

# Magic Lake Estates Water and Sewer System

2025 Annual Report

## CRD | Drinking Water and Wastewater

### Introduction

This report provides a summary of the Magic Lake Estates (MLE) Water and Sewer Service for 2025 and provides a description of the water and sewer services including: summary of the water supply, demand and production, drinking water quality, wastewater treatment flows, effluent quality, operations highlights, capital project updates and financial report.

### WATER SYSTEM

#### Water Service Description

The community of Magic Lake Estates is primarily a rural residential development with some community properties located on Pender Island in the Southern Gulf Islands Electoral Area which was originally serviced by a private water utility and in 1981 the service converted to the Capital Regional District (CRD). The Magic Lake Estates water service is made up of 1,196 parcels, of which there are 1,082 single family equivalents (or approximately the same number of customers) obtaining service from the water system.

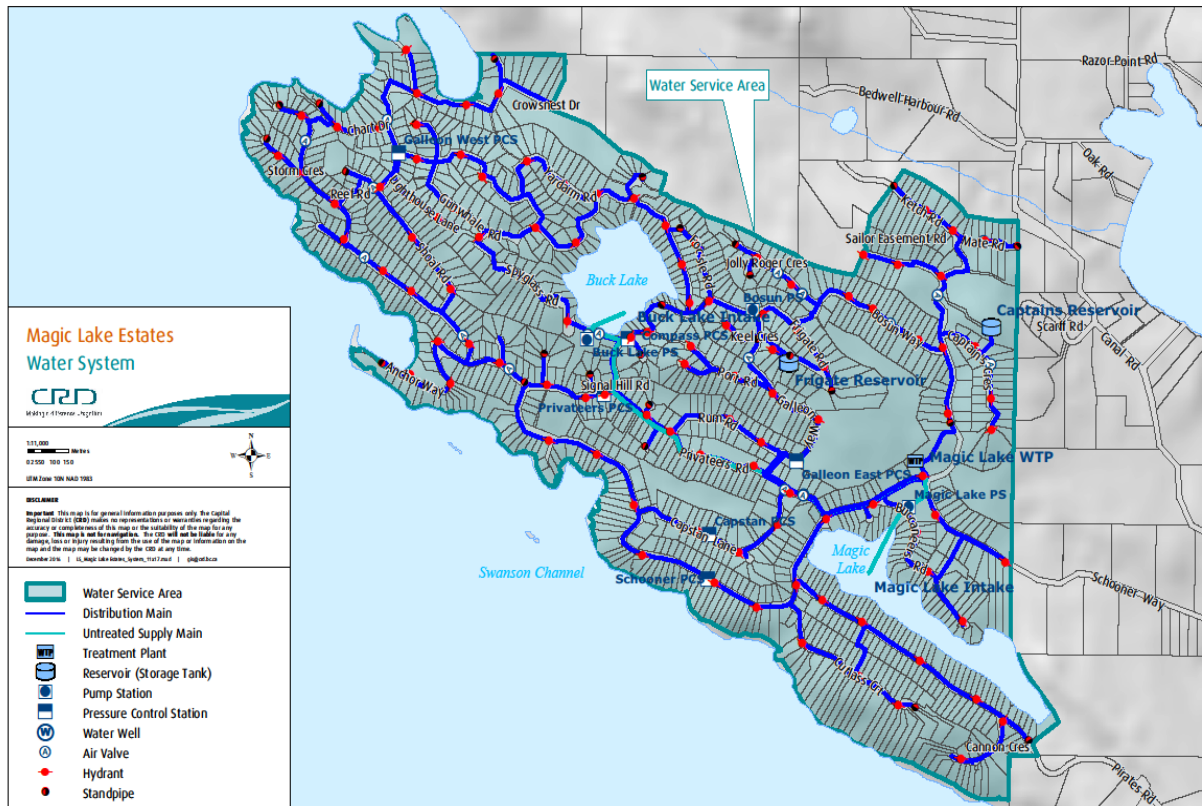


Figure 1: Map of Magic Lake Estates Water System

The Magic Lake Estates water system is primarily comprised of:

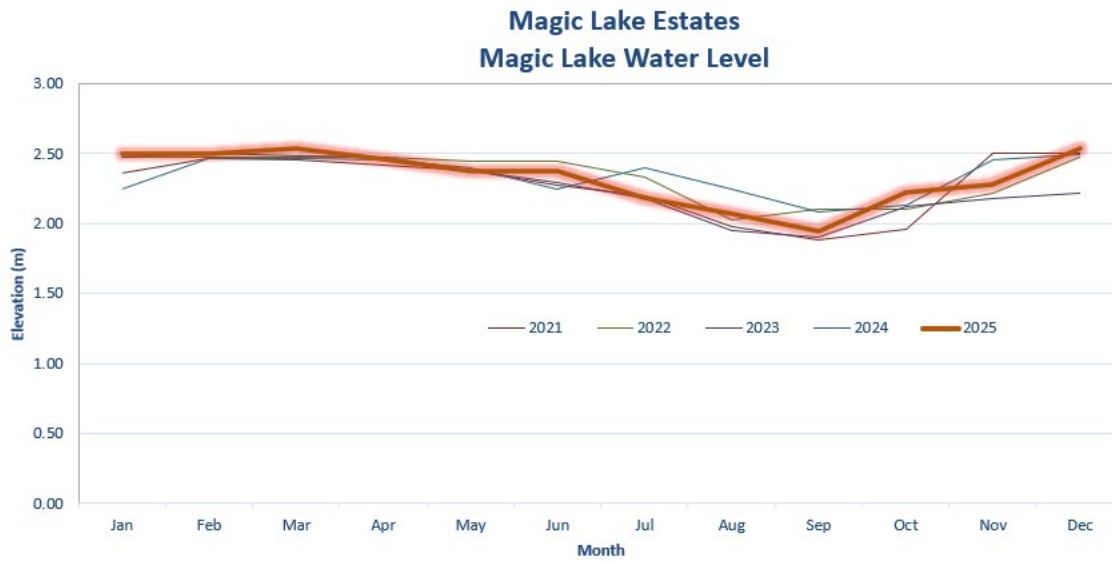
- Two raw water sources; Buck Lake (primary source) and Magic Lake (secondary source).
- Four earthen dam structures (two at Buck Lake and two at Magic Lake).
- Two raw water pump stations, one each related to the raw water supplies, with pretreatment oxidation equipment to treat and control dissolved manganese and iron in the raw water source.
- Centralized water treatment plant consisting of a dual process including dissolved air flotation (DAF), filtration, ultraviolet light disinfection, and chlorine disinfection.
- One booster pump station / pressure reducing station (Bosun).
- Two steel storage tanks, Frigate and Captains (volumes: Frigate 750 cubic metres or 200,000 USg and Captains 341 cubic metres or 90,000 USg).
- Supervisory Control and Data Acquisition (SCADA) system.
- Distribution system and supply pipe network (more than 27 kilometres of water mains).
- Other water system assets: 1082 water service connections and metres, approximately 70 fire hydrants, six pressure reducing valve stations, 100 gate valves and standpipes.

