



Making a difference...together

**MAGIC LAKE ESTATES WATER AND SEWER COMMITTEE**  
Notice of Meeting on **Tuesday, June 13, 2023 at 9:30 a.m.**  
Goldstream Conference Room, 479 Island Highway, Victoria, BC

For members of the **public who wish to listen to the meeting** via telephone please call **1-833-353-8610** and enter the **Participant Code 1911461 followed by #**. You will not be heard in the meeting room but will be able to listen to the proceedings.

M. Fossil (Chair)      J. Deschenes (Vice Chair)      P. Brent (Electoral Area Director)      A. Cyr  
W. Foster              D. Reed                                      R. Sullivan

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**AGENDA**

**1. APPROVAL OF AGENDA**

**2. ADOPTION OF MINUTES .....3**

*Recommendation: That the minutes of the April 4, 2023 meeting be adopted.*

**3. CHAIR’S REMARKS**

**4. PRESENTATIONS/DELEGATIONS**

*Delegations will have the option to participate electronically. Please complete the [online](#) application for “Addressing the Board” on our website and staff will respond with details.*

*Alternatively, you may email your comments on an agenda item to the Magic Lake Estates Water and Sewer Committee at [iwsadministration@crd.bc.ca](mailto:iwsadministration@crd.bc.ca).*

*Requests must be received no later than 4:30 p.m. two calendar days prior to the meeting.*

**5. SENIOR MANAGER’S REPORT**

- Electoral Areas Water Conservation Bylaw No. 1, 2022 (Bylaw No. 4492) – Update

**6. COMMITTEE BUSINESS**

**6.1. 2022 Annual Report.....6**

*There is no recommendation. This report is for information only.*

**6.2. Project and Operations Update .....24**

*There is no recommendation. This report is for information only.*

**6.3. Scope and funding for the remaining work after the current Wastewater Treatment Project is complete [Verbal]**

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*To ensure quorum, advise [IWSAdministration@crd.bc.ca](mailto:IWSAdministration@crd.bc.ca) if you cannot attend.*

**Magic Lake Estates Water and Sewer Committee  
Agenda – June 13, 2023**

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**7. CORRESPONDENCE**

**8. NEW BUSINESS**

**9. ADJOURNMENT**

**Next Meeting:** Tuesday, July 11, 2023



Making a difference...together

**MINUTES OF A MEETING OF THE Magic Lake Estates Water and Sewer Committee, held Tuesday, April 4, 2023 at 9:30 a.m., In the Goldstream Meeting Room, 479 Island Highway, Victoria, BC**

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**PRESENT: Committee Members:** M. Fossil (Chair); J. Deschenes (Vice Chair) (EP); W. Foster (EP); R. Sullivan

**Staff:** J. Marr, Acting Senior Manager, Infrastructure Engineering; J. Dales, Senior Manager, Wastewater Infrastructure Operations; M. Cowley, Manager, Wastewater Engineering and Planning; M. Bona, Project Engineer; Wastewater Engineering and Planning (EP); J. Kelly, Manager, Capital Projects; M. Risvold, Committee and Administrative Clerk (Recorder)

**REGRETS:** P. Brent (Electoral Area Director); A. Cyr; D. Reed

EP = Electronic Participation

The meeting was called to order at 9:42 am.

**1. APPROVAL OF AGENDA**

**MOVED** by J. Deschenes, **SECONDED** by W. Foster,  
That the agenda be approved.

**CARRIED**

**2. ADOPTION OF MINUTES**

The last bullet of item 6.3 was amended to read "Does not feel the exemptions for agriculture would be appropriate for the Magic Lake Estates area."

**MOVED** by W. Foster, **SECONDED** by J. Deschenes,  
That the minutes of the February 14, 2023 meeting be adopted as amended.

**CARRIED**

**3. CHAIR'S REMARKS**

The Chair thanked the J. Deschenes for chairing the February 14, 2023 meeting.

**4. PRESENTATIONS/DELEGATIONS**

There were none.

**5. SENIOR MANAGER'S REPORT**

J. Marr thanked the Committee for accommodating an earlier meeting for the month of April.

**6. COMMITTEE BUSINESS**

**6.1. Award of Contract 2022-846 Magic Lake Estates Wastewater Pump Station and Treatment Plant Upgrades**

M. Cowley spoke to item 6.1.

Staff responded to questions from the Committee regarding:

- Reducing the scope of work with Coast Utility Contracting Ltd. (Coast). Staff advised a letter has been sent to Coast and they are willing to remove items from the contract.
- Fixing pipes and manhole covers to resolve the non-compliances. Staff encouraged committee members to attend the tour of the plant and advised that pipes need to be replaced over time as they are in poor condition. All infrastructure is at its end of life, and there are no standby generators on site which leads to non-functioning equipment during an outage. Additionally, the clarifiers are not anchored or level. The Ministry of Environment wants the plants upgraded. The upgrade at Schooner will include an equalization storage tank, which will accommodate the extra water that comes in during a rainstorm event.
- The likeliness of having to discharge untreated sewage after the upgrades. Staff advised the equalization tank has been sized to handle up to a five-year storm event without overflowing, which meets the provincial requirements.
- Amount of funds committed thus far. Staff advised the actual and committed cost is \$4.3 million. The intent is that all funds will be spent, and the remaining contingency will be used for any unforeseen construction changes. There will be a surplus if there are no significant changes.

Discussion ensued regarding:

- Potential of fluctuating labour and material costs
- Risk of having to return the grant funds
- Risk of losing the grant
- Inflow and infiltration (I&I) from private properties

**MOVED** by R. Sullivan, **SECONDED** by J. Deschenes,

That the Magic Lake Estates Water and Sewer Committee recommends that the Electoral Areas Committee recommend to the Capital Regional District Board:

1. That Contact 2022-846, Magic Lake Estates Wastewater Pump Station and Treatment Plant Upgrades, be awarded to Coast Utility Contracting Ltd., in the amount of \$6,577,550 plus GST; and
2. That staff be authorized to issue Change Orders for the project as required, up to total aggregate amount of \$361,284 from the Project Contingency.

**CARRIED**

## **6.2. Project and Operations Update**

Staff provided updates on water capital projects and operations.

Staff responded to the following questions from the Committee:

- Regarding Capital Project 21-02 Design and Construction Buck Lake and Magic Lake Adjustable Intakes. Staff will provide a copy of the study to the Chair to distribute.
- The cause of the watermain break on Ketch Road. Staff will confirm the cause and inform the Committee.

Staff provided updates on wastewater capital projects and operations.

**7. CORRESPONDENCE**

There was none.

**8. NEW BUSINESS**

Staff advised there are two proposed dates for the Magic Lake Estates Treatment Plant tour, May 2, 2023, and May 9, 2023. The Committee will confirm a date with staff. Staff will confirm how many spots are available for the tour and advise if there is space for service area residents to attend. Staff will be on-site to provide information regarding the upgrades during the tour.

**9. ADJOURNMENT**

**MOVED** by R. Sullivan, **SECONDED** by W. Foster,  
That the April 4, 2023 meeting be adjourned at 10:59 am.

**CARRIED**

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**CHAIR**

\_\_\_\_\_  
**SECRETARY**

# Magic Lake Estates Water and Sewer System

## 2022 Annual Report

### CRD | Drinking Water and Wastewater

#### Introduction

This report provides a summary of the Magic Lake Estates (MLE) Water and Sewer Service for 2022 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 1,059 single family equivalents (or approximately the same amount of customers) obtaining service from the water system.

