Objectives_ BC (Sec 4.3): Determine number of raw water samples with E. coli >20 CFU. The number of E. coli in raw water does not exceed 20/100 mL in at least 90% of the weekly samples from the previous six months.

2. Treatment Plant

MLW utilizes chlorine disinfection only. Table 2 summarizes chlorine and turbidity levels from the pipe that flow into the distribution system.

Table 2 Mabel Lake Water Treatment

Parameter	Laboratory		# of Samples	# of Deviations	Min	Max	Average
Free Chlorine[2]	SCADA[1] Daily Average	mg/L	31	-----	1.45	1.54	1.50

[1]SCADA: Supervisory Control and Data Acquisition.
[2]Operation Guideline: As outlined in Deviation Response Plan, free chlorine >0.20 mg/L and <2.20 mg/L; turbidity <1.0 NTU

3. Distribution

MLW provides potable water to 3 commercial and 373 residential connections. The majority of connected residents and all 3 commercial connections are seasonally occupied, with approximately 20 connections considered year-round or permanent. A Water System Capacity Assessment in 2025 estimated the population increases to an estimated three thousand one hundred and forty five (3145) persons during peak summer months.

Table 3 summarizes the results for chlorine, turbidity, and bacteria for the distribution system. The monthly water volume used at Mabel Lake this month was 3338 m^3.

Table 3 Mabel Lake Distribution Parameters

Parameter	Laboratory		# of Samples	# of Deviations	Min	Max	Average
Free Chlorine[1]	Operator Grab Sample	mg/L	41	-----	0.48	1.30	0.95
Total Chlorine	Operator Grab Sample	mg/L	41	-----	0.52	1.37	1.01
Turbidity[1]	Operator Grab Sample	NTU	41	-----	0.20	0.36	0.27
E.coli	RDNO Lab	MPN/100 mL	4	-----	<1	<1	<1
Total Coliform	RDNO Lab	MPN/100 mL	4	-----	<1	<1	<1

[1]Operation Guideline: As outlined in Deviation Response Plan, free chlorine >0.20 mg/L and <2.20 mg/L; turbidity <1.0 NTU

4. Water Quality Customer Calls and Notifications

Customer calls within the Mabel Lake Water Utility service area are tracked and recorded.

There were 0 customer calls this month.

Table 4 Water Quality Customer Calls for the month

# of Calls	Issue/Inquiry	Investigation	Comments
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5. Operational or Maintenance Activity

Operational activities within the Mabel Lake Water service area are tracked and recorded in Table 5.

Table 5 Monthly Operational Work and Maintenance

NUMBER OF LOCATIONS	TYPE OF WORK
0	Standpipe Maintenance
0	Water Service Locate
0	Water Main Break Repair
0	Water Meter Inspection
0	Water Meter Maintenance
0	Water Service Install
0	Water Service Repair
0	Water Turn On/Off
0	Water Curb Stop Repair
0	Water Investigation

REGIONAL DISTRICT
NORTH OKANAGAN

Mabel Lake Water (MLW) Utility Water Quality Report for April 2025

The following is the water quality summary for the Mabel Lake Water Utility (MLW).

1. Source

The MLW system draws raw water from Mabel Lake through a screened intake line to a clear well. Water from the clear well is chlorinated and pumped into a 526 meter long pipe which provides chlorine contact time. Water then flows into the distribution system. Table 1 summarizes the results for bacterial and turbidity for the untreated water at the treatment plant.

Table 1 Mabel Lake Intake

Parameter	Laboratory		# of Samples	# of Deviations	Min	Max	Average
E.coli[3]	RDNO Lab	CFU/100 mL	5	-----	<1	<1	<1
Total Coliform	RDNO Lab	CFU/100 mL	5	-----	<1	1	<1
Turbidity[2]	SCADA[1] Daily Average	NTU	30	-----	0.17	2.51[4]	0.32
Turbidity[2]	Operator Grab Sample	NTU	13	-----	0.21	4.11[4]	0.60
UVT (unfiltered)	RDNO Lab	%	5	-----	90.0	91.7	90.9

[1]SCADA: Supervisory Control and Data Acquisition.
[2]Operation Guideline: As outlined in Deviation Response Plan, turbidity < 1 NTU
[3]Drinking Water Treatment Objectives_ BC (Sec 4.3): Determine number of raw water samples with E. coli >20 CFU. The number of E. coli in raw water does not exceed 20/100 mL in at least 90% of the weekly samples from the previous six months.
[4]Turbidity went over 1 NTU shortly after a Lakeshore Pump started. The SCADA system alarmed and shut down the pump. The operator went onsite to investigate. The pump was started back up and the turbidity quickly returned to < 1 NTU.

2. Treatment Plant

MLW utilizes chlorine disinfection only. Table 2 summarizes chlorine and turbidity levels from the pipe that flow into the distribution system.

Table 2 Mabel Lake Water Treatment

Parameter	Laboratory		# of Samples	# of Deviations	Min	Max	Average
Free Chlorine[2]	SCADA[1] Daily Average	mg/L	30	-----	1.45	1.65	1.55

[1]SCADA: Supervisory Control and Data Acquisition.
[2]Operation Guideline: As outlined in Deviation Response Plan, free chlorine >0.20 mg/L and <2.20 mg/L; turbidity <1.0 NTU

3. Distribution

MLW provides potable water to 3 commercial and 373 residential connections. The majority of connected residents and all 3 commercial connections are seasonally occupied, with approximately 20 connections considered year-round or permanent. A Water System Capacity Assessment in 2025 estimated the population increases to an estimated three thousand one hundred and forty five (3145) persons during peak summer months.