## Water Supply

Surface water supply monthly water levels are provided in Figures 2 and 3 for Buck Lake and Magic Lake, respectively. It is important to note that under normal operating conditions, Buck Lake provides 80% and Magic Lake provides 20% of the annual raw water demand for the service. However, in 2025, due to an algae event in Magic Lake, Buck Lake provided 100% of the raw water supply from August through November.



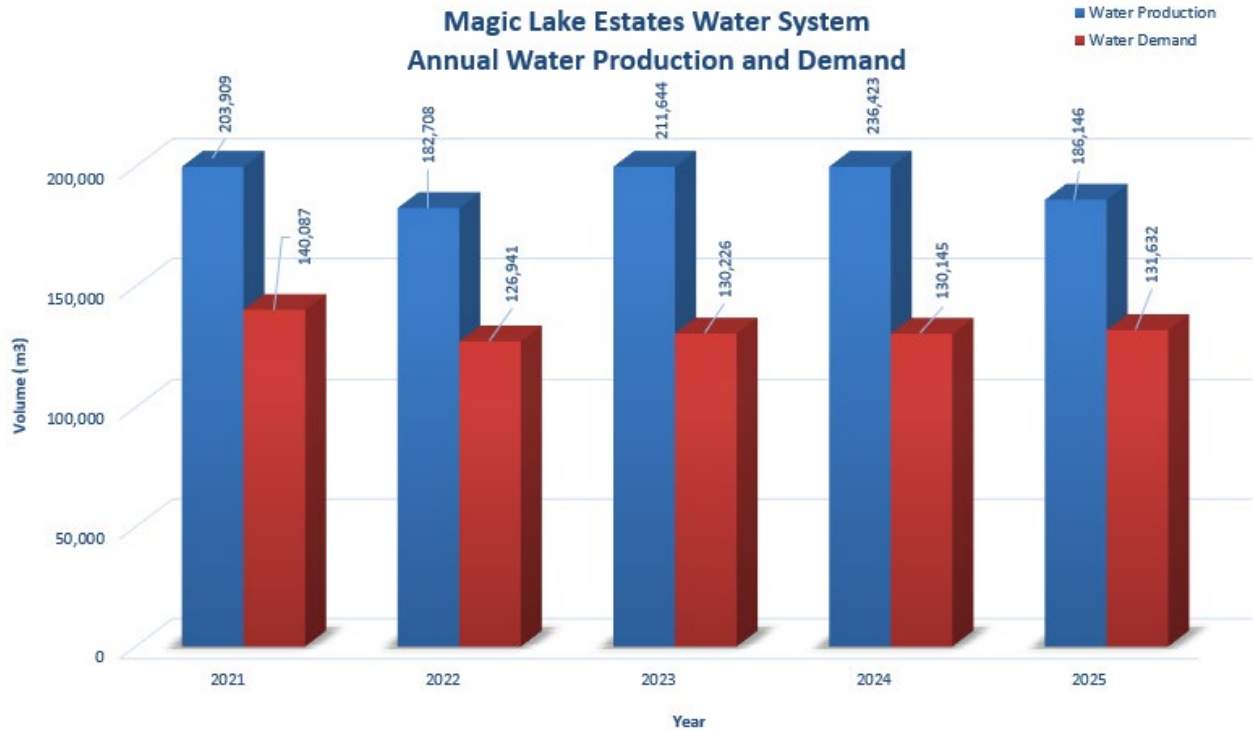
**Figure 2: Buck Lake Monthly Water Level**



**Figure 3: Magic Lake Monthly Water Level**

### Water Production and Demand

Referring to Figure 4, 186,146 cubic metres of water was extracted (water production) from both Buck Lake and Magic Lake water sources in 2025; a 21% decrease from the previous year and a 9% decrease in the rolling five-year average. Water demand (customer water billing) for the service totaled 131,632 cubic metres of water; a 1% increase from the previous year and 1% increase from the rolling five-year average.

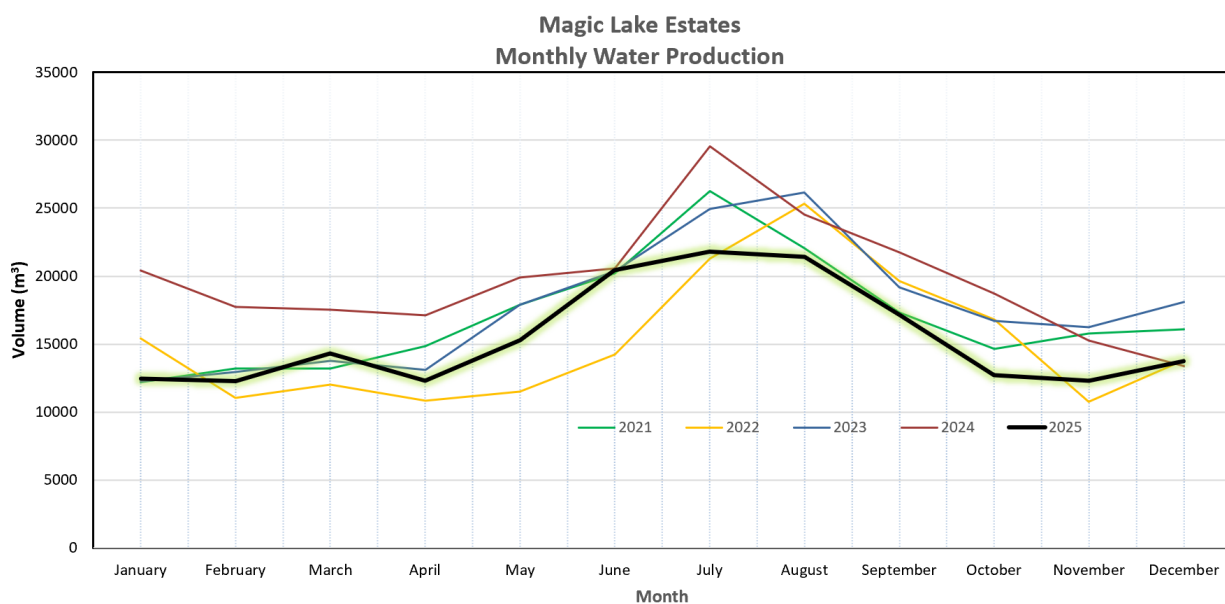


**Figure 4: Magic Lake Estates Water System Annual Water Production and Demand**

The difference between annual water production and annual customer water demand is referred to as non-revenue water and can include water system leaks, water system maintenance and operational use (e.g. water main flushing, filter system backwashing), potential unauthorized use and fire-fighting use.

The 2025 non-revenue water (54,514cubic metres) represents about 29% of the total water production for the service area. However, approximately 8,150 cubic metres of non-revenue water can be attributed to operational use. Therefore, the non-revenue water associated with system losses is approximately 25%, which is a decrease from the previous year, and is considered average for a water distribution system the size of Magic Lake Estates. Several water leaks were repaired in 2025 which significantly improved water loss from the previous year. Additional details of the repairs are provided in the operations update section of the annual report.

Figure 5 below illustrates the monthly water production for Magic Lake Estates for the past five years. The monthly water production trends are typical for smaller water systems such as Magic Lake Estates. In review of water production for 2025 (highlighted below), the monthly water production trends are typical for smaller water systems such as Magic Lake Estates, with the greatest demand during the summer months.