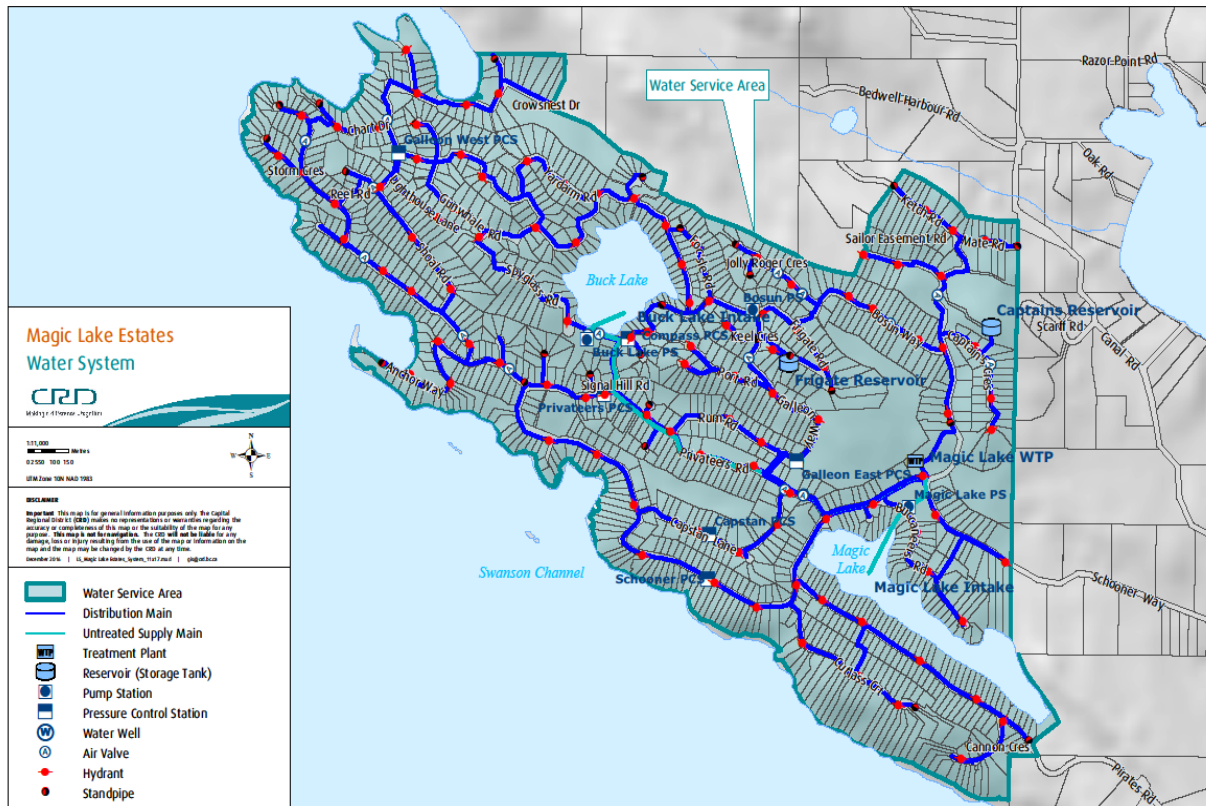


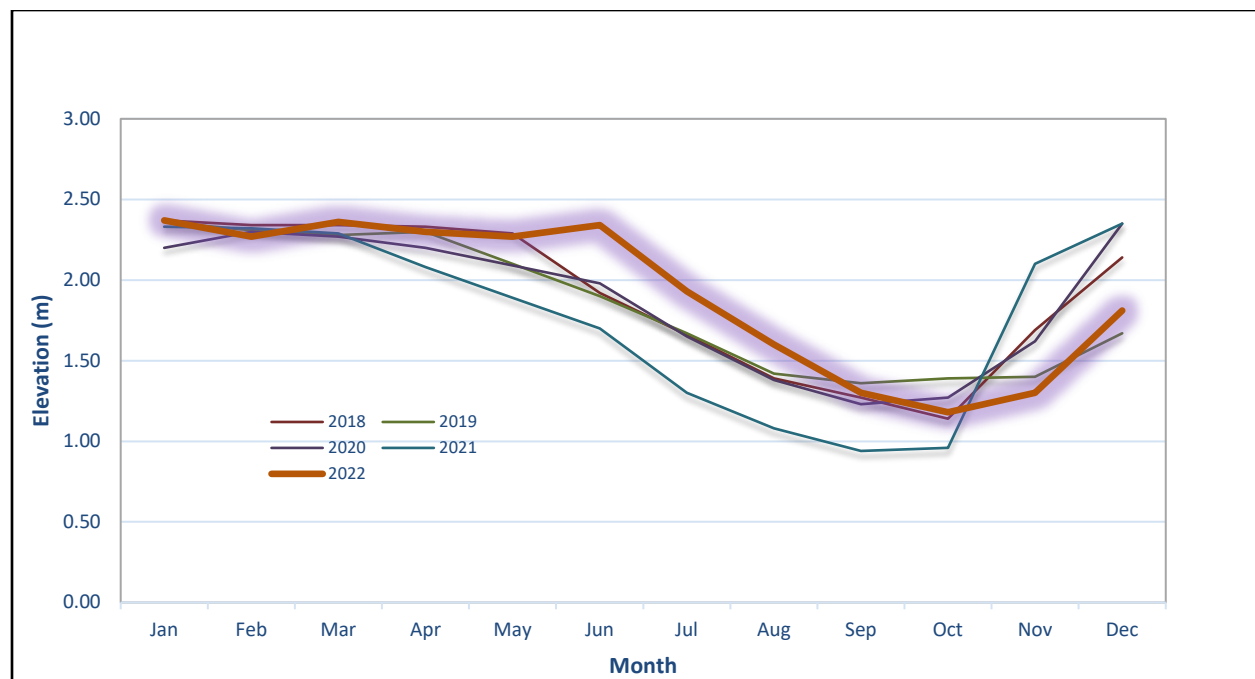
Figure 1: Map of Magic Lake Estates Water System

The Magic Lake Estates water system is primarily comprised of:

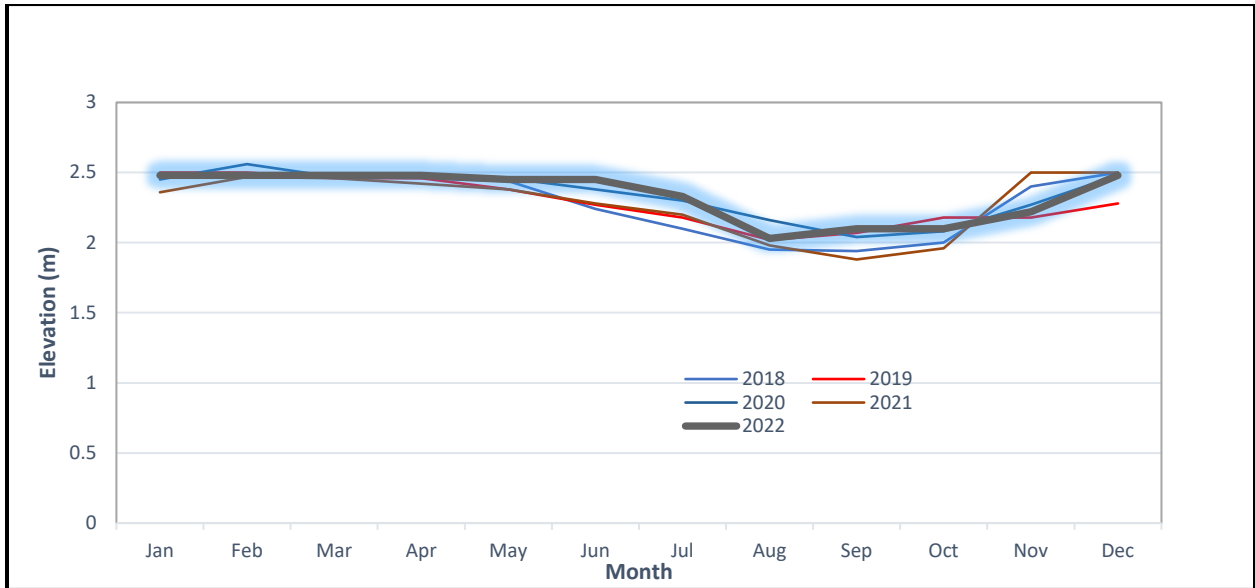
- Two raw water sources; Buck Lake (primary source) and Magic Lake (secondary source).
- Four earthen dam structures (two at Buck Lake and two at Magic Lake).
- Two raw water pump stations, one each related to the raw water supplies, with pretreatment oxidation equipment to treat and control dissolved 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 meters or 200,000 USg and Captains 341 cubic meters or 90,000 USg).
- Supervisory Control and Data Acquisition (SCADA) system.
- Distribution system and supply pipe network (in excess of 27 kilometers of water mains).
- Other water system assets: water service connections and meters, approximately 70 fire hydrants, 6 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, due to an algae event in Magic Lake, Buck Lake provided 100% of the raw water supply from approximately August to December of 2022.



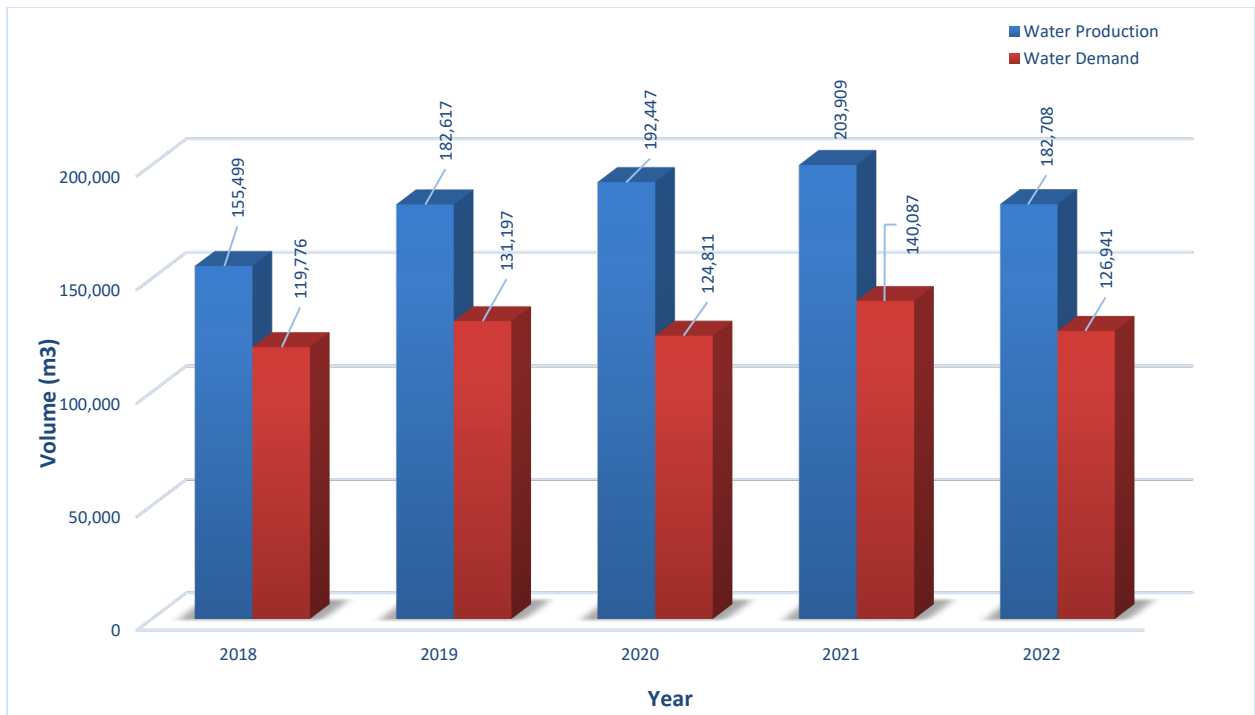
**Figure 2: Buck Lake Monthly Water Level**



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

**Water Production and Demand**

Referring to Figure 4, 182,708 cubic meters of water was extracted (water production) from both Buck Lake and Magic Lake water sources in 2022; a 10% decrease from the previous year and an increase in the rolling five-year average. Water demand (customer water billing) for the service totaled 126,941 cubic meters of water; a 9% decrease from the previous year and a 1% decrease from the rolling five-year average.