Table 3 summarizes the results for chlorine, turbidity, and bacteria for the distribution system. The monthly water volume used at Mabel Lake this month was 4936 m^3.

Table 3 Mabel Lake Distribution Parameters

Parameter	Laboratory		# of Samples	# of Deviations	Min	Max	Average
Free Chlorine[1]	Operator Grab Sample	mg/L	42	-----	0.63	1.29	0.98
Total Chlorine	Operator Grab Sample	mg/L	42	-----	0.70	1.43	1.07
Turbidity[1]	Operator Grab Sample	NTU	42	-----	0.20	0.72	0.35
E.coli	RDNO Lab	MPN/100 mL	5	-----	<1	<1	<1
Total Coliform	RDNO Lab	MPN/100 mL	5	-----	<1	<1	<1

[1]Operation Guideline: As outlined in Deviation Response Plan, free chlorine >0.20 mg/L and <2.20 mg/L; turbidity <1.0 NTU

4. Water Quality Customer Calls and Notifications

Customer calls within the Mabel Lake Water Utility service area are tracked and recorded.

There were two customer calls this month.

Table 4 Water Quality Customer Calls for the month

# of Calls	Issue/Inquiry	Investigation	Comments
1	Standpipe use	None	Community members wanting standpipes available to fill water trailers for fire protection.
1	Connection requirements to water and sewer	None	Response provided to customer on connection requirements.

5. Operational or Maintenance Activity

Operational activities within the Mabel Lake Water service area are tracked and recorded in Table 5.

Table 5 Monthly Operational Work and Maintenance

NUMBER OF LOCATIONS	TYPE OF WORK
0	Standpipe Maintenance
0	Water Service Locate
0	Water Main Break Repair
0	Water Meter Inspection
0	Water Meter Maintenance
0	Water Service Install
0	Water Service Repair
0	Water Turn On/Off
0	Water Curb Stop Repair
0	Water Investigation

REGIONAL DISTRICT
NORTH OKANAGAN

Mabel Lake Water (MLW) Utility Water Quality Report for May 2025

The following is the water quality summary for the Mabel Lake Water Utility (MLW).

1. Source

The MLW system draws raw water from Mabel Lake through a screened intake line to a clear well. Water from the clear well is chlorinated and pumped into a 526-meter-long pipe which provides chlorine contact time. Water then flows into the distribution system. Table 1 summarizes the results for bacterial and turbidity for the untreated water at the treatment plant.

Table 1 Mabel Lake Intake

Parameter	Laboratory		# of Samples	# of Deviations	Min	Max	Average
E.coli[3]	RDNO Lab	CFU/100 mL	4	-----	<1	<1	<1
Total Coliform	RDNO Lab	CFU/100 mL	4	-----	<1	1	<1
Turbidity[2]	SCADA[1] Daily Average	NTU	31	-----	0.19	1.06[4]	0.29
Turbidity[2]	Operator Grab Sample	NTU	14	-----	0.24	0.53	0.36
UVT (unfiltered)	RDNO Lab	%	4	-----	89.8	91.6	90.6

[1]SCADA: Supervisory Control and Data Acquisition.
[2]Operation Guideline: As outlined in Deviation Response Plan, turbidity < 1 NTU
[3]Drinking Water Treatment Objectives_ BC (Sec 4.3): Determine number of raw water samples with E. coli >20 CFU. The number of E. coli in raw water does not exceed 20/100 mL in at least 90% of the weekly samples from the previous six months.
[4]Turbidity briefly went over 1 NTU on May 24 but was not > 1 NTU for a 24 hour period. Turbidity returned to < 1 NTU the following day.

2. Treatment Plant

MLW utilizes chlorine disinfection only. Table 2 summarizes chlorine and turbidity levels from the pipe that flows into the distribution system.

Table 2 Mabel Lake Water Treatment

Parameter	Laboratory		# of Samples	# of Deviations	Min	Max	Average
Free Chlorine[2]	SCADA[1] Daily Average	mg/L	31	-----	1.48	1.68	1.62

[1]SCADA: Supervisory Control and Data Acquisition.
[2]Operation Guideline: As outlined in Deviation Response Plan, free chlorine >0.20 mg/L and <2.20 mg/L; turbidity <1.0 NTU

3. Distribution

MLW provides potable water to 3 commercial and 373 residential connections. The majority of connected residents and all 3 commercial connections are seasonally occupied, with approximately 20 connections considered year-round or permanent. A Water System Capacity Assessment in 2025 estimated the population increases to an estimated three thousand one hundred and forty-five (3145) persons during peak summer months.

Table 3 summarizes the results for chlorine, turbidity, and bacteria for the distribution system. The monthly water volume used at Mabel Lake this month was 7860 m^3.

Table 3 Mabel Lake Distribution Parameters

Parameter	Laboratory		# of Samples	# of Deviations	Min	Max	Average
Free Chlorine[1]	Operator Grab Sample	mg/L	45	-----	0.62	1.54	0.96
Total Chlorine	Operator Grab Sample	mg/L	45	-----	0.75	1.57	1.05
Turbidity[1]	Operator Grab Sample	NTU	45	-----	0.28	0.76	0.39
E.coli	RDNO Lab	MPN/100 mL	8	-----	<1	<1	<1
Total Coliform	RDNO Lab	MPN/100 mL	8	-----	<1	<1	<1

[1]Operation Guideline: As outlined in Deviation Response Plan, free chlorine >0.20 mg/L and <2.20 mg/L; turbidity <1.0 NTU

4. Water Quality Customer Calls and Notifications

Customer calls within the Mabel Lake Water Utility service area are tracked and recorded.

There were three customer calls this month.