**Figure 5: Magic Lake Estates Water System Monthly Water Production.**

### Drinking Water Quality

Two intake lines from Buck Lake and Magic Lake supplied blended source water to the DAF treatment plant. The typical blending ratio in 2025 was 80/20 Buck Lake to Magic Lake, with a brief shift to 100% Buck Lake in August to avoid a cyanobacteria bloom in Magic Lake. No cyanotoxins were detected in Magic Lake during this event, and the drinking water supplied to the service area remained safe throughout the year.

The treatment system reduced total organic carbon (TOC) by nearly 50%; however, the high organic loading of the raw water still resulted in elevated TOC in the treated water, which can contribute to taste, odour, and colour issues and can increase the potential for disinfection by-product formation. Testing for total trihalomethanes in the treated water showed concentrations in compliance with the Guidelines for Canadian Drinking Water Quality (GCDWQ).

As in previous years, operations staff effectively mitigated localized water quality issues related to aging or stagnant water through targeted spot-flushing.

Overall Magic Lake Estates drinking water quality characteristics for 2025 are summarized below.

#### Raw Water:

- Both lake sources showed low total coliform concentrations during the winter months, with higher levels during the warm-water period. Magic Lake typically exhibits much higher summer coliform concentrations than Buck Lake, recording peaks of 3,400 CFU/100 ml in June and 2,000 CFU/100 ml in July. Buck Lake recorded its highest total coliform concentration in July at 340 CFU/100 ml. Overall, these results reflect normal seasonal bacteriological patterns for both lakes.
- E. coli bacteria concentrations were generally low in both lakes throughout the year. During the summer months the concentrations were slightly higher than during the rest of the year. This is a typical pattern for lakes.
- Raw water from both sources was medium hard (55 – 72 mg/L CaCO<sub>3</sub>).
- Magic Lake experienced a cyanobacteria bloom from August 6 to 29. No microcystin toxins were detected during the bloom. During that time, the source supply was switched from the normal 80% Buck Lake and 20% Magic Lake to 100% Buck Lake supply. Buck Lake had no algal blooms in 2025.
- Buck Lake showed raw water turbidity ranging from 0.4 to 1.4 nephelometric turbidity units (NTU), with an annual median of 0.6 NTU. Magic Lake ranged from 0.6 to 2.8 NTU, with an annual median of 0.9 NTU. Higher turbidity typically occurred during the winter months, but also occasionally during summer algae blooms. Turbidity levels in both lakes were consistent with historical patterns; Magic Lake, due to reduced algal activity in 2025, had generally clearer water than in previous years.
- Buck Lake, with an annual median total organic carbon (TOC) of 6.5 mg/L, and Magic Lake, with a median TOC of 8.3 mg/L, are considered mesotrophic lakes with medium productivity. TOC levels in both lakes were similar to those observed in 2024, with Magic Lake slightly lower due to reduced algal activity.
- Buck Lake has higher colour results during the winter period. Magic Lake's water exceeds the aesthetic objective for water colour all year which correlates with the higher TOC values in this lake. The higher water colour is typically caused by elevated concentration of organics in the water.
- Both lakes showed seasonally elevated iron and manganese concentrations, with peaks of 254 µg/L (Fe) and 59 µg/L (Mn) in May in Magic Lake, and 194 µg/L (Fe) and 149 µg/L (Mn) in November in Buck Lake. Buck Lake has historically exhibited higher seasonal manganese concentrations than Magic Lake. The metal concentrations recorded in 2025 were consistent with long term trends.

#### Treated Water:

- Treated water was bacteriologically safe to drink with no E. coli or total coliform bacteria found in the treated water.
- Treated water turbidity (cloudiness) was typically well below the GCDWQ limit of 1 NTU except for one sample collected on October 22 at the treatment plant outlet (6 NTU). It was concluded that this unusual result was due to a sampling error.
- Total organic carbon (TOC median 3.8 mg/L) was consistent with results in previous years. A nearly 50% reduction of TOC compared with the source water TOC concentrations indicates a satisfactory performance of the DAF plant. TOC concentrations of > 4 mg/L are considered a strong precursor for disinfection by-product formation and potential guidelines exceedance.

- Metals remained below the maximum acceptable concentration (MAC) and were generally below the aesthetic objective (AO), confirming the effectiveness of the potassium permanganate treatment system in removing iron and manganese. Two samples collected on November 19 at the treatment plant and within the distribution system, showed manganese concentrations slightly above the GCDWQ aesthetic objective, indicating a sub-optimal pre-oxidation treatment result at that time. Both source lakes typically undergo their annual turnover in November, which can rapidly alter iron and manganese levels in the raw water. During this period, operators need to perform daily bench tests to quickly identify such changes and adjust treatment accordingly.
- Disinfection by-products such as total trihalomethanes (TTHM) were in compliance with the annual average requirement in the GCDWQ; no individual samples exceeded the GCDWQ limit of 100 µg/L. TTHM concentrations fluctuated between 58 and 79 µg/L for an annual average of 72 µg/L. Haloacetic acids (HAA) were not tested in 2025 but are typically low when TTHM are low.
- Periods with algal blooms or high algal activity in the source lakes occasionally affected the taste and odour of the drinking water.
- The water temperature exceeded the GCDWQ aesthetic limit of 15°C between May and October.
- The newly established GCDWQ MAC for aluminum was at no time exceeded in 2025.

The attached Tables 1 and 2 provide a summary of the 2025 raw and treated water test results. Water quality data collected from this drinking water system can be reviewed on the CRD website:

<https://www.crd.bc.ca/about/data/drinking-water-quality-reports>

## **Water System Operational Highlights**

The following is a summary of the major operational issues that were addressed by CRD Infrastructure and Water Services staff in 2025:

- Water Treatment Plant:
  - Replaced failed modulating valve on DAF train
  - Replaced failed DAF focculator gearbox
  - Replaced failing UPS batteries at WTP
  - Operational response to several extensive power failures which caused depletion of UPS and other instrumentation issues
  - WTP clearwell inspected by remote operated vehicle (ROV)
  - Replacement of failed radio communications antenna at Captains Reservoir
  - WTP HVAC system corrective maintenance and VFD replacement
- Water Intakes and Distribution System:
  - Signal Hill Rd – June service line repair
  - Privateers Rd – July Main break repair. Further repairs needed under road. Road crossing temporarily isolated.
  - Replaced several hydrant isolation valves
  - Operational response for Magic Lake Dam emergency repair to address animal burrow
  - Motor Vehicle Incident response to damaged Bosun Pump Station
  - Installation of new water conservation signage

# Water System Capital Project Updates

The Capital Projects that were in progress or completed in 2025 included:

1. Replaced leaking stainless steel pipe replacement in basement
2. Captains Tank Upgrade – Concept Design

## SEWER SYSTEM

### Service Description

The community of Magic Lake Estates is primarily a rural residential development located on Pender Island in the Southern Gulf Islands Electoral Area which was originally serviced by a private sewer utility and in 1981 the service converted to the CRD. The sewer service is approximately 210 hectares in size and includes 735 parcels of which 651 have sewer connections and 709 are responsible for parcel tax payment. Some of the sewer infrastructure includes: 18.5 km of sewer pipe, 293 manholes, eight pump stations, and one treatment plant with an outfall into Swanson Channel. In the fall of 2024, Cannon wastewater treatment plant (WWTP) was replaced with a pump station and forcemain, which now pumps to an upgraded Schooner WWTP. Cannon WWTP is therefore no longer in service.