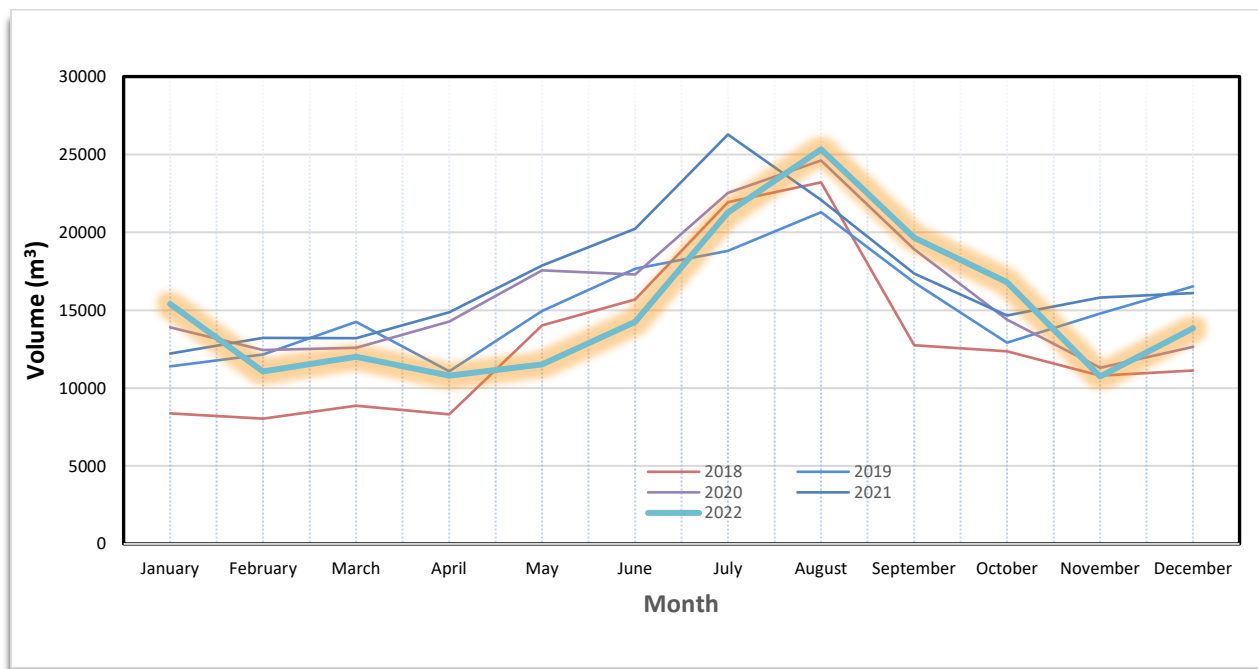
**Figure 4: Magic Lake Estates Water System Annual Water Production and Demand**



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 2022 non-revenue water (55,767 cubic meters) represents about 31% of the total water production for the service area. However, approximately 5,000 cubic meters of the non-revenue water can be attributed to operational use. Therefore, the non-revenue water associated with system losses is approximately 28% which is slight decrease from the previous year is moderate for a water distribution system the size of Magic Lake Estates.

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 2022, the monthly trend for August through October is higher than the previous years and is likely due to outdoor watering due to a dryer than normal fall period.



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

## Drinking Water Quality

Two intake lines from Buck Lake and Magic Lake provided blended source water to the DAF treatment plant. The typical intake blending ratio in 2022 was 80/20 Buck/Magic lakes unless water quality concerns or operational needs required a temporary adjustment. Due to a cyanobacteria bloom in Magic Lake, the source water supply came from Buck Lake only between August 22 and October 20, 2022. Buck Lake experienced an even more severe cyanobacteria bloom from the beginning of September to the end of October. During this period, the pot perm pre-oxidation treatment was discontinued to avoid lysing of the cyanobacteria cells which could introduce cyanotoxins to the water. Fortunately, no cyanotoxins were detected throughout this algal event. By October 25 the system went back to normal operation with an 80/20 raw water blending rate and reinstated pot perm treatment for iron and manganese removal. The drinking water supplied to the service area was safe for consumption throughout the year.

The existing multi-barrier treatment system was able to deal with several algal as well as high manganese events in both source lakes throughout the year. The treatment system was also able to reduce the total organic carbon (TOC) concentration by >50%, however, the high organic loading of the raw water still resulted in a high organic carbon concentration in the treated drinking water which can have taste and odour implications and can lead to high disinfection by-product concentrations. As in previous years, operations staff successfully mitigated localized adverse water quality events due to aging and stagnant water through spot-flushing.

Overall Magic Lake Estates drinking water quality characteristics for 2022 are summarized below.

#### Raw Water:

- Both lake sources exhibited low concentrations of total coliform bacteria throughout the winter months but higher concentration during the warm water period, which was extended well into October in 2022 due to an usually dry and warm fall. In Magic Lake, the peak total coliform bacteria concentrations was 2,100 CFU/100mL in mid July. This was lower than in 2021 and more in line with summers prior to the heat dome in 2021. Buck Lake saw a total coliform spike of 4,700 CFU/100mL at the end of May which was higher than in previous years.
- 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 (50 – 65 mg/L CaCO<sub>3</sub>).
- Buck Lake exhibited a raw water turbidity range from 0.45 to 3.0 nephelometric turbidity units (NTU) with an annual median of 1.2 NTU, and Magic Lake a range from 0.5 to 3.6 NTU with an annual median of 1.5 NTU. The higher turbidity occurred typically during the periods of increased algal activity in late summer and fall. The turbidity in both lakes was generally consistent with historical turbidity trends.
- Buck Lake, with an annual median total organic carbon (TOC) of 6.7 mg/L, and Magic Lake, with a median TOC of 8.8 mg/L, are considered mesotrophic lakes (medium productive).
- Both lakes exhibited seasonally elevated iron and manganese concentrations which reached peaks of 238 µg/L (Fe) in May and 80.7 µg/L (Mn) in September in Magic Lake, and 157 µg/L (Fe) in February and 129 µg/L (Mn) in November in Buck Lake. These metal concentrations were in line with long term trends.

#### Treated Water:

- Treated water was bacteriologically safe to drink with no E. coli or total coliform bacteria in the treated water found.
- Treated water turbidity (cloudiness) was typically well below the Guidelines for Canadian Drinking Water Quality (GCDWQ) limit of 1 NTU with the exception of very few isolated samples exceeding this limit on few occasions, mostly associated with operational activities such as flushing or pipe repairs.
- Total organic carbon (TOC median 3.6 mg/L) was consistent with results in previous years. A 54% reduction of TOC 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 were below maximum acceptable concentration (MAC) and consistently below the aesthetic objective (AO) limits, confirming the efficacy of the potassium permanganate treatment system in removing in particular iron and manganese.

- Disinfection by-products such as total trihalomethanes (TTHM) were in compliance with the annual average requirement in the GCDWQ; no individual samples did exceed the GCDWQ limit of 100 µg/L. TTHM concentrations fluctuated between 45 and 74 µg/L for an annual average of 59 µg/L. Haloacetic acids (HAA) were not tested in 2022 but are typically low when TTHM are low.
- Periods with algal blooms or high algal activity in the source lakes affected occasionally the taste and odour of the drinking water.
- The water temperature exceeded the GCDWQ aesthetic limit of 15°C between June and mid October.
- The newly established GCDWQ MAC for aluminum was at no time in 2022 exceeded.

Table 1 and 2 below provide a summary of the 2022 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 Integrated Water Services staff:

- Water Treatment Plant:
  - Air saturator system equipment troubleshooting.
  - Air blower system troubleshooting and control modifications.
  - Emergency safety lighting repairs.
  - Replacement of backwash flow meter equipment.
  - Replacement of DAF train 2 skimmer gearbox equipment.
  - Train 2 DAF skimmer chain replacement.
- Service line leak repairs:
  - Yardarm Road
  - Frigate Road
  - Schooner Road
  - Pirates Road
  - Mate Road
- Captains Reservoir (Tank) structural roof assessment to address safety concerns so that preventative maintenance tasks can be completed.
- Emergency response due to extended freezing weather event. The exposed pipe to Captains Reservoir froze.
- Unplanned SCADA system software upgrade to address the risk of continued reliable operation.

### **Water System Capital Project Updates**

The Capital Projects that were in progress or completed in 2022 included:

1. Design and Construction Buck Lake and Magic Lake Adjustable Intakes – Detailed design was completed. A contractor was selected and final contract execution and completion of the works is anticipated to be complete in 2023.
2. Buck Lake Dam Repairs – Phase 1 – Dam breach analysis completed.

- Failed valve replacements – 3 out of 6 valves previously identified as having failed were replaced. The remaining valves are expected to be replaced in 2023.

## 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 709 parcels of which 642 are serviced. Some of the sewer infrastructure includes: 16km of sewer pipe, 316 manholes, seven pump stations, and two treatment plants each with an outfall into Swanson Channel.