Table 4 Water Quality Customer Calls for the month

# of Calls	Issue/Inquiry	Investigation	Comments
1	Customer inquiry about work happening around the Mid Reservoir	None	Customer was told MLW was working on clearing brush away to fire smart the area and maintain the water infrastructure.
1	Standpipe could not be operated	Yes	Operator investigated and determined standpipe needed maintenance.
1	Annual Bill	None	Customer enquiring about annual MLW bill.

5. Operational or Maintenance Activity

Operational activities within the Mabel Lake Water service area are tracked and recorded in Table 5.

Table 5 Monthly Operational Work and Maintenance

NUMBER OF LOCATIONS	TYPE OF WORK
1	Standpipe Maintenance
0	Water Service Locate
0	Water Main Break Repair
1	Water Service Install/Inspection
0	Water Turn On/Off
1	Water Service and/or Curb Stop Repair
1	Water Meter/ERT Install
2	Water Meter/ERT Inspection
0	Water Meter/ERT Maintenance
0	Water Meter/ERT Replacement
0	Water Meter Manual Read
0	Water Investigation
0	Reservoir Cleaning

REGIONAL DISTRICT
NORTH OKANAGAN

Mabel Lake Water (MLW) Utility Water Quality Report for June 2025

The following is the water quality summary for the Mabel Lake Water Utility (MLW).

1. Source

The MLW system draws raw water from Mabel Lake through a screened intake line to a clear well. Water from the clear well is chlorinated and pumped into a 526-meter-long pipe which provides chlorine contact time. Water then flows into the distribution system. Table 1 summarizes the results for bacterial and turbidity for the untreated water at the treatment plant.

Table 1 Mabel Lake Intake

Parameter	Laboratory		# of Samples	# of Deviations	Min	Max	Average
E.coli[3]	RDNO Lab	CFU/100 mL	4	-----	<1	1	<1
Total Coliform	RDNO Lab	CFU/100 mL	4	-----	1	5.1	2.8
Turbidity[2]	SCADA[1] Daily Average	NTU	30	-----	0.36	0.64	0.50
Turbidity[2]	Operator Grab Sample	NTU	12	-----	0.34	0.76	0.59
UVT (unfiltered)	RDNO Lab	%	4	-----	88.7	90.1	89.5

[1]SCADA: Supervisory Control and Data Acquisition.
[2]Operation Guideline: As outlined in Deviation Response Plan, turbidity < 1 NTU
[3]Drinking Water Treatment Objectives_ BC (Sec 4.3): Determine number of raw water samples with E. coli >20 CFU. The number of E. coli in raw water does not exceed 20/100 mL in at least 90% of the weekly samples from the previous six months.

2. Treatment Plant

MLW utilizes chlorine disinfection only. Table 2 summarizes chlorine and turbidity levels from the pipe that flows into the distribution system.

Table 2 Mabel Lake Water Treatment

Parameter	Laboratory		# of Samples	# of Deviations	Min	Max	Average
Free Chlorine[2]	SCADA[1] Daily Average	mg/L	30	-----	1.35	1.75	1.66

[1]SCADA: Supervisory Control and Data Acquisition.
[2]Operation Guideline: As outlined in Deviation Response Plan, free chlorine >0.20 mg/L and <2.20 mg/L; turbidity <1.0 NTU

3. Distribution

MLW provides potable water to 3 commercial and 373 residential connections. The majority of connected residents and all 3 commercial connections are seasonally occupied, with approximately 20 connections considered year-round or permanent. A Water System Capacity Assessment in 2025 estimated the population increases to an estimated three thousand one hundred and forty-five (3145) persons during peak summer months.

Table 3 summarizes the results for chlorine, turbidity, and bacteria for the distribution system. The monthly water volume used at Mabel Lake this month was 12027 m^3.

Table 3 Mabel Lake Distribution Parameters

Parameter	Laboratory		# of Samples	# of Deviations	Min	Max	Average
Free Chlorine[1]	Operator Grab Sample	mg/L	41	-----	0.49	1.53	0.92
Total Chlorine	Operator Grab Sample	mg/L	41	-----	0.54	1.64	1.01
Turbidity[1]	Operator Grab Sample	NTU	41	-----	0.34	0.87	0.59
E.coli	RDNO Lab	MPN/100 mL	7	-----	<1	<1	<1
Total Coliform	RDNO Lab	MPN/100 mL	7	-----	<1	<1	<1

[1]Operation Guideline: As outlined in Deviation Response Plan, free chlorine >0.20 mg/L and <2.20 mg/L; turbidity <1.0 NTU

4. Water Quality Customer Calls and Notifications

Customer calls within the Mabel Lake Water Utility service area are tracked and recorded.

There were seven customer calls this month.

Table 4 Water Quality Customer Calls for the month

# of Calls	Issue/Inquiry	Investigation	Comments
5	Universal Metering Enquiry	None	RDNO spoke with the customer explaining the letter.
1	Leaking Standpipe	Yes	Operator repaired standpipe when next onsite.
1	Connection Fee and Water Bill Enquiry	None	Customer enquiring about connection fees and annual MLW bill.

5. Operational or Maintenance Activity

Operational activities within the Mabel Lake Water service area are tracked and recorded in Table 5. There were seven operational activities this month.

Table 5 Monthly Operational Work and Maintenance

NUMBER OF LOCATIONS	TYPE OF WORK
6	Standpipe Maintenance
0	Water Service Locate
0	Water Main Break Repair
0	Water Service Install/Inspection
0	Water Turn On/Off
0	Water Service and/or Curb Stop Repair
1	Water Meter/ERT Install
0	Water Meter/ERT Inspection
0	Water Meter/ERT Maintenance
0	Water Meter/ERT Replacement
0	Water Meter Manual Read
0	Water Investigation
0	Reservoir Cleaning

REGIONAL DISTRICT
NORTH OKANAGAN

Mabel Lake Water (MLW) Utility Water Quality Report for July 2025

The following is the water quality summary for the Mabel Lake Water Utility (MLW).