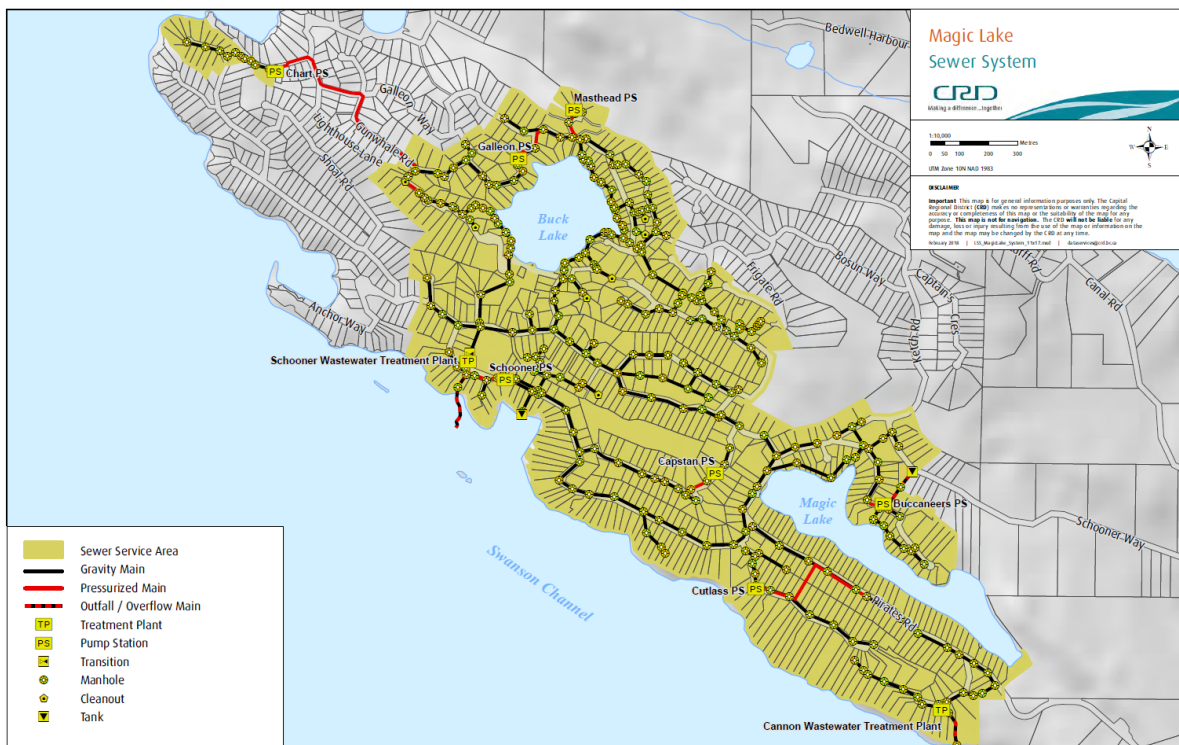


Figure 6: Map of Magic Lake Estates Sewer System

## Wastewater Flows

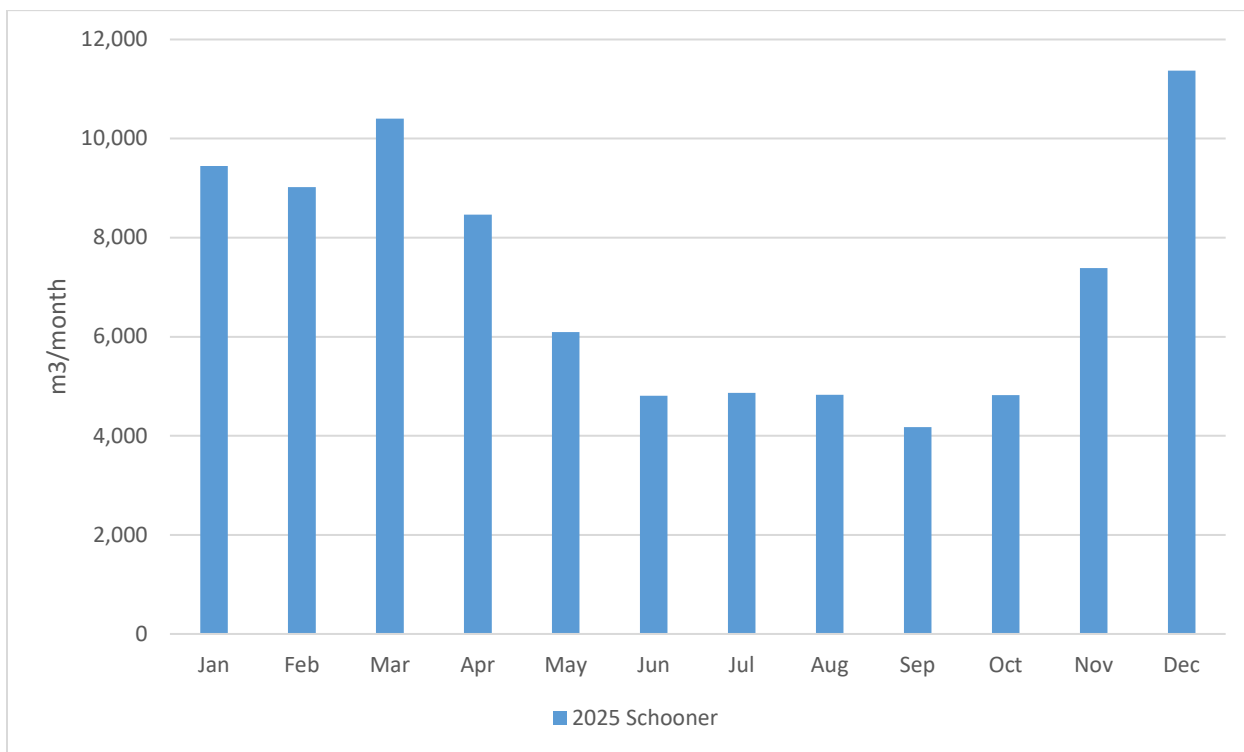
The total monthly and 11-year total annual flows for the Schooner WWTP are shown in Figures 7 and 8 below. The graphs indicate that the 2025 wastewater flows were about 4.5% lower than in 2024, and about the same as the 11-year average, even with the flows diverted from the old Cannon side of the system. The monthly flows show lowest flows in the summer months when there is less rain, but the more significant variation occurs in the winter due to inflow and infiltration (where December had flows almost three-times the flow as September).