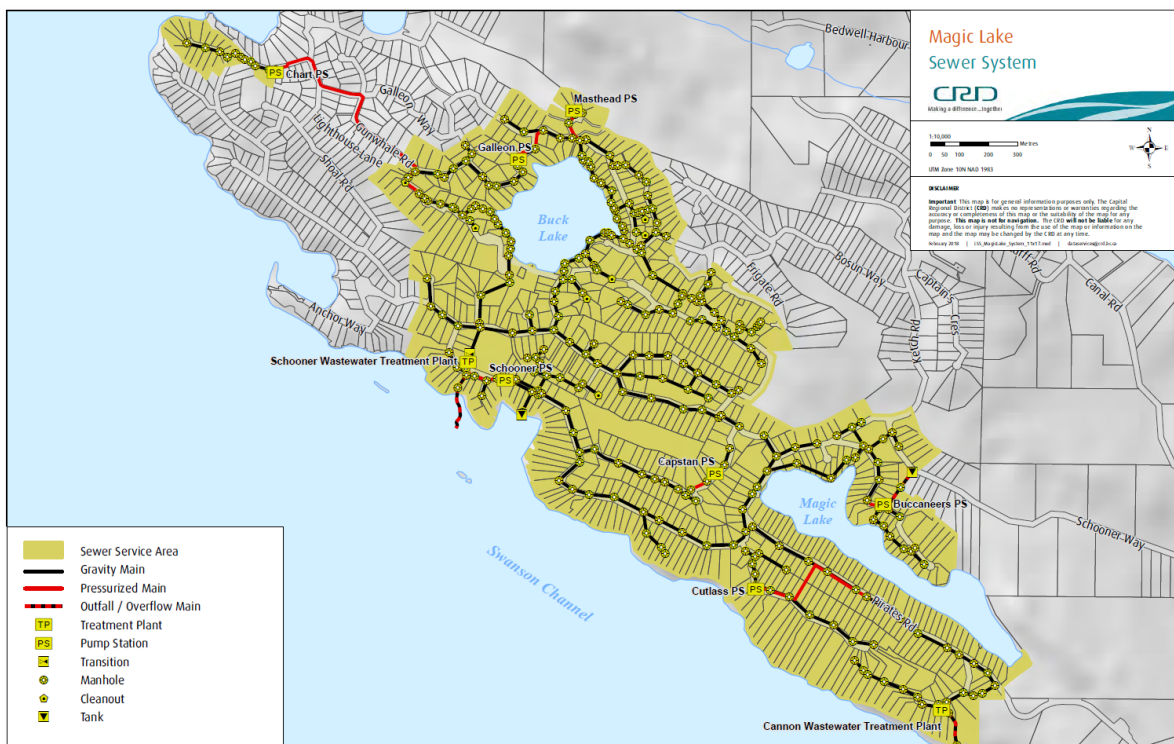


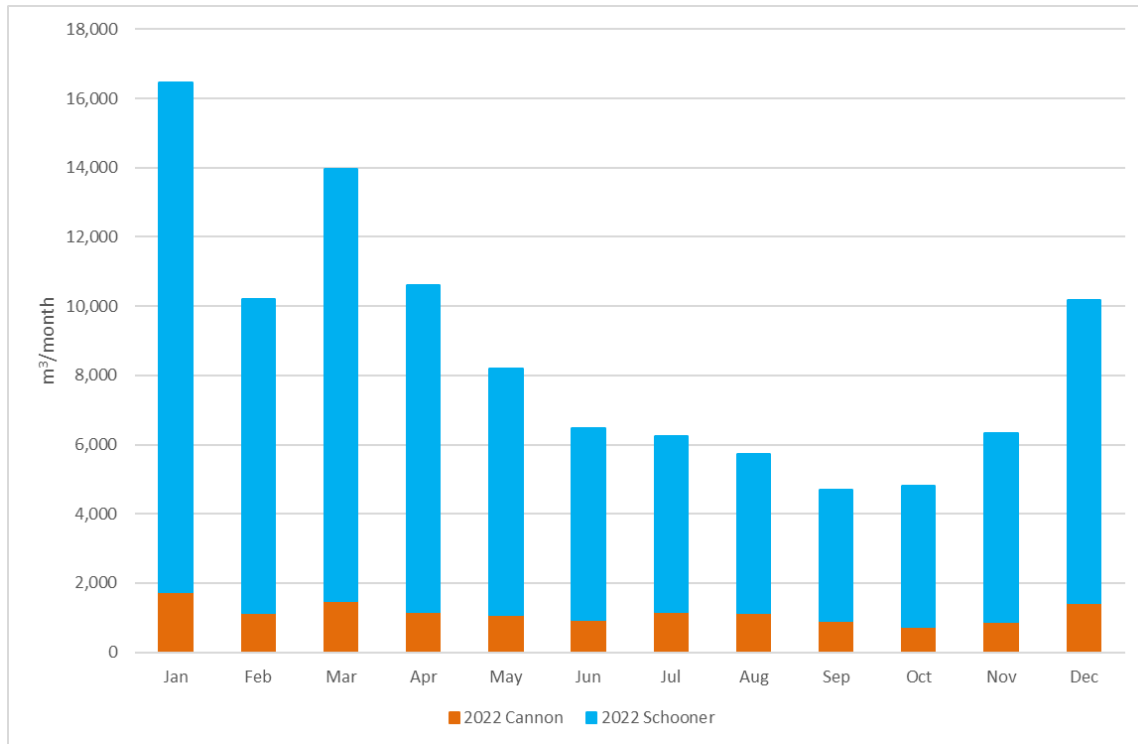
Figure 5: Map of Magic Lake Estates Sewer System

### Wastewater Flows

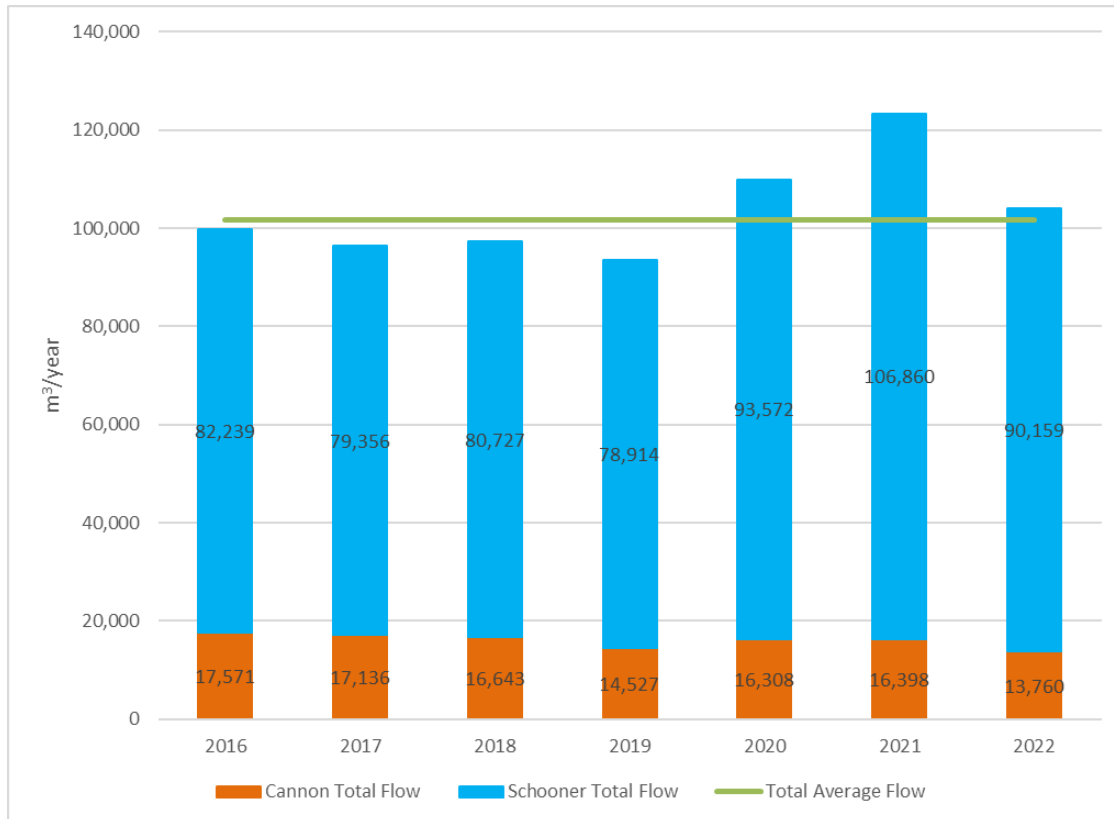
The total monthly and 7-year total annual flows are shown in Figures 6 and 7 below. The graphs indicate that the 2022 wastewater flows were about 16% higher than 2021 and about 2% higher than the 7-year average. The monthly flows show lowest flows in the summer months when there is less rain, but the more significant variation occurs in the winter due to inflow and infiltration (where January had 2-3 times the flow as July).

The Municipal Wastewater Regulation (MWR) 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 2.0 times “average dry weather flow” during storm events with less than a 5-year return period. Based on the measured flow rates, the Magic Lake Estates sewer system does not meet that requirement.

The peak winter flows have also resulted in a number of total daily flow exceedances at each treatment plant as shown in Figure 8 below.