1. Source

The MLW system draws raw water from Mabel Lake through a screened intake line to a clear well. Water from the clear well is chlorinated and pumped into a 526-meter-long pipe which provides chlorine contact time. Water then flows into the distribution system. Table 1 summarizes the results for bacterial and turbidity for the untreated water at the treatment plant.

Table 1 Mabel Lake Intake

Parameter	Laboratory		# of Samples	# of Deviations	Min	Max	Average
E.coli[3]	RDNO Lab	CFU/100 mL	5	-----	<1	2	<1
Total Coliform	RDNO Lab	CFU/100 mL	5	-----	<1	4.1	1.7
Turbidity[2]	SCADA[1] Daily Average	NTU	31	-----	0.23	0.49	0.31
Turbidity[2]	Operator Grab Sample	NTU	13	-----	0.31	0.63	0.44
UVT (unfiltered)	RDNO Lab	%	5	-----	89.3	91.3	90.0

[1]SCADA: Supervisory Control and Data Acquisition.
[2]Operation Guideline: As outlined in Deviation Response Plan, turbidity < 1 NTU
[3]Drinking Water Treatment Objectives_ BC (Sec 4.3): Determine number of raw water samples with E. coli >20 CFU. The number of E. coli in raw water does not exceed 20/100 mL in at least 90% of the weekly samples from the previous six months.

2. Treatment Plant

MLW utilizes chlorine disinfection only. Table 2 summarizes chlorine and turbidity levels from the pipe that flows into the distribution system.

Table 2 Mabel Lake Water Treatment

Parameter	Laboratory		# of Samples	# of Deviations	Min	Max	Average
Free Chlorine[2]	SCADA[1] Daily Average	mg/L	31	-----	1.53	1.76	1.71

[1]SCADA: Supervisory Control and Data Acquisition.
[2]Operation Guideline: As outlined in Deviation Response Plan, free chlorine >0.20 mg/L and <2.20 mg/L; turbidity <1.0 NTU

3. Distribution

MLW provides potable water to 3 commercial and 373 residential connections. The majority of connected residents and all 3 commercial connections are seasonally occupied, with approximately 20 connections considered year-round or permanent. A Water System Capacity Assessment in 2025 estimated the population increases to an estimated three thousand one hundred and forty-five (3145) persons during peak summer months.

Table 3 summarizes the results for chlorine, turbidity, and bacteria for the distribution system. The monthly water volume used at Mabel Lake this month was 14996 m^3.

Table 3 Mabel Lake Distribution Parameters

Parameter	Laboratory		# of Samples	# of Deviations	Min	Max	Average
Free Chlorine[1]	Operator Grab Sample	mg/L	45	-----	0.67	1.62	1.01
Total Chlorine	Operator Grab Sample	mg/L	45	-----	0.75	1.71	1.09
Turbidity[1]	Operator Grab Sample	NTU	45	-----	0.35	0.81	0.52
E.coli	RDNO Lab	MPN/100 mL	10	-----	<1	<1	<1
Total Coliform	RDNO Lab	MPN/100 mL	10	-----	<1	<1	<1

[1]Operation Guideline: As outlined in Deviation Response Plan, free chlorine >0.20 mg/L and <2.20 mg/L; turbidity <1.0 NTU

4. Water Quality Customer Calls and Notifications

Customer calls within the Mabel Lake Water Utility service area are tracked and recorded.

There were seven customer calls this month.

Table 4 Water Quality Customer Calls for the month

# of Calls	Issue/Inquiry	Investigation	Comments
1	New light at Booster Station was impacting neighbors	None	RDNO installed motion activated light instead
3	Universal Metering Inquiry	None	RDNO spoke with customer to explain the letter

5. Operational or Maintenance Activity

Operational activities within the Mabel Lake Water service area are tracked and recorded in Table 5. There were four operational activities this month.

Table 5 Monthly Operational Work and Maintenance

NUMBER OF LOCATIONS	TYPE OF WORK
0	Standpipe Maintenance
0	Water Service Locate
0	Water Main Break Repair
1	Water Service Install/Inspection
1	Water Turn On/Off
0	Water Service and/or Curb Stop Repair
2	Water Meter/ERT Install
0	Water Meter/ERT Inspection
0	Water Meter/ERT Maintenance
0	Water Meter/ERT Replacement
0	Water Meter Manual Read
0	Water Investigation
0	Reservoir Cleaning

REGIONAL DISTRICT
NORTH OKANAGAN

Mabel Lake Water (MLW) Utility Water Quality Report for August 2025

The following is the water quality summary for the Mabel Lake Water Utility (MLW).

1. Source

The MLW system draws raw water from Mabel Lake through a screened intake line to a clear well. Water from the clear well is chlorinated and pumped into a 526-meter-long pipe which provides chlorine contact time. Water then flows into the distribution system. Table 1 summarizes the results for bacterial and turbidity for the untreated water at the treatment plant.