The Municipal Wastewater Regulation (MWR), under the Provincial Environmental Management Act, contains requirements for the treatment, reuse and discharge of municipal wastewater effluent. The regulation includes a requirement that sewer flows reaching treatment plants should not exceed 2 times Average Dry Weather Flow (ADWF) during storm events with less than a 5-year return period. If the flows do exceed 2 times ADWF, the discharger must develop a liquid waste management plan or conduct a study and develop and implement Inflow and Infiltration (I&I) reduction measures. Based on the measured flow rates, the Magic Lake Estates sewer system does at times exceed 2 times ADWF. The CRD completed a study in 2018 with recommendations to use CCTV inspection to identify defects that could be contributing to I&I and to fix those defects, and that the sewer system flows continue to be monitored to identify trends. Pipe upgrades were completed annually until 2024 when funding was paused to focus on the WWTP upgrade project. Works were planned to be continued in 2028 for CCTV inspection and continued pipe upgrades. An updated I&I study including development of mitigation measures and implementation of these measures is proposed for 2027.

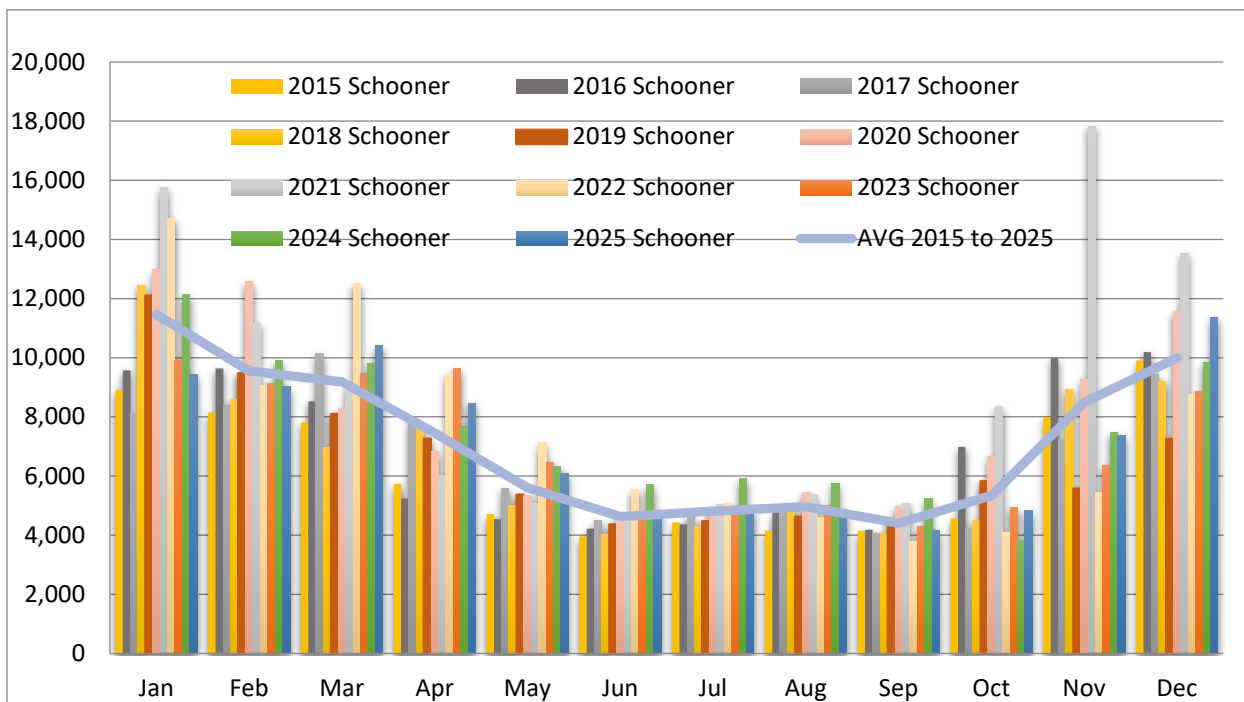
Historically, the peak winter flows resulted in a number of total daily flow exceedances at each treatment plant. Since the Schooner WWTP was upgraded and Cannon flows diverted, there were no exceedances in 2025. However, there were four non-compliance events at the Schooner WWTP in 2025, including:

- 1) A heavy rain-related equipment failure in March.
- 2) A failed wastewater toxicity test in July.
- 3) A spill of foam to ground around the bioreactor in September
- 4) A heavy rain unplanned bypass in December.

Even with the upgraded Schooner WWTP, some blending of screened and tertiary treated effluent during large storm events is anticipated (which may meet the regulatory effluent requirements but will be reported when blending occurs). Non-compliances due to power outages should be eliminated at Schooner WWTP due to the permanent standby generator.



**Figure 7: Total Monthly Flows 2025 (m³/month)**



**Figure 8: Total Wastewater Flows 2015-2025 (m³/year)**

### Treated Effluent – Regulatory Compliance

Flow and effluent quality are assessed for compliance with provincial and federal regulatory limits on a daily and monthly basis. In 2025, treated wastewater from Schooner WWTP met all regulatory limits for total suspended solids (TSS) and carbonaceous biochemical oxygen demand (CBOD), but had one fecal coliform exceedance coincident with the heavy rain event in March when high flows were coincident with a partial system shut down.

As expected with the WWTP upgrades, there were far fewer non-compliance events in 2025 compared to previous years. In 2024, there were five presumed or documented compliance exceedances due to power outages, as well as two fecal coliform exceedances and three flow exceedances. These flow exceedances occurred with inflow and infiltration during storm events before the WWTP had been upgraded. The installation of a permanent backup generator at Schooner WWTP is designed to reduce the frequency of power outages at the facility.

## **Receiving Water**

Routine monitoring of receiving water has historically been required every four years at the Schooner WWTP, with 2024 being the most recent planned sampling year. This sampling involves collecting 5 samples in a 30-day period ("5-in-30") for comparison to provincial guidelines, set to protect people who are recreating in the vicinity of the marine outfall or potentially harvesting shellfish (though the area around the outfall is closed for harvesting). An enhanced monitoring program was initiated in 2024 for 2 years, as required by the Ministry of Environment and Parks, after the commissioning of the new Schooner WWTP. This program consists of additional 5-in-30 sampling events over the course of 2025 and 2026, and includes bacteria (similar to the historic routine monitoring) as well as metals to assess risk to aquatic life.

The 2025 receiving environment bacteriological results were well below guidelines set to protect recreation and shellfish harvesting activities. These results confirm the outfall is working as expected. There were a few exceedances of metal water quality guidelines set to protect aquatic life, but it is too early in the enhanced monitoring program to confirm whether these exceedances were a result of the WWTP discharge or are representative of background conditions.

Receiving water sampling is also required if there are planned bypasses, WWTP failures/overflows, or wet weather overflows that exceed three days duration in the winter or one day duration in the summer. There was no non-routine receiving water sampling required in 2025.