**Figure 6: Total Monthly Flows (m³/month)**



**Figure 7: Total Wastewater Flows (m³/year)**

### Treated Effluent – Regulatory Compliance

Flow and effluent quality are assessed for compliance with the federal regulatory limits (Schooner only) and provincial discharge permits (both Schooner and Cannon) on a daily and monthly basis, respectively. In 2022, treated wastewater from Cannon exceeded regulatory limits for total suspended solids (TSS) and carbonaceous biochemical oxygen demand (CBOD) one time, and there were 14 presumed or documented compliance exceedances at Schooner. The Schooner exceedances were associated with heavy rain events, power outages, or unusual dumping events when the treatment system was unable to function as designed. Both plants exceeded their permitted daily flow allowances in 2022 on multiple occasions. The exceedances all occurred during storm events when inflow and infiltration occurs and because neither plant has equalization tanks to attenuate the peak flows. Figure 8 shows the number of exceedances at each plant along with the annual precipitation. In 2022 there were far fewer flow exceedances than 2021, with 5 at Schooner and 11 at Cannon (totaling 16 in 2022 versus 73 in 2021). This was primarily due to 2022 having significantly less precipitation than previous years. The British Columbia Ministry of Environment and Climate Change Strategy has issued non-compliance warning letters for these two treatment facilities and is expecting upgrades to bring them back into compliance.

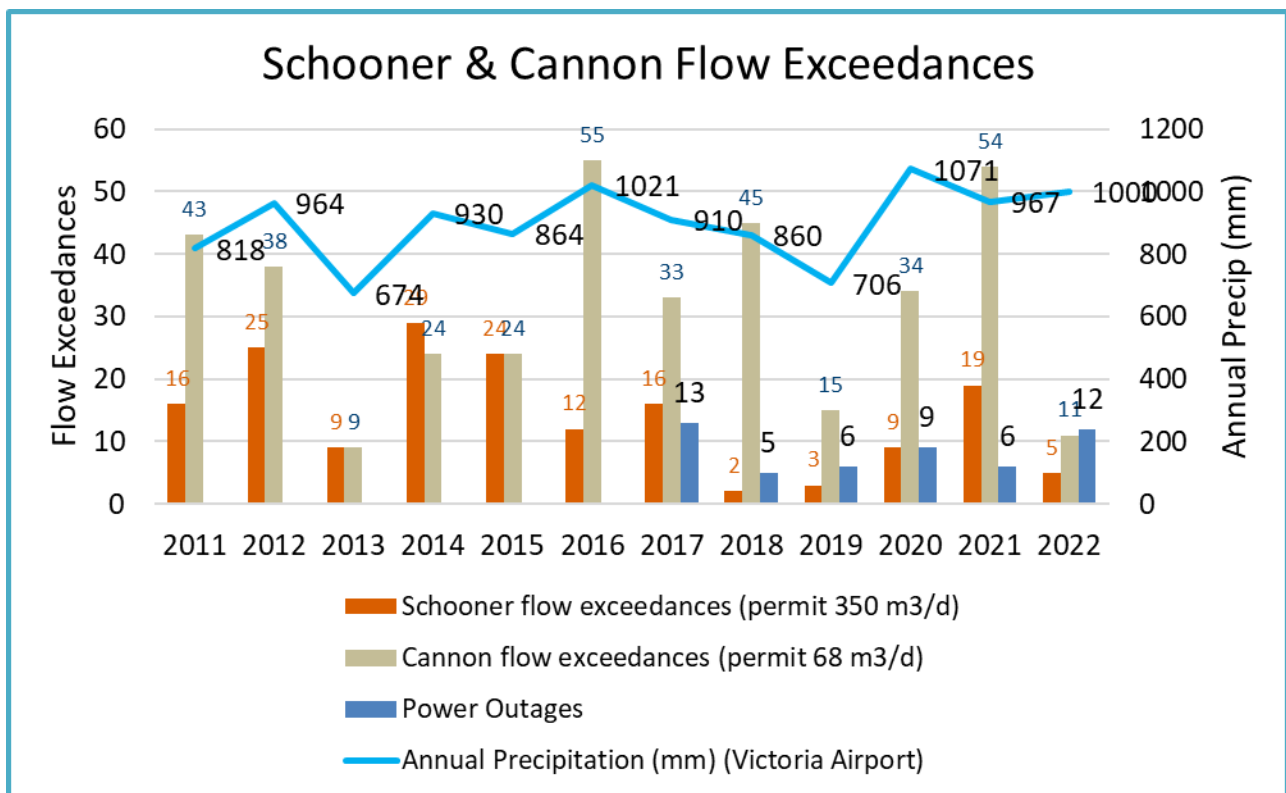


Figure 8: Schooner and Cannon Wastewater Treatment Plant (WWTP) Flow Exceedances

### Receiving Water

Routine receiving water monitoring was last required for both Magic Lake Estates Wastewater Treatment Plants in 2020 and will be next required in 2024 unless there are planned bypasses, plant failures/overflows, or wet weather overflows that exceed three days duration in the winter or one day duration in the summer. Bypass or overflow sampling is only required once per season for events that are similar in nature as long as the first seasonal sampling confirms results were within guidelines set to protect human primary contact for recreation.

There was no overflow/emergency receiving water sampling conducted in 2022.

## Sewer Service Operational Highlights

The following is a summary of the major operational issues that were addressed by CRD Integrated Water Services staff:

- Schooner Wastewater Treatment Plant
  - Replacement of damaged valves due to freezing during December/January cold weather event; installation of freeze protection equipment
  - Replacement of air blower variable frequency drive equipment
  - Replacement of influent sewage grinder electrical motor
  - Replacement of Return Activated Sludge (RAS) pump #2
  - Replacement of laboratory oven and vacuum pump
- Schooner Sewer Lift Station mechanical check valve removal and repair
- Sewer lateral repairs for Pirates Road
- Chart Drive Lift Station pump and pump check valve removal and replacement
- Sewer collection system backup near Schooner Way

## Sewer Service Capital Project Updates

The Capital Projects that were in progress or completed in 2022 included:

### 1. Wastewater Infrastructure Renewal – Sewer Replacement.

After public consultation, a referendum was held on November 23, 2019 to borrow up to \$6 million to complete Phase 1 upgrades. The referendum was successful and a design consultant (Stantec) was retained to complete the design of about 3km of sewer pipe replacement. The design was tendered in December 2020 and closed in February 2021. A contract was awarded and construction commenced in May, was substantially completed by December 2021, and closed out in 2022.

### 2. Wastewater Infrastructure Renewal – Pump Station and Treatment Plant Upgrades.

In 2020, the CRD submitted a grant application to the “Investing in Canada Infrastructure Program” for \$5.65 million of additional funding to complete the following work:

- Renew Buccaneer, Galleon, Schooner, Capstan, Cutlass and Masthead Pump Stations;
- Replace Cannon WWTP with a new pump station; and
- Upgrade Schooner WWTP.

The grant was approved in late summer 2021. A Request for Proposals was issued in the fall and McElhanney Ltd. was retained in 2022 to complete the design of the upgrades. It is anticipated that the design will be tendered in the first quarter of 2023 and construction will commence in the summer of 2023.

Refer to the website <https://www.crd.bc.ca/project/capital-projects/magic-lake-estates-wastewater-system-infrastructure-replacement-project-infrastructure-replacement-project> for more information.

## Financial Report

Please refer to the attached 2022 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 all other costs to administer and operate the water and sewer systems, including insurance, supplies, water testing and electricity.

The difference between Revenue and Expenses is reported as Net revenue (expenses). Any transfers to or from capital or reserve accounts for the service (Transfers to Own Funds) are deducted from this amount and added to any surplus or deficit carry forward from the prior year, yielding an Accumulated Surplus (or deficit) that is carried forward to the following year.

As of December 31, 2022, the accumulated minor deficit in Magic Lake Sewer-Debt Only (\$6 million) was \$4,529 due to the slightly higher interest rate for 2022 spring borrowing than estimate. In alignment with Local Government Act Section 374 (11), if actual expenditures exceed actual revenues, any deficiency must be included in the next years' financial plan. The financial plan approved by CRD Board on March 29, 2023 incorporated this deficit.

Submitted by:	Jason Dales, B.Sc., WD IV, Senior Manager, Wastewater Infrastructure Operations
	Joseph Marr, P.Eng., Acting Senior Manager, Infrastructure Engineering
	Glenn Harris, Ph.D., R.P.Bio., Senior Manager, Environmental Protection
	Rianna Lachance, BCom, CPA, CA, Senior Manager, Financial Services
Concurrence:	Ian Jesney, P.Eng., Acting General Manager, Integrated Water Services
	Larisa Hutcheson, P.Eng., General Manager, Parks & Environmental Services