Table 1 Mabel Lake Intake

Parameter	Laboratory		# of Samples	# of Deviations	Min	Max	Average
E.coli[3]	RDNO Lab	CFU/100 mL	4	-----	<1	<1	<1
Total Coliform	RDNO Lab	CFU/100 mL	4	-----	4.1	37.4	13.6
Turbidity[2]	SCADA[1] Daily Average	NTU	31	-----	0.21	0.48	0.25
Turbidity[2]	Operator Grab Sample	NTU	12	-----	0.29	0.57	0.41
UVT (unfiltered)	RDNO Lab	%	4	-----	89.1	90.6	89.7

[1]SCADA: Supervisory Control and Data Acquisition.
[2]Operation Guideline: As outlined in Deviation Response Plan, turbidity < 1 NTU
[3]Drinking Water Treatment Objectives_ BC (Sec 4.3): Determine number of raw water samples with E. coli >20 CFU. The number of E. coli in raw water does not exceed 20/100 mL in at least 90% of the weekly samples from the previous six months.

2. Treatment Plant

MLW utilizes chlorine disinfection only. Table 2 summarizes chlorine and turbidity levels from the pipe that flows into the distribution system.

Table 2 Mabel Lake Water Treatment

Parameter	Laboratory		# of Samples	# of Deviations	Min	Max	Average
Free Chlorine[2]	SCADA[1] Daily Average	mg/L	31	-----	1.58	1.74	1.69

[1]SCADA: Supervisory Control and Data Acquisition.
[2]Operation Guideline: As outlined in Deviation Response Plan, free chlorine >0.20 mg/L and <2.20 mg/L; turbidity <1.0 NTU

3. Distribution

MLW provides potable water to 3 commercial and 373 residential connections. The majority of connected residents and all 3 commercial connections are seasonally occupied, with approximately 20 connections considered year-round or permanent. A Water System Capacity Assessment in 2025 estimated the population increases to an estimated three thousand one hundred and forty-five (3145) persons during peak summer months.

Table 3 summarizes the results for chlorine, turbidity, and bacteria for the distribution system. The monthly water volume used at Mabel Lake this month was 13,557 m^3.

Table 3 Mabel Lake Distribution Parameters

Parameter	Laboratory		# of Samples	# of Deviations	Min	Max	Average
Free Chlorine[1]	Operator Grab Sample	mg/L	41	-----	0.64	1.47	0.92
Total Chlorine	Operator Grab Sample	mg/L	41	-----	0.69	1.58	1.01
Turbidity[1]	Operator Grab Sample	NTU	41	-----	0.25	0.77	0.50
E.coli	RDNO Lab	MPN/100 mL	8	-----	<1	<1	<1
Total Coliform	RDNO Lab	MPN/100 mL	8	-----	<1	<1	<1

[1]Operation Guideline: As outlined in Deviation Response Plan, free chlorine >0.20 mg/L and <2.20 mg/L; turbidity <1.0 NTU

4. Water Quality Customer Calls and Notifications

Customer calls within the Mabel Lake Water Utility service area are tracked and recorded.

There were seven customer calls this month.

Table 4 Water Quality Customer Calls for the month

# of Calls	Issue/Inquiry	Investigation	Comments
1	Filter clogged in house and poor water quality	Yes	Flushed area and collected samples. Samples showed an improvement in water quality after flushing.
1	Water Quality and filter clogged	Yes	Flushed area and collected samples. Samples showed an improvement in water quality after flushing.

5. Operational or Maintenance Activity

Operational activities within the Mabel Lake Water service area are tracked and recorded in Table 5. There were 5 operational activities this month.

Table 5 Monthly Operational Work and Maintenance

NUMBER OF LOCATIONS	TYPE OF WORK
0	Standpipe Maintenance
0	Water Service Locate
0	Water Main Break Repair
0	Water Service Install/Inspection
0	Water Turn On/Off
0	Water Service and/or Curb Stop Repair
4	Water Meter/ERT Install
0	Water Meter/ERT Inspection
0	Water Meter/ERT Maintenance
0	Water Meter/ERT Replacement
0	Water Meter Manual Read
0	Water Investigation
0	Reservoir Cleaning
1	Facilities Maintenance

REGIONAL DISTRICT
NORTH OKANAGAN

Mabel Lake Water (MLW) Utility Water Quality Report for September 2025

The following is the water quality summary for the Mabel Lake Water Utility (MLW).

1. Source

The MLW system draws raw water from Mabel Lake through a screened intake line to a clear well. Water from the clear well is chlorinated and pumped into a 526-meter-long pipe which provides chlorine contact time. Water then flows into the distribution system. Table 1 summarizes the results for bacterial and turbidity for the untreated water at the treatment plant.

Table 1 Mabel Lake Intake

Parameter	Laboratory		# of Samples	# of Deviations	Min	Max	Average
E.coli[3]	RDNO Lab	CFU/100 mL	4	-----	<1	<1	<1
Total Coliform	RDNO Lab	CFU/100 mL	4	-----	1	55.4	18.4
Turbidity[2]	SCADA[1] Daily Average	NTU	30	-----	0.25	0.37	0.30
Turbidity[2]	Operator Grab Sample	NTU	12	-----	0.37	0.74	0.48
UVT (unfiltered)	RDNO Lab	%	4	-----	89.2	91.6	90.5

[1]SCADA: Supervisory Control and Data Acquisition.
[2]Operation Guideline: As outlined in Deviation Response Plan, turbidity < 1 NTU
[3]Drinking Water Treatment Objectives_ BC (Sec 4.3): Determine number of raw water samples with E. coli >20 CFU. The number of E. coli in raw water does not exceed 20/100 mL in at least 90% of the weekly samples from the previous six months.

2. Treatment Plant

MLW utilizes chlorine disinfection only. Table 2 summarizes chlorine and turbidity levels from the pipe that flows into the distribution system.