## **Sewer Service Operational Highlights**

The following is a summary of the major operational issues that were addressed by CRD Electoral Area Services Water and Wastewater Operations staff in 2025:

- Schooner Wastewater Treatment Plant
  - Significant operational effort and support as part of the new Schooner Wastewater Treatment Plant capital upgrade project continued through 2025.
  - The plant has experienced challenges meeting design flows due to biological upsets from inflow and infiltration, as well as alkalinity and pH demand from the nitrification process. A temporary chemical pH control system was added to the process by Operations staff.
  - Foaming has been problematic in the bioreactor, and has required significant operational responses to manage it.
  - An additional membrane module was installed in May to support increased plant production demand.
  - UV disinfection lights were replaced and a new GFCI receptacle installed
  - Warranty related work was undertaken to address faulty generator equipment at WWTP and Galleon Pump Station
  - Danger tree removal around WWTP
  - Return activated sludge (RAS) pump rail adapter repair
  - Calibrated effluent flow meter
  - Deployed preventative maintenance plan for new equipment
  - Ongoing operational training for new WWTP
  
- Schooner Pump Station warranty pump repair

- Cannon WWTP decommissioning work by Operations
- Schooner Way sewer blockage emergency response and temporary remediation

### **Sewer Service Capital Project Updates**

The capital projects that were in progress or completed in 2025 were all related to the capital project “Wastewater Infrastructure Renewal – Pump Station and Treatment Plant Upgrades.” Substantial completion of the project was attained on December 10, 2024, but operational staff identified several deficiencies and additional required improvements, including facility treatment process optimization, programming adjustments, installation of an additional membrane cassette for increased plant capacity, and additional need for onsite technical equipment to monitor the new treatment process. Several occupational health and safety items were identified as needing to be addressed to comply with WorkSafeBC regulatory requirements as well. These safety and required capital project improvement items were not fully identified until the operations of the facility commenced in late 2024. The budget increase to address these was added to the 2025 capital plan through a Financial Plan Amendment, which was presented to and approved by the CRD Board on November 12, 2025. Staff progressed the required improvements and reviewed the project requirements versus deficiencies for the one-year walkthrough with the design engineering consultant.

### **Financial Report**

Please refer to the attached 2025 Statement of Operations and Reserve Balances.

Revenue includes parcel taxes (*Transfers from Government*), fixed user fees (*User Charges*), interest on savings (*Interest earnings*), a transfer from the maintenance reserve account, and miscellaneous revenue such as late payment charges (*Other revenue*).

Expenses include all costs of providing the service. *General Government Services* include budget preparation, financial management, utility billing and risk management services. *CRD Labour and Operating Costs* include CRD staff time as well as the cost of equipment, tools, and vehicles. Debt servicing costs are interest and principal payments on long term debt. *Other Expenses* include other costs to administer and operate the water and sewer systems, including insurance, water testing and electricity.

The difference between Revenue and Expenses is reported as *Net revenue* (expenses). Any transfers to or from capital or reserve funds for the service (*Transfers to own funds*) are deducted from this amount and it is then added to any surplus or deficit carry forward from the prior year, yielding an Accumulated Surplus (or deficit). In alignment with *Local Government Act* Section 374 (11), any deficit must be carried forward and included in next year's financial plan.

Attachments: Table 1: Summary of Raw Water Test Results, MLEWS  
Table 2: Summary of Treated Water Test Results, MLEWS  
Appendix A: 2025 Statement of Operations and Reserve Balances

For questions related to this Annual Report please email [IWSAdministration@crd.bc.ca](mailto:IWSAdministration@crd.bc.ca)