Attachments: Table 1 - Summary of Raw Water Test Results  
 Table 2 - Summary of Treated Water Test Results  
 2022 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: 2022 Summary of Raw Water Test Results, Magic Lake Estates Water System										
PARAMETER		2022 ANALYTICAL RESULTS				CANADIAN GUIDELINES	2012 - 2021 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	6.7	11	5.3	8.5		6.6	79	5.6	9.84
Colour, True	TCU	11	17	9	29	≤ 15 AO	11	115	7	28
Hardness as CaCO <sub>3</sub>	mg/L	59.5	5	58.6	64.7	No Guideline Required	65.8	37	50.4	91.9
pH	pH units	Not tested in 2022				7.0 - 10.5 AO	7.66	29	6.86	8.78
Turbidity	NTU	1.2	17	0.45	3		0.9	165	0.36	10
<b>Magic Lake</b>										
Carbon, Total Organic	mg/L	8.8	11	6.4	11		8.6	75	6.76	11
Colour, True	TCU	24	17	15	45	≤ 15 AO	26	108	6	50
Hardness as CaCO <sub>3</sub>	mg/L	54.9	4	50.7	60.2	No Guideline Required	60.2	35	48.7	96
pH	pH units	Not tested in 2022				7.0 - 10.5 AO	7.4	23	6.9	8.13
Turbidity	NTU	1.5	17	0.5	3.6		1.6	106	0.19	24.5
<b>Non-Metallic Inorganic Chemicals</b>										
<b>Buck Lake</b>										
Silicon	mg/L as Si	4590	5	3310	5320		5140	37	4.6	11900
<b>Magic Lake</b>										
Silicon	mg/L as Si	1384.5	4	296	2740		1290	35	281	5760
<b>Metals</b>										
<b>Buck Lake</b>										
Aluminum	ug/L as Al	< 3	5	< 3	16.8	2900 MAC / 100 OG	10.3	37	< 3	194
Antimony	ug/L as Sb	< 0.5	5	< 0.5	< 0.5	6 MAC	< 0.5	37	0.041	0.578
Arsenic	ug/L as As	0.35	5	0.32	0.48	10 MAC	0.41	37	0.31	0.654
Barium	ug/L as Ba	8.8	5	8.6	10.5	1000 MAC	10.8	37	7.5	21.9
Beryllium	ug/L as Be	< 0.1	5	< 0.1	< 0.1		< 0.1	37	< 0.01	< 3
Bismuth	ug/L as Bi	< 1	5	< 1	< 1		< 1	31	0.074	< 1
Boron	ug/L as B	< 50	5	< 50	< 50	5000 MAC	< 50	37	< 50	656
Cadmium	ug/L as Cd	< 0.01	5	< 0.01	< 0.01	5 MAC	< 0.01	37	< 0.005	< 0.1
Calcium	mg/L as Ca	16.5	5	16.2	17.9	No Guideline Required	18.1	37	13.6	21.4
Chromium	ug/L as Cr	< 1	5	< 1	< 1	50 MAC	< 1	37	< 0.1	< 10
Cobalt	ug/L as Co	< 0.2	5	< 0.2	< 0.2		< 0.2	36	0.089	< 20
Copper	ug/L as Cu	0.66	5	0.35	0.68	2000 MAC / ≤ 1000 AO	1.23	37	0.36	37.3
Iron	ug/L as Fe	46.8	5	19.6	157	≤ 300 AO	66.6	37	14.2	507
Lead	ug/L as Pb	< 0.2	5	< 0.2	< 0.2	5 MAC	< 0.2	37	< 0.2	3.7
Lithium	ug/L as Li	< 2	5	< 2	< 2		< 2	17	< 2	< 2
Magnesium	mg/L as Mg	4.55	5	4.33	4.95	No Guideline Required	4.97	37	4	9.34
Manganese	ug/L as Mn	18.3	5	17.3	129	120 MAC / ≤ 20 AO	39.8	37	11	506
Molybdenum	ug/L as Mo	< 1	5	< 1	< 1		< 1	37	0.065	28
Nickel	ug/L as Ni	< 1	5	< 1	< 1		< 1	37	< 0.5	< 50
Potassium	mg/L as K	1.14	5	1.06	1.23		1.17	37	0.509	1.64
Selenium	ug/L as Se	< 0.1	5	< 0.1	< 0.1	50 MAC	< 0.1	37	0.047	0.739
Silver	ug/L as Ag	< 0.02	5	< 0.02	< 0.02	No Guideline Required	< 0.02	37	< 0.001	< 10
Sodium	mg/L as Na	10.2	5	9.95	10.8	≤ 200 AO	11	37	8.75	14.3
Strontium	ug/L as Sr	115	5	109	118	7000 MAC	117	37	81	134
Sulphur	mg/L as S	< 3	5	< 3	< 3		< 3	31	< 3	4.1
Tin	ug/L as Sn	< 5	5	< 5	< 5		< 5	37	< 0.2	< 20
Titanium	ug/L as Ti	< 5	5	< 5	< 5		< 5	37	< 0.5	< 10
Thallium	ug/L as Tl	< 0.01	5	< 0.01	< 0.01		< 0.01	31	< 0.002	< 0.05
Uranium	ug/L as U	< 0.1	5	< 0.1	< 0.1	20 MAC	< 0.1	31	0.012	< 0.1
Vanadium	ug/L as V	< 5	5	< 5	< 5		< 5	37	0.28	< 10
Zinc	ug/L as Zn	< 5	5	< 5	< 5	≤ 5000 AO	< 5	37	< 1	205
Zirconium	ug/L as Zr	< 0.1	5	< 0.1	< 0.1		< 0.1	31	< 0.1	< 0.5
<b>Magic Lake</b>										
Aluminum	ug/L as Al	10	4	9	22.3	2900 MAC / 100 OG	27.4	35	< 0.01	713
Antimony	ug/L as Sb	< 0.5	4	< 0.5	< 0.5	6 MAC	< 0.5	35	< 0.5	< 0.5
Arsenic	ug/L as As	0.425	4	0.35	0.75	10 MAC	0.53	35	0.35	2.75
Barium	ug/L as Ba	13.3	4	12.2	14.7	1000 MAC	15.3	35	< 9	84.9
Beryllium	ug/L as Be	< 0.1	4	< 0.1	< 0.1		< 0.1	35	< 0.1	< 3
Bismuth	ug/L as Bi	< 1	4	< 1	< 1		< 1	29	< 1	< 1
Boron	ug/L as B	< 50	4	< 50	64	5000 MAC	< 50	35	< 50	874
Cadmium	ug/L as Cd	< 0.01	4	< 0.01	< 0.01	5 MAC	< 0.01	34	< 0.01	< 0.1
Calcium	mg/L as Ca	13.8	4	12.9	15.1	No Guideline Required	15.2	35	11.6	19.8
Chromium	ug/L as Cr	< 1	4	< 1	< 1	50 MAC	< 1	35	< 1	< 10
Cobalt	ug/L as Co	< 0.2	4	< 0.2	< 0.2		< 0.2	35	< 0.2	< 20
Copper	ug/L as Cu	0.845	4	0.41	1.41	2000 MAC / ≤ 1000 AO	1.55	35	0.43	12
Iron	ug/L as Fe	168.5	4	48.6	238	≤ 300 AO	233	35	53.2	4260
Lead	ug/L as Pb	< 0.2	4	< 0.2	< 0.2	5 MAC	< 0.2	35	< 0.2	1.42
Lithium	ug/L as Li	< 2	4	< 2	< 2		< 2	20	< 2	< 2
Magnesium	mg/L as Mg	4.955	4	4.5	5.47	No Guideline Required	5.58	35	4.52	11.5
Manganese	ug/L as Mn	23.05	4	6.9	80.7	120 MAC / ≤ 20 AO	49.1	35	2.8	5000
Molybdenum	ug/L as Mo	< 1	4	< 1	< 1		< 1	35	< 1	27
Nickel	ug/L as Ni	< 1	4	< 1	< 1		< 1	35	< 1	< 50
Potassium	mg/L as K	1.145	4	0.895	1.24		1.09	35	0.17	1.62
Selenium	ug/L as Se	< 0.1	4	< 0.1	< 0.1	50 MAC	< 0.1	35	< 0.1	< 0.5
Silver	ug/L as Ag	< 0.02	4	< 0.02	< 0.02	No Guideline Required	< 0.02	35	< 0.02	< 10
Sodium	mg/L as Na	10.65	4	10	11.5	≤ 200 AO	11.2	35	9.02	15.4
Strontium	ug/L as Sr	97.1	4	90.4	114	7000 MAC	109	35	75	158
Sulphur	mg/L as S	< 3	4	< 3	< 3		< 3	29	< 3	3.7
Tin	ug/L as Sn	< 5	4	< 5	< 5		< 5	35	< 5	< 20
Titanium	ug/L as Ti	< 5	4	< 5	< 5		< 5	35	< 5	22
Thallium	ug/L as Tl	< 0.01	4	< 0.01	< 0.01		< 0.01	29	< 0.01	< 0.05
Uranium	ug/L as U	< 0.1	4	< 0.1	< 0.1	20 MAC	< 0.1	29	< 0.1	0.19
Vanadium	ug/L as V	< 5	4	< 5	< 5		< 5	35	< 5	< 10
Zinc	ug/L as Zn	< 5	4	< 5	< 5	≤ 5000 AO	< 5	35	< 1	215
Zirconium	ug/L as Zr	< 0.1	4	< 0.1	0.12		< 0.1	29	< 0.05	< 0.5
<b>Microbial Parameters</b>										
<b>Indicator Bacteria (Buck Lake)</b>										
Coliform, Total	CFU/100 mL	45	17	2	4700	0 MAC	75.5	191	< 1	10400
<i>E. coli</i>	CFU/100 mL	1.5	16	< 1	< 10	0 MAC	< 1	191	< 1	200
Hetero. Plate Count, 7 day	CFU/1 mL	Not tested in 2022				No Guideline Required	1345	64	330	A 5800
<b>Indicator Bacteria (Magic Lake)</b>										
Coliform, Total	CFU/100 mL	182	16	9	2100	0 MAC	640	144	< 1	7600
<i>E. coli</i>	CFU/100 mL	< 1	16	< 1	36	0 MAC	< 2	151	< 1	115
Hetero. Plate Count, 7 day	CFU/1 mL	Not tested in 2022				No Guideline Required	2600	59	370	G 20000
<b>Parasites (Buck Lake)</b>										
<i>Cryptosporidium</i> , Total oocysts	oocysts/100 L	< 1	2	< 1	< 1	Zero detection desirable	< 1	14	< 1	1.45
<i>Giardia</i> , Total cysts	cysts/100 L	< 1	2	< 1	< 1	Zero detection desirable	< 1	14	< 1	< 1
<b>Parasites (Magic Lake)</b>										
<i>Cryptosporidium</i> , Total oocysts	oocysts/100 L	< 1	2	< 1	< 1	Zero detection desirable	< 1	14	< 1	5.3
<i>Giardia</i> , Total cysts	cysts/100 L	< 1	2	< 1	< 1	Zero detection desirable	< 1	14	< 1	< 1