Table 2 Mabel Lake Water Treatment

Parameter	Laboratory		# of Samples	# of Deviations	Min	Max	Average
Free Chlorine[2]	SCADA[1] Daily Average	mg/L	30	-----	1.57	1.73	1.65

[1]SCADA: Supervisory Control and Data Acquisition.
[2]Operation Guideline: As outlined in Deviation Response Plan, free chlorine >0.20 mg/L and <2.20 mg/L; turbidity <1.0 NTU

3. Distribution

MLW provides potable water to 3 commercial and 373 residential connections. The majority of connected residents and all 3 commercial connections are seasonally occupied, with approximately 20 connections considered year-round or permanent. A Water System Capacity Assessment in 2025 estimated the population increases to an estimated three thousand one hundred and forty-five (3145) persons during peak summer months.

Table 3 summarizes the results for chlorine, turbidity, and bacteria for the distribution system. The monthly water volume used at Mabel Lake this month was 10,121 m^3.

Table 3 Mabel Lake Distribution Parameters

Parameter	Laboratory		# of Samples	# of Deviations	Min	Max	Average
Free Chlorine[1]	Operator Grab Sample	mg/L	41	-----	0.59	1.44	0.88
Total Chlorine	Operator Grab Sample	mg/L	41	-----	0.64	1.51	0.97
Turbidity[1]	Operator Grab Sample	NTU	41	-----	0.22	0.68	0.41
E.coli	RDNO Lab	MPN/100 mL	8	-----	<1	<1	<1
Total Coliform	RDNO Lab	MPN/100 mL	8	-----	<1	<1	<1

[1]Operation Guideline: As outlined in Deviation Response Plan, free chlorine >0.20 mg/L and <2.20 mg/L; turbidity <1.0 NTU

4. Water Quality Customer Calls and Notifications

Customer calls within the Mabel Lake Water Utility service area are tracked and recorded.

There were three customer calls this month.

Table 4 Water Quality Customer Calls for the month

# of Calls	Issue/Inquiry	Investigation	Comments
2	Customers would like to be part of meter installation program	None	Customers were added to the meter installation schedule
1	Customer noted they had low pressure and loss of water during peak flow period	No	The customer is in a low-pressure area and shares a service with their neighbor. Customer can install separate service if they wish.

5. Operational or Maintenance Activity

Operational activities within the Mabel Lake Water service area are tracked and recorded in Table 5. There were sixteen operational activities this month.

Table 5 Monthly Operational Work and Maintenance

NUMBER OF LOCATIONS	TYPE OF WORK
0	Standpipe Maintenance
0	Water Service Locate
0	Water Main Break Repair
0	Water Service Install/Inspection
0	Water Turn On/Off
0	Water Service and/or Curb Stop Repair
16	Water Meter/ERT Install
0	Water Meter/ERT Inspection
0	Water Meter/ERT Maintenance
0	Water Meter/ERT Replacement
0	Water Meter Manual Read
0	Water Investigation
0	Reservoir Cleaning
0	Facilities Maintenance

REGIONAL DISTRICT
NORTH OKANAGAN

Mabel Lake Water (MLW) Utility Water Quality Report for October 2025

The following is the water quality summary for the Mabel Lake Water Utility (MLW).

1. Source

The MLW system draws raw water from Mabel Lake through a screened intake line to a clear well. Water from the clear well is chlorinated and pumped into a 526-meter-long pipe which provides chlorine contact time. Water then flows into the distribution system. Table 1 summarizes the results for bacterial and turbidity for the untreated water at the treatment plant.

Table 1 Mabel Lake Intake

Parameter	Laboratory		# of Samples	# of Deviations	Min	Max	Average
E.coli[3]	RDNO Lab	CFU/100 mL	5	-----	<1	<10	<1
Total Coliform	RDNO Lab	CFU/100 mL	5	-----	<1	727	312.7
Turbidity[2]	SCADA[1] Daily Average	NTU	31	-----	0.21	0.32	0.24
Turbidity[2]	Operator Grab Sample	NTU	12	-----	0.25	0.60	0.36
UVT (unfiltered)	RDNO Lab	%	5	-----	89.9	90.8	90.3

[1]SCADA: Supervisory Control and Data Acquisition.
[2]Operation Guideline: As outlined in Deviation Response Plan, turbidity < 1 NTU
[3]Drinking Water Treatment Objectives_ BC (Sec 4.3): Determine number of raw water samples with E. coli >20 CFU. The number of E. coli in raw water does not exceed 20/100 mL in at least 90% of the weekly samples from the previous six months.

2. Treatment Plant

MLW utilizes chlorine disinfection only. Table 2 summarizes chlorine and turbidity levels from the pipe that flows into the distribution system.

Table 2 Mabel Lake Water Treatment

Parameter	Laboratory		# of Samples	# of Deviations	Min	Max	Average
Free Chlorine[2]	SCADA[1] Daily Average	mg/L	31	-----	1.50	1.64	1.55

[1]SCADA: Supervisory Control and Data Acquisition.
[2]Operation Guideline: As outlined in Deviation Response Plan, free chlorine >0.20 mg/L and <2.20 mg/L; turbidity <1.0 NTU

3. Distribution

MLW provides potable water to 3 commercial and 373 residential connections. The majority of connected residents and all 3 commercial connections are seasonally occupied, with approximately 20 connections considered year-round or permanent. A Water System Capacity Assessment in 2025 estimated the population increases to an estimated three thousand one hundred and forty-five (3145) persons during peak summer months.

Table 3 summarizes the results for chlorine, turbidity, and bacteria for the distribution system. The monthly water volume used at Mabel Lake this month was 5556 m^3.