Table 1

Table 1: 2025 Summary of Raw Water Test Results, Magic Lake Estates Water System										
PARAMETER		2025 ANALYTICAL RESULTS				CANADIAN GUIDELINES	2015 - 2024 ANALYTICAL RESULTS			
Parameter Name	Units of Measure	Annual Median	Samples Analyzed	Range Minimum Maximum		≤ = Less than or equal to	Median	Samples Analyzed	Range Minimum Maximum	
(ND means Not Detected by analytical method used)										
<b>Physical/Biological Parameters</b>										
<b>Buck Lake</b>										
Carbon, Total Organic	mg/L	6.5	12	5.7	7.1		6.7	114	5.3	9.84
Colour, True	TCU	15	17	8	22	≤ 15 AO	13	166	7	29
Hardness as CaCO <sub>3</sub>	mg/L	68.95	4	66.9	71.7	No Guideline Required	65.3	43	57.9	73.5
pH	pH units	7.42	1	7.42	7.42	7.0 - 10.5 AO	7.605	24	6.86	8.3
Turbidity	NTU	0.6	17	0.4	1.4		0.9	168	0.36	10
<b>Magic Lake</b>										
Carbon, Total Organic	mg/L	8.25	12	7.7	9.9		8.705	110	6.4	11
Colour, True	TCU	27	17	21	35	≤ 15 AO	25	157	6	93
Hardness as CaCO <sub>3</sub>	mg/L	58.05	4	55.1	63.5	No Guideline Required	60.2	41	50.7	80.6
pH	pH units	7.59	1	7.59	7.59	7.0 - 10.5 AO	7.4	19	6.9	8.02
Turbidity	NTU	0.9	17	0.6	2.8		1.6	159	0.49	24.5
<b>Non-Metallic Inorganic Chemicals</b>										
<b>Buck Lake</b>										
Silicon	mg/L as Si	3705	4	3570	5060		5110	43	1330	6070
<b>Magic Lake</b>										
Silicon	mg/L as Si	1158.5	4	473	2660		1450	41	281	5760
<b>Metals</b>										
<b>Buck Lake</b>										
Aluminum	ug/L as Al	6.15	4	< 3	16.5	2900 MAC / 100 OG	9.7	43	< 3	95.6
Antimony	ug/L as Sb	< 0.5	4	< 0.5	< 0.5	6 MAC	< 0.5	43	< 0.5	< 0.5
Arsenic	ug/L as As	0.345	4	0.32	0.44	10 MAC	0.38	43	0.31	0.48
Barium	ug/L as Ba	10.4	4	8.8	11.8	1000 MAC	10.1	43	7.5	15.2
Beryllium	ug/L as Be	< 0.1	4	< 0.1	< 0.1		< 0.1	43	< 0.1	< 0.1
Bismuth	ug/L as Bi	< 1	4	< 1	< 1		< 1	43	< 1	< 1
Boron	ug/L as B	< 50	4	< 50	< 50	5000 MAC	< 50	43	< 50	< 50
Cadmium	ug/L as Cd	< 0.01	4	< 0.01	< 0.01	7 MAC	< 0.01	43	< 0.01	< 0.01
Calcium	mg/L as Ca	18.6	4	18	19.5	No Guideline Required	18	43	13.9	20.5
Chromium	ug/L as Cr	< 1	4	< 1	< 1	50 MAC	< 1	43	< 1	< 1
Cobalt	ug/L as Co	< 0.2	4	< 0.2	< 0.2		< 0.2	42	< 0.2	< 0.5
Copper	ug/L as Cu	0.585	4	0.41	0.6	2000 MAC / ≤ 1000 AO	0.75	43	0.35	37.3
Iron	ug/L as Fe	71.85	4	17.3	194	≤ 100 AO	71.2	43	14.2	507
Lead	ug/L as Pb	< 0.2	4	< 0.2	< 0.2	5 MAC	< 0.2	43	< 0.2	0.58
Lithium	ug/L as Li	< 2	4	< 2	< 2		< 2	29	< 2	< 5
Magnesium	mg/L as Mg	5.45	4	5.33	5.62	No Guideline Required	4.97	43	4.26	5.79
Manganese	ug/L as Mn	38.35	4	14.9	149	120 MAC / ≤ 20 AO	41.4	43	12	372
Molybdenum	ug/L as Mo	< 1	4	< 1	< 1		< 1	43	< 1	< 1
Nickel	ug/L as Ni	< 1	4	< 1	< 1		< 1	43	< 1	1.6
Potassium	mg/L as K	1.23	4	1.19	1.29		1.18	43	0.509	1.38
Selenium	ug/L as Se	< 0.1	4	< 0.1	< 0.1	50 MAC	< 0.1	43	< 0.1	< 0.1
Silver	ug/L as Ag	< 0.02	4	< 0.02	< 0.02	No Guideline Required	< 0.02	43	< 0.02	< 0.02
Sodium	mg/L as Na	11.7	4	11.4	12.4	≤ 200 AO	11	43	9.95	12.7
Strontium	ug/L as Sr	128.5	4	125	136	7000 MAC	119	43	109	134
Sulphur	mg/L as S	3.05	4	< 3	3.1		< 3	43	< 3	4.1
Tin	ug/L as Sn	< 5	4	< 5	< 5		< 5	43	< 5	< 5
Titanium	ug/L as Ti	< 5	4	< 5	< 5		< 5	43	< 5	< 5
Thallium	ug/L as Tl	< 0.01	4	< 0.01	< 0.01		< 0.01	43	< 0.01	< 0.05
Uranium	ug/L as U	< 0.1	4	< 0.1	< 0.1	20 MAC	< 0.1	43	< 0.1	< 0.1
Vanadium	ug/L as V	< 5	4	< 5	< 5		< 5	43	< 5	< 5
Zinc	ug/L as Zn	< 5	4	< 5	< 5	≤ 5000 AO	< 5	43	< 5	32.5
Zirconium	ug/L as Zr	< 0.1	4	< 0.1	< 0.1		< 0.1	43	< 0.1	< 0.5
<b>Magic Lake</b>										
Aluminum	ug/L as Al	13.4	4	< 3	19.8	2900 MAC / 100 OG	20.9	41	3.6	713
Antimony	ug/L as Sb	< 0.5	4	< 0.5	< 0.5	6 MAC	< 0.5	41	< 0.5	< 0.5
Arsenic	ug/L as As	0.425	4	0.36	0.55	10 MAC	0.47	41	0.35	2.75
Barium	ug/L as Ba	13.3	4	12.6	15.6	1000 MAC	14.9	41	12.2	84.9
Beryllium	ug/L as Be	< 0.1	4	< 0.1	< 0.1		< 0.1	41	< 0.1	< 0.1
Bismuth	ug/L as Bi	< 1	4	< 1	< 1		< 1	41	< 1	< 1
Boron	ug/L as B	< 50	4	< 50	< 50	5000 MAC	< 50	41	< 50	64
Cadmium	ug/L as Cd	< 0.01	4	< 0.01	< 0.01	7 MAC	< 0.01	41	< 0.01	0.023
Calcium	mg/L as Ca	14.45	4	13.5	15.4	No Guideline Required	15	41	12.7	19.8
Chromium	ug/L as Cr	< 1	4	< 1	< 1	50 MAC	< 1	41	< 1	8.6
Cobalt	ug/L as Co	< 0.2	4	< 0.2	< 0.2		< 0.2	41	< 0.2	< 0.5
Copper	ug/L as Cu	1.09	4	0.52	2.25	2000 MAC / ≤ 1000 AO	1.1	41	0.28	8.12
Iron	ug/L as Fe	108.5	4	72.6	254	≤ 100 AO	208	41	48.6	4260
Lead	ug/L as Pb	< 0.2	4	< 0.2	< 0.2	5 MAC	< 0.2	41	< 0.2	0.69
Lithium	ug/L as Li	< 2	4	< 2	< 2		< 2	32	< 2	< 5
Magnesium	mg/L as Mg	5.4	4	5.06	6.07	No Guideline Required	5.41	41	4.5	7.63
Manganese	ug/L as Mn	24.7	4	12.1	59	120 MAC / ≤ 20 AO	42.3	41	2.8	5000
Molybdenum	ug/L as Mo	< 1	4	< 1	< 1		< 1	41	< 1	8.3
Nickel	ug/L as Ni	< 1	4	< 1	< 1		< 1	41	< 1	36.5
Potassium	mg/L as K	0.9705	4	0.58	1.28		1.13	41	0.17	1.62
Selenium	ug/L as Se	< 0.1	4	< 0.1	< 0.1	50 MAC	< 0.1	41	< 0.1	< 0.1
Silver	ug/L as Ag	< 0.02	4	< 0.02	< 0.02	No Guideline Required	< 0.02	41	< 0.02	< 0.02
Sodium	mg/L as Na	11.6	4	11.2	12.9	≤ 200 AO	11.2	41	9.79	15.4
Strontium	ug/L as Sr	107	4	97	118	7000 MAC	108	41	86	158
Sulphur	mg/L as S	< 3	4	< 3	< 3		< 3	41	< 3	3.7
Tin	ug/L as Sn	< 5	4	< 5	< 5		< 5	41	< 5	< 5
Titanium	ug/L as Ti	< 5	4	< 5	< 5		< 5	41	< 5	22
Thallium	ug/L as Tl	< 0.01	4	< 0.01	< 0.01		< 0.01	41	< 0.01	< 0.05
Uranium	ug/L as U	< 0.1	4	< 0.1	< 0.1	20 MAC	< 0.1	41	< 0.1	0.19
Vanadium	ug/L as V	< 5	4	< 5	< 5		< 5	41	< 5	< 5
Zinc	ug/L as Zn	< 5	4	< 5	5.1	≤ 5000 AO	< 5	41	< 5	7.8
Zirconium	ug/L as Zr	< 0.1	4	< 0.1	0.1		< 0.1	41	< 0.05	< 0.5
<b>Microbial Parameters</b>										
<b>Indicator Bacteria (Buck Lake)</b>										
Coliform, Total	CFU/100 mL	42	17	1	340	0 MAC	69	169	2	4700
<i>E. coli</i>	CFU/100 mL	< 1	17	< 1	9	0 MAC	< 2	169	< 1	30
Hetero. Plate Count, 7 day	CFU/1 mL	Not tested in 2025				No Guideline Required	1345	64	330	5800
<b>Indicator Bacteria (Magic Lake)</b>										
Coliform, Total	CFU/100 mL	220	17	10	3400	0 MAC	435	150	9	63000
<i>E. coli</i>	CFU/100 mL	< 1	17	< 1	8	0 MAC	< 2	159	< 1	115
Hetero. Plate Count, 7 day	CFU/1 mL	Not tested in 2025				No Guideline Required	2600	59	370	20000
<b>Parasites (Buck Lake)</b>										
<i>Cryptosporidium</i> , Total oocysts	oocysts/100 L	< 1	2	< 1	< 1	Zero detection desirable	< 1	12	< 1	< 1
<i>Giardia</i> , Total cysts	cysts/100 L	< 1	2	< 1	< 1	Zero detection desirable	< 1	12	< 1	< 1
<b>Parasites (Magic Lake)</b>										
<i>Cryptosporidium</i> , Total oocysts	oocysts/100 L	< 1	2	< 1	2.38	Zero detection desirable	< 1	13	< 1	5.3
<i>Giardia</i> , Total cysts	cysts/100 L	< 1	2	< 1	< 1	Zero detection desirable	< 1	13	< 1	< 1