Table 2

Table 2: 2022 Summary of Treated Water Test Results, Magic Lake Estates Water System										
PARAMETER		2022 ANALYTICAL RESULTS				CANADIAN GUIDELINES	2012 - 2021 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	3.6	19	2.2	20		3.93	139	< 0.3	43.5
Colour, True	TCU	< 2	63	< 2	< 2	15 AO	< 2	628	< 2	5
Hardness as CaCO <sub>3</sub>	mg/L	58.7	11	56.4	63.4		64.9	85	58.1	72.1
pH	No units	Not tested in 2022				7.0-10.5 AO	7.16	29	6.89	7.7
Turbidity	NTU	0.15	63	0.1	3.9	1 MAC and ≤ 5 AO	0.16	964	0.11	4.4
Water Temperature	Degrees C	11.1	206	2.9	23.1	≤ 15 C°C	8.6	5315	3.9	24
<b>Microbial Parameters</b>										
<b>Indicator Bacteria</b>										
Coliform, Total	CFU/100 mL	< 1	189	< 1	< 1	0 MAC	< 1	1458	< 1	45
<i>E. coli</i>	CFU/100 mL	< 1	178	< 1	< 1	0 MAC	< 1	1460	< 1	< 1
Hetero. Plate Count, 7 day	CFU/1 mL	45	22	< 10	2300	No Guideline Required	< 10	168	< 10	6700
<b>Disinfectants</b>										
<b>Disinfectants</b>										
Chlorine, Free Residual	mg/L as Cl <sub>2</sub>	0.43	208	0.03	1.95	No Guideline Required	0.32	5342	0.02	4.9
Chlorine, Total Residual	mg/L as Cl <sub>2</sub>	0.54	146	0.11	2.18	No Guideline Required	0.66	5703	0.1	3.8
<b>Disinfection By-Products</b>										
<b>Trihalomethanes (THMs)</b>										
Bromodichloromethane	ug/L	14	8	< 1	19		18.5	57	11.2	24
Bromoform	ug/L	< 1	8	< 1	< 1		< 1	57	< 0.1	< 1
Chloroform	ug/L	47	8	36	65		54.5	57	18.8	100
Chlorodibromomethane	ug/L	2.2	8	< 1	3.6		3.25	56	< 0.1	4.9
Total Trihalomethanes	ug/L	58.5	8	38	88	100 MAC	71	57	25.9	124
<b>Haloacetic Acids (HAAs)</b>										
HAA5	ug/L	Not tested in 2022				80 MAC	33.5	12	< 0.1	46
<b>Metals</b>										
Aluminum	ug/L as Al	21.4	11	15.7	34.8	2900 MAC / 100 OG	25.7	85	11.7	186
Antimony	ug/L as Sb	< 0.5	11	< 0.5	< 0.5	6 MAC	< 0.5	85	0.033	< 0.5
Arsenic	ug/L as As	0.22	11	0.18	0.28	10 MAC	0.22	85	0.14	0.36
Barium	ug/L as Ba	7.5	11	5.7	9.4	1000 MAC	< 7.8	85	6	10.7
Beryllium	ug/L as Be	< 0.1	11	< 0.1	< 0.1		< 0.1	85	< 0.01	0.1
Bismuth	ug/L as Bi	< 1	11	< 1	< 1		< 1	85	< 0.005	1
Boron	ug/L as B	< 50	11	< 50	< 50	5000 MAC	< 50	85	< 50	52
Cadmium	ug/L as Cd	< 0.01	11	< 0.01	< 0.01	5 MAC	< 0.01	85	< 0.005	< 0.01
Calcium	mg/L as Ca	15.9	11	15.2	17.1	No Guideline Required	17.5	85	15.8	19.8
Chromium	ug/L as Cr	< 1	11	< 1	< 1	50 MAC	< 1	85	< 0.1	< 1
Cobalt	ug/L as Co	< 0.2	11	< 0.2	< 0.2		< 0.2	85	0.02	< 0.5
Copper	ug/L as Cu	9.26	11	0.21	55.4	2000 MAC / ≤ 1000 AO	9.75	85	0.25	23.3
Iron	ug/L as Fe	6.8	11	< 5	32.3	≤ 300 AO	8.3	85	2.4	34.5
Lead	ug/L as Pb	0.47	11	< 0.2	2.21	5 MAC	0.84	85	< 0.2	1.67
Lithium	ug/L as Li	< 2	11	< 2	< 2		< 5	42	0.85	< 5
Magnesium	mg/L as Mg	4.65	11	4.47	5.13	No Guideline Required	5.08	85	4.31	5.7
Manganese	ug/L as Mn	1.6	11	< 1	6.7	120 MAC / ≤ 20 AO	3.8	85	< 1	190
Molybdenum	ug/L as Mo	< 1	11	< 1	< 1		< 1	85	0.05	< 1
Nickel	ug/L as Ni	< 1	11	< 1	2.3		< 1	85	0.309	2.8
Potassium	mg/L as K	1.32	11	1.24	1.41		1.37	85	1.17	1.63
Selenium	ug/L as Se	< 0.1	11	< 0.1	< 0.1	50 MAC	< 0.1	85	< 0.04	0.11
Silicon	ug/L as Si	3760	11	3660	4590		4070	85	4.13	5140
Silver	ug/L as Ag	< 0.02	11	< 0.02	< 0.02	No Guideline Required	< 0.02	85	< 0.005	< 0.02
Sodium	mg/L as Na	12.2	11	11.8	13.9	≤ 200 AO	13.9	85	11.6	14.9
Strontium	ug/L as Sr	108	11	104	117	7000 MAC	119	85	102	133
Sulphur	mg/L as S	< 3	11	< 3	< 3		< 3	85	< 3	4.5
Tin	ug/L as Sn	< 5	11	< 5	< 5		< 5	85	< 0.2	< 5
Titanium	ug/L as Ti	< 5	11	< 5	< 5		< 5	85	< 0.5	< 5
Thallium	ug/L as Tl	< 0.01	11	< 0.01	< 0.01		< 0.01	85	< 0.002	< 0.05
Uranium	ug/L as U	< 0.1	11	< 0.1	< 0.1	20 MAC	< 0.1	85	< 0.002	< 0.1
Vanadium	ug/L as V	< 5	11	< 5	< 5		< 5	85	< 0.2	< 5
Zinc	ug/L as Zn	7	11	< 5	33.2	≤ 5000 AO	5.1	85	2.02	39.7
Zirconium	ug/L as Zr	< 0.1	11	< 0.1	< 0.1		< 0.1	84	< 0.1	< 0.5

## CAPITAL REGIONAL DISTRICT

### MAGIC LAKE ESTATE WATER Statement of Operations (Unaudited) For the Year Ended December 31, 2022

	2022	2021
<b>Revenue</b>		
Transfers from government	579,148	568,517
User Charges	355,431	345,573
Water Sales	16,770	26,833
Leases	7,714	8,100
Fees and Charges	1,354	1,191
Other revenue from own sources:		
Interest earnings	945	182
Transfer from Operating Reserve	16,150	60,818
Insurance Claim Reimbursement	871	11,372
Other revenue	2,165	1,029
<b>Total Revenue</b>	<b>980,548</b>	<b>1,023,615</b>
<b>Expenses</b>		
General government services	33,911	28,350
Contract for Services	34,391	24,881
CRD Labour and Operating costs	501,743	519,979
Capital Purchases	16,276	-
Debt Servicing Costs	194,588	194,572
Other expenses	199,639	193,016
<b>Total Expenses</b>	<b>980,548</b>	<b>960,798</b>
<b>Net revenue (expenses)</b>	<b>-</b>	<b>62,817</b>
Transfers to own funds:		
Capital Reserve Fund	-	62,817
Operating Reserve Fund	-	-
<b>Annual surplus/(deficit)</b>	<b>-</b>	<b>-</b>
Accumulated surplus/(deficit), beginning of year	-	-
<b>Accumulated surplus/(deficit), end of year</b>	<b>\$ -</b>	<b>-</b>

## CAPITAL REGIONAL DISTRICT

### MAGIC LAKE ESTATE WATER Statement of Reserve Balances (Unaudited) For the Year Ended December 31, 2022

	Capital Reserves	
	2022	2021
<b>Beginning Balance</b>	1,151,915	816,280
Transfer from Operating Budget	-	62,817
Transfer from Completed Capital Projects	28,585	5,491
Transfer to Capital Projects	(90,000)	(340,000)
Insurance settlement Funds Received	-	592,842
Interest Income	30,885	14,485
<b>Ending Balance</b>	<b>1,121,385</b>	<b>1,151,915</b>

	Operating Reserve	
	2022	2021
<b>Beginning Balance</b>	59,516	118,424
Transfer from Operating Budget	-	-
Transfer to Operating Budget	(16,150)	(60,818)
Interest Income	2,138	1,910
<b>Ending Balance</b>	<b>45,504</b>	<b>59,516</b>