Table 3 Mabel Lake Distribution Parameters

Parameter	Laboratory		# of Samples	# of Deviations	Min	Max	Average
Free Chlorine[1]	Operator Grab Sample	mg/L	45	-----	0.27	1.10	0.65
Total Chlorine	Operator Grab Sample	mg/L	45	-----	0.31	1.16	0.71
Turbidity[1]	Operator Grab Sample	NTU	45	-----	0.24	0.60	0.38
E.coli	RDNO Lab	MPN/100 mL	5	-----	<1	<1	<1
Total Coliform	RDNO Lab	MPN/100 mL	5	-----	<1	<1	<1

[1]Operation Guideline: As outlined in Deviation Response Plan, free chlorine >0.20 mg/L and <2.20 mg/L; turbidity <1.0 NTU

4. Water Quality Customer Calls and Notifications

Customer calls within the Mabel Lake Water Utility service area are tracked and recorded.

There were five customer calls this month and two RDNO initiated activities.

Table 4 Water Quality Customer Calls for the month

# of Calls	Issue/Inquiry	Investigation	Comments
2	Customers would like to be part of meter installation program	No	Customers were added to the meter installation schedule for 2026
1	Customer inquiring about private curb stop after meter pit installation	No	It was confirmed that private curb stop was still in place after meter installation.
1	Customer concerned that newly installed meters will freeze and a property's curb stop is not accessible	No	Additional insulation is being added to prevent freezing. An operator was dispatched to investigate the curb stop.
1	Customer inquired about water and sewer connection requirements	No	Current water and sewer connection fees were provided with water and sewer connection requirements.
1	Illegal water connection	Yes	Investigating water connection
1	Illegal water and sewer connection	Yes	Investigating water and sewer connections

5. Operational or Maintenance Activity

Operational activities within the Mabel Lake Water service area are tracked and recorded in Table 5. There were 18 operational activities this month.

Table 5 Monthly Operational Work and Maintenance

NUMBER OF LOCATIONS	TYPE OF WORK
0	Standpipe Maintenance
0	Water Service Locate
0	Water Main Break Repair
0	Water Service Install/Inspection
0	Water Turn On/Off
1	Water Service and/or Curb Stop Repair
17	Water Meter/ERT Install
0	Water Meter/ERT Inspection
0	Water Meter/ERT Maintenance
0	Water Meter/ERT Replacement
0	Water Meter Manual Read
0	Water Investigation
0	Reservoir Cleaning
0	Facilities Maintenance

REGIONAL DISTRICT
NORTH OKANAGAN

Mabel Lake Water (MLW) Utility Water Quality Report for November 2025

The following is the water quality summary for the Mabel Lake Water Utility (MLW).

1. Source

The MLW system draws raw water from Mabel Lake through a screened intake line to a clear well. Water from the clear well is chlorinated and pumped into a 526-meter-long pipe which provides chlorine contact time. Water then flows into the distribution system. Table 1 summarizes the results for bacterial and turbidity for the untreated water at the treatment plant.

Table 1 Mabel Lake Intake

Parameter	Laboratory		# of Samples	# of Deviations	Min	Max	Average
E.coli[3]	RDNO Lab	CFU/100 mL	4	-----	<1	<1	<1
Total Coliform	RDNO Lab	CFU/100 mL	4	-----	<1	6.3	2.0
Turbidity[2]	SCADA[1] Daily Average	NTU	30	-----	0.20	0.23	0.22
Turbidity[2]	Operator Grab Sample	NTU	13	-----	0.13	0.30	0.24
UVT (unfiltered)	RDNO Lab	%	4	-----	90.6	91.8	91.4

[1]SCADA: Supervisory Control and Data Acquisition.
[2]Operation Guideline: As outlined in Deviation Response Plan, turbidity < 1 NTU
[3]Drinking Water Treatment Objectives_ BC (Sec 4.3): Determine number of raw water samples with E. coli >20 CFU. The number of E. coli in raw water does not exceed 20/100 mL in at least 90% of the weekly samples from the previous six months.

2. Treatment Plant

MLW utilizes chlorine disinfection only. Table 2 summarizes chlorine and turbidity levels from the pipe that flows into the distribution system.

Table 2 Mabel Lake Water Treatment

Parameter	Laboratory		# of Samples	# of Deviations	Min	Max	Average
Free Chlorine[2]	SCADA[1] Daily Average	mg/L	30	-----	1.05	1.59	1.50

[1]SCADA: Supervisory Control and Data Acquisition.
[2]Operation Guideline: As outlined in Deviation Response Plan, free chlorine >0.20 mg/L and <2.20 mg/L; turbidity <1.0 NTU

3. Distribution

MLW provides potable water to 3 commercial and 373 residential connections. The majority of connected residents and all 3 commercial connections are seasonally occupied, with approximately 20 connections considered year-round or permanent. A Water System Capacity Assessment in 2025 estimated the population increases to an estimated three thousand one hundred and forty-five (3145) persons during peak summer months.

Table 3 summarizes the results for chlorine, turbidity, and bacteria for the distribution system. The monthly water volume used at Mabel Lake this month was 4225 m^3.

Table 3 Mabel Lake Distribution Parameters

Parameter	Laboratory		# of Samples	# of Deviations	Min	Max	Average
Free Chlorine[1]	Operator Grab Sample	mg/L	40	-----	0.37	1.24	0.81
Total Chlorine	Operator Grab Sample	mg/L	40	-----	0.42	1.39	0.90
Turbidity[1]	Operator Grab Sample	NTU	40	-----	0.09	0.37	0.26
E.coli	RDNO Lab	MPN/100 mL	4	-----	<1	<1	<1
Total Coliform	RDNO Lab	MPN/100 mL	4	-----	<1	<1	<1

[1]Operation Guideline: As outlined in Deviation Response Plan, free chlorine >0.20 mg/L and <2.20 mg/L; turbidity <1.0 NTU

4. Water Quality Customer Calls and Notifications

Customer calls within the Mabel Lake Water Utility service area are tracked and recorded.