**Table 2**

Table 2: 2025 Summary of Treated Water Test Results, Magic Lake Estates Water System										
PARAMETER		2025 ANALYTICAL RESULTS				CANADIAN GUIDELINES	2015 - 2024 ANALYTICAL RESULTS			
Parameter Name	Units of Measure	Annual Median	Samples Analyzed	Range Min. Max.		≤ = Less than or equal to	Median	Samples Analyzed	Range Minimum Maximum	
ND means Not Detected by analytical method used										
<b>Physical Parameters</b>										
Carbon, Total Organic	mg/L as C	3.8	18	3.4	6.5		3.8	188	2.2	43.5
Colour, True	TCU	3	50	< 2	5	15 AO	< 2	794	< 0.7	11
Hardness as CaCO3	mg/L	66.7	10	62.9	71.8		64.8	119	56.4	72.1
pH	No units	7.045	2	6.99	7.1	7.0-10.5 AO	7.16	30	6.89	7.7
Turbidity	NTU	0.15	51	0.05	6	1 MAC and ≤ 5 AO	< 0.14	990	0.05	13
Water Temperature	Degrees C	12.3	238	3.3	23	≤ 15 C°C	10.5	4121	0	24.7
<b>Microbial Parameters</b>										
<b>Indicator Bacteria</b>										
Coliform, Total	CFU/100 mL	< 1	196	< 1	< 1	0 MAC	< 1	1372	<1	45
<i>E. coli</i>	CFU/100 mL	< 1	196	< 1	< 1	0 MAC	< 1	1372	<1	< 1
Hetero. Plate Count, 7 day	CFU/1 mL	85	12	< 10	640	No Guideline Required	< 10	218	< 10	6700
<b>Disinfectants</b>										
<b>Disinfectants</b>										
Chlorine, Free Residual	mg/L as Cl2	0.36	239	0.05	1.76	No Guideline Required	0.42	4459	0	4.9
Chlorine, Total Residual	mg/L as Cl2	0.82	1	0.82	0.82	No Guideline Required	0.6	3879	0.08	2.2
<b>Disinfection By-Products</b>										
<b>Trihalomethanes (THMs)</b>										
Bromodichloromethane	ug/L	16	6	15	20		18.5	69	12	24
Bromoform	ug/L	< 1	6	< 1	< 1		< 1	69	< 0.1	< 1
Chloroform	ug/L	51.5	6	39	60		49	69	30.3	87
Chlorodibromomethane	ug/L	3.15	6	2.6	4.2		3.25	69	<1	4.9
Total Trihalomethanes	ug/L	71.5	6	58	79	100 MAC	69	69	46	120
<b>Haloacetic Acids (HAAs)</b>										
HAA5	ug/L	Not tested in 2025				80 MAC	33.5	12	< 0.1	46
<b>Metals</b>										
Aluminum	ug/L as Al	28.35	10	16.6	65.2	2900 MAC / 100 OG	24.4	119	11.7	186
Antimony	ug/L as Sb	< 0.5	10	< 0.5	< 0.5	6 MAC	< 0.5	119	< 0.5	< 0.5
Arsenic	ug/L as As	0.23	10	0.16	0.29	10 MAC	0.22	119	0.14	0.36
Barium	ug/L as Ba	8.75	10	7.5	9	1000 MAC	8	119	5.7	10.7
Beryllium	ug/L as Be	< 0.1	10	< 0.1	< 0.1		< 0.1	119	< 0.1	0.1
Bismuth	ug/L as Bi	< 1	10	< 1	< 1		< 1	119	< 1	1
Boron	ug/L as B	< 50	10	< 50	< 50	5000 MAC	< 50	119	< 50	52
Cadmium	ug/L as Cd	< 0.01	10	< 0.01	< 0.01	7 MAC	< 0.01	119	< 0.01	0.035
Calcium	mg/L as Ca	17.65	10	16.2	19.6	No Guideline Required	17.4	119	15.2	19.8
Chromium	ug/L as Cr	< 1	10	< 1	< 1	50 MAC	< 1	119	< 1	< 1
Cobalt	ug/L as Co	< 0.2	10	< 0.2	< 0.2		< 0.2	119	< 0.2	< 0.5
Copper	ug/L as Cu	8.1	10	0.24	27.3	2000 MAC / ≤ 1000 AO	9.75	119	< 0.2	55.4
Iron	ug/L as Fe	< 5	10	< 5	14.7	≤ 100 AO	8.1	119	< 5	58.9
Lead	ug/L as Pb	0.46	10	< 0.2	1.16	5 MAC	0.47	119	< 0.2	2.39
Lithium	ug/L as Li	< 2	10	< 2	< 2		< 2	76	< 2	< 5
Magnesium	mg/L as Mg	5.545	10	5.07	5.88	No Guideline Required	5.04	119	4.31	5.7
Manganese	ug/L as Mn	2.55	10	< 1	33.2	120 MAC / ≤ 20 AO	3	119	< 1	190
Molybdenum	ug/L as Mo	< 1	10	< 1	< 1		< 1	119	< 1	< 1
Nickel	ug/L as Ni	< 1	10	< 1	< 1		< 1	119	< 1	2.8
Potassium	mg/L as K	1.3	10	1.18	1.37		1.37	119	1.17	1.63
Selenium	ug/L as Se	< 0.1	10	< 0.1	< 0.1	50 MAC	< 0.1	119	< 0.1	0.11
Silicon	ug/L as Si	2865	10	2450	4210		4030	119	2790	5140
Silver	ug/L as Ag	< 0.02	10	< 0.02	< 0.02	No Guideline Required	< 0.02	119	< 0.02	< 0.02
Sodium	mg/L as Na	14.55	10	13.2	15.6	≤ 200 AO	13.5	119	11.6	16
Strontium	ug/L as Sr	123.5	10	117	133	7000 MAC	118	119	102	133
Sulphur	mg/L as S	< 3	10	< 3	< 3		< 3	119	< 3	4.5
Tin	ug/L as Sn	< 5	10	< 5	< 5		< 5	119	< 5	< 5
Titanium	ug/L as Ti	< 5	10	< 5	< 5		< 5	119	< 5	< 5
Thallium	ug/L as Tl	< 0.01	10	< 0.01	< 0.01		< 0.01	119	< 0.01	< 0.05
Uranium	ug/L as U	< 0.1	10	< 0.1	< 0.1	20 MAC	< 0.1	119	< 0.1	< 0.1
Vanadium	ug/L as V	< 5	10	< 5	< 5		< 5	119	< 5	< 5
Zinc	ug/L as Zn	5.7	10	< 5	16.2	≤ 5000 AO	5.7	119	< 5	43.8
Zirconium	ug/L as Zr	< 0.1	10	< 0.1	< 0.1		< 0.1	118	< 0.1	< 0.5