There were three customer calls this month.

Table 4 Water Quality Customer Calls for the month

# of Calls	Issue/Inquiry	Investigation	Comments
1	Customer inquiring about connection requirements and cost	No	The customer was supplied with instruction on forms to submit and the associated cost of those applications.
1	Water leak in house	Yes	RDNO investigated and determined it was internal plumbing. It was recommended that the homeowner call a plumber.

5. Operational or Maintenance Activity

Operational activities within the Mabel Lake Water service area are tracked and recorded in Table 5. There were 16 operational activities this month.

Table 5 Monthly Operational Work and Maintenance

NUMBER OF LOCATIONS	TYPE OF WORK
1	Standpipe Maintenance
0	Water Service Locate
0	Water Main Break Repair
0	Water Service Install/Inspection
1	Water Turn On/Off
3	Water Service and/or Curb Stop Repair
0	Water Meter/ERT Install
0	Water Meter/ERT Inspection
0	Water Meter/ERT Maintenance
0	Water Meter/ERT Replacement
0	Water Meter Manual Read
1	Water Investigation
0	Reservoir Cleaning
0	Facilities Maintenance

REGIONAL DISTRICT
NORTH OKANAGAN

Mabel Lake Water (MLW) Utility Water Quality Report for December 2025

The following is the water quality summary for the Mabel Lake Water Utility (MLW).

1. Source

The MLW system draws raw water from Mabel Lake through a screened intake line to a clear well. Water from the clear well is chlorinated and pumped into a 526-meter-long pipe which provides chlorine contact time. Water then flows into the distribution system. Table 1 summarizes the results for bacterial and turbidity for the untreated water at the treatment plant.

Table 1 Mabel Lake Intake

Parameter	Laboratory		# of Samples	# of Deviations	Min	Max	Average
E.coli[3]	RDNO Lab	CFU/100 mL	5	-----	<1	<1	<1
Total Coliform	RDNO Lab	CFU/100 mL	5	-----	<1	4.1	1.8
Turbidity[2]	SCADA[1] Daily Average	NTU	31	-----	0.19	0.32	0.22
Turbidity[2]	Operator Grab Sample	NTU	13	-----	0.23	0.37	0.29
UVT (unfiltered)	RDNO Lab	%	5	-----	90.5	92.7	91.0

[1]SCADA: Supervisory Control and Data Acquisition.
[2]Operation Guideline: As outlined in Deviation Response Plan, turbidity < 1 NTU
[3]Drinking Water Treatment Objectives_ BC (Sec 4.3): Determine number of raw water samples with E. coli >20 CFU. The number of E. coli in raw water does not exceed 20/100 mL in at least 90% of the weekly samples from the previous six months.

2. Treatment Plant

MLW utilizes chlorine disinfection only. Table 2 summarizes chlorine and turbidity levels from the pipe that flows into the distribution system.

Table 2 Mabel Lake Water Treatment

Parameter	Laboratory		# of Samples	# of Deviations	Min	Max	Average
Free Chlorine[2]	SCADA[1] Daily Average	mg/L	31	-----	1.08	1.54	1.48

[1]SCADA: Supervisory Control and Data Acquisition.
[2]Operation Guideline: As outlined in Deviation Response Plan, free chlorine >0.20 mg/L and <2.20 mg/L; turbidity <1.0 NTU

3. Distribution

MLW provides potable water to 3 commercial and 373 residential connections. The majority of connected residents and all 3 commercial connections are seasonally occupied, with approximately 20 connections considered year-round or permanent. A Water System Capacity Assessment in 2025 estimated the population increases to an estimated three thousand one hundred and forty-five (3145) persons during peak summer months.

Table 3 summarizes the results for chlorine, turbidity, and bacteria for the distribution system. The monthly water volume used at Mabel Lake this month was 4218 m^3.

Table 3 Mabel Lake Distribution Parameters

Parameter	Laboratory		# of Samples	# of Deviations	Min	Max	Average
Free Chlorine[1]	Operator Grab Sample	mg/L	41	-----	0.59	1.44	0.87
Total Chlorine	Operator Grab Sample	mg/L	41	-----	0.69	1.48	0.95
Turbidity[1]	Operator Grab Sample	NTU	41	-----	0.17	0.37	0.27
E.coli	RDNO Lab	MPN/100 mL	5	-----	<1	<1	<1
Total Coliform	RDNO Lab	MPN/100 mL	5	-----	<1	<1	<1

[1]Operation Guideline: As outlined in Deviation Response Plan, free chlorine >0.20 mg/L and <2.20 mg/L; turbidity <1.0 NTU

4. Water Quality Customer Calls and Notifications

Customer calls within the Mabel Lake Water Utility service area are tracked and recorded.

There were zero customer calls this month.

Table 4 Water Quality Customer Calls for the month

# of Calls	Issue/Inquiry	Investigation	Comments
	-----	-----	-----

5. Operational or Maintenance Activity

Operational activities within the Mabel Lake Water service area are tracked and recorded in Table 5. There were two operational activities this month.

Table 5 Monthly Operational Work and Maintenance

NUMBER OF LOCATIONS	TYPE OF WORK
0	Standpipe Maintenance
0	Water Service Locate
0	Water Main Break Repair
0	Water Service Install/Inspection
0	Water Turn On/Off
0	Water Service and/or Curb Stop Repair
2	Water Meter/ERT Install
0	Water Meter/ERT Inspection
0	Water Meter/ERT Maintenance
0	Water Meter/ERT Replacement
0	Water Meter Manual Read
0	Water Investigation
0	Reservoir Cleaning
0	Facilities Maintenance