## CAPITAL REGIONAL DISTRICT

### MAGIC LAKE ESTATE SEWER Statement of Operations (Unaudited) For the Year Ended December 31, 2022

	2022	2021
<b>Revenue</b>		
Transfers from government	586,010	576,831
User Charges	261,145	251,937
Allocation recovery revenue	10,870	10,654
Other revenue from own sources:		
Interest earnings	1,908	488
Transfer from Operating Reserve	25,000	11,740
Other revenue	3,419	1,832
<b>Total Revenue</b>	<b>888,352</b>	<b>853,482</b>
<b>Expenses</b>		
General government services	29,375	29,405
Contract for Services	106,037	91,567
CRD Labour and Operating costs	341,378	347,910
Debt Servicing Costs	174,477	174,383
Waste Sludge Disposal	77,303	74,900
Repairs & Maintenance	25,913	7,414
Other expenses	82,695	74,275
<b>Total Expenses</b>	<b>837,178</b>	<b>799,854</b>
<b>Net revenue (expenses)</b>	<b>51,174</b>	<b>53,628</b>
Transfers to own funds:		
Capital Reserve Fund	37,914	53,628
Operating Reserve Fund	13,260	-
<b>Annual surplus/(deficit)</b>	<b>-</b>	<b>-</b>
Accumulated surplus/(deficit), beginning of year	-	-
<b>Accumulated surplus/(deficit), end of year</b>	<b>\$ -</b>	<b>-</b>

## CAPITAL REGIONAL DISTRICT

### MAGIC LAKE ESTATE SEWER-DEBT (\$6M)

#### Statement of Operations (Unaudited)

For the Year Ended December 31, 2022

	2022	2021
<b>Revenue</b>		
Transfers from government	211,616	79,210
Other revenue	1,445	371
<b>Total Revenue</b>	<b>213,061</b>	<b>79,581</b>
<b>Expenses</b>		
Debt Servicing Costs	209,818	87,353
<b>Total Expenses</b>	<b>209,818</b>	<b>87,353</b>
<b>Net revenue (expenses)</b>	<b>3,243</b>	<b>(7,772)</b>
<b>Annual surplus/(deficit)</b>	<b>3,243</b>	<b>(7,772)</b>
Accumulated surplus/(deficit), beginning of year	(7,772)	-
<b>Accumulated surplus/(deficit), end of year</b>	<b>\$ (4,529)</b>	<b>(7,772)</b>

## CAPITAL REGIONAL DISTRICT

### MAGIC LAKE ESTATE SEWER Statement of Reserve Balances (Unaudited) For the Year Ended December 31, 2022

	Capital Reserve	
	2022	2021
<b>Beginning Balance</b>	306,661	278,391
Transfer from Operating Budget	37,914	53,628
Transfer from Completed Capital Projects	20,646	-
Transfer to Capital Projects	-	(30,000)
Interest Income	9,432	4,642
<b>Ending Balance</b>	<b>374,653</b>	<b>306,661</b>

	Operating Reserve	
	2022	2021
<b>Beginning Balance</b>	33,825	44,740
Transfer from Operating Budget	13,260	-
Transfer to Operating Budget	(25,000)	(11,740)
Interest Income	990	825
<b>Ending Balance</b>	<b>23,075</b>	<b>33,825</b>



**REPORT TO MAGIC LAKE ESTATES WATER AND SEWER COMMITTEE  
MEETING OF TUESDAY, JUNE 13, 2023**

**SUBJECT    Capital Project Status Reports and Operational Updates**

**ISSUE SUMMARY**

To provide the Magic Lake Estates Water and Sewer Committee with capital project status reports and operational updates up to and including May 31, 2023

**BACKGROUND**

The Magic Lake Estates (MLE) Water and Sewer Systems are located on the south shore of North Pender Island in the Southern Gulf Islands Electoral Area and provides drinking water and wastewater services to approximately 1,036 customers. Capital Regional District (CRD) Integrated Water Services is responsible for the overall operation of the water and wastewater systems with day-to-day operation, maintenance, design and construction of water and wastewater system facilities provided by the CRD Infrastructure Engineering and Operations Divisions. The quality of drinking water provided to customers in the Magic Lake Estates Water System is overseen by the CRD Water Quality Section.

**CAPITAL PROJECT UPDATE**

**Magic Lake Estates Water**

**23-03 | SCADA and Radio Communication Upgrades**

**Project Description:** Replace SCADA Communication infrastructure with modern radio system based on Radio Pathway Study completed under wastewater capital project 21-01.

**Project Rationale:** Upgrade communication equipment at water facilities as part of the wastewater upgrades (under Project 21-01) to make the entire system more secure and reliable.

**Project Update and Milestones:**

- The scope of work for the SCADA and Radio upgrades was included in the Wastewater Upgrade Tender.
- Contract 2022-846 - Magic Lake Estates Wastewater Pump Station and Treatment Plant Upgrades was awarded to Coast Utility Contracting Ltd. in April 2023.
- Installation of the radio upgrades will likely occur towards the end of the Treatment Plant upgrades in 2024.

Milestone	Completion Date
Detailed Design	January 2023
Tender	March 2023
Construction	May 2023 – May 2024
Commissioning (Substantial Completion)	May 2024
Warranty	May 2025



## 21-02 | Design and Construction Buck Lake and Magic Lake Adjustable Intakes

**Project Description:** Detailed design and construction of adjustable intakes to inform future capital works to maintain water quality.

**Project Rationale:** Both the Buck and Magic Lake adjustable intakes are unsafe to clean and adjust without employing divers. Funds are required to design and construct adjustable intakes.

**Project Update and Milestones:**

- A consultant was retained in November 2021 and they produced a draft design report summarizing design requirements for the intakes and floats on December 6, 2021.
- Design was completed.
- Tendering closed on June 29, 2022 but no bids were received.
- CRD had discussions with potential bidders who may be interested in providing quotations for this scope, only Pacific Industrial Marine (PIM) was interested in bidding.
- Recommendation to Award to PIM was signed off on November 4, 2022.
- Contract was executed on February 1, 2023 and Notice to Proceed was provided on February 7, 2023.
- The stipulated Substantial Completion date is September 30, 2023.

Milestone	Completion Date
Consultant retained	November 12, 2021
Draft conceptual design report received	December 6, 2021
Design submitted to Front Counter BC for notification	April 21, 2022
Original Tender Closing (no bids)	June 29, 2022
Subsequent bid and Recommendation to Award to PIM	November 4, 2022
Contract Executed	February 1, 2023
Notice to Proceed	February 7, 2023
Substantial Completion (Anticipated)	September 30, 2023

## 21-04 | Buck Lake Dam Repairs - Phase 1

**Project Description:** Conduct additional inspections, minor repairs, and performance analysis highlighted in the 2019 Dam Safety Review. Phase 2 dam improvements to be completed in the following five years.

**Project Rationale:** Resulting from the Hatch 2019 Dam Safety Review, funds are required to conduct additional inspections, minor dam repairs, and performance analysis. Phase 2 dam improvements to be completed in the following five years. The November 26, 2020 staff report outlines the detailed expenditure plan for Phase 1.

**Project Update and Milestones:**

- Detailed scope of work and acceptable options for preventing high live loads at Buck Lake Dam's west dam have been developed. This was reviewed during the 2022 annual inspection and a scope for warning signage is being proposed to be installed in 2023.
- Consultant was retained to conduct a dam breach analysis for both dams to confirm the dam flood area and improve the dam emergency plan. This report was finalized in January 2023.

**Magic Lake Estates Water and Sewer Committee – June 13, 2023**  
**Capital Project Status Reports and Operational Updates**

3

- Operations to coordinate with CRD Protective Services so that dam emergencies are part of CRD's Public Alert Notification System (PANS).
- CRD staff have started compiling required information for the dam emergency plan and operating and maintenance manuals. Updates are being completed as of January 2023.
- In 2023, engineering is assessing options for installation of a v-notch weir to monitoring lower flow seepage rates.

Milestone	Completion Date
Consultant retained to conduct dam breach analysis	December 20, 2021
Draft Dam Breach Analysis Complete and Comments returned	July 14, 2022
Final Dam Breach Analysis Complete	January 2023

### 22-01 | Failed Valve Replacement

Project Description: Replace six failed water main valves.

Project Rationale: Through annual operations of the water system, three valves have been identified as having failed. Funding is required to replace these valves at Capstan Crescent, Schooner Way and Privateers, Rum Road, Schooner Way and Ketch Road, Bosun Way, and Galleon Way.

Project Update and Milestones:

- Project to commence upon CRD Board approval of the 5-year capital plan at the March 16, 2022 meeting.
- Operations has completed three of the six valve locations and determined two of the sites no longer require replacement due to increased corrective maintenance. The remaining valve replacement sites are being further reviewed operationally. If further work is to proceed it will be completed by the end of 2023.

### 22-02 | EV Charging Station

Project Description: Construct a new Electric Vehicle (EV) Charging Station at the Water Treatment Plant.

Project Rationale: Construct a new EV Charging station at the water treatment plant, project is to be partially funded through a cost matching grant and the Service.

Project Update and Milestones:

- Project delivery is currently being planned with CRD Facilities and Operations.
- This project is now anticipated to be delivered in late 2023 to align with anticipated delivery time of electric vehicles.

Milestone	Completion Date
Notification of conditional grant approval	January 18, 2022

## **OPERATIONAL UPDATE**

This is an operational update report for April and May 2023.

- Water Treatment Plant:
  - Corrective maintenance filter rinse tank to recycle water pump 460 coupling replacement.
- Water distribution system interconnect leak detection and repair. Final repairs and system operation to be completed after water quality tests are performed.
- Schooner Way water service line leak repair.

## **Magic Lake Estates Sewer Utility**

### **20-01 | Wastewater Improvements – Sewer Replacement**

Project Description:

1. Replace about three kilometers (km) of failing asbestos cement (AC) pipe and install Cannon forcemain pipe (2021).

Project Rationale: Several km of failing AC sewer pipe requires replacement (to be completed over three years from 2021-2023).

Project Update and Milestones:

- All remaining funds have been allocated towards the Treatment Plant and Pump Station Upgrades.
- No additional sewer pipe will be replaced as part of this project.
- This project will be removed from this report going forward.

Milestone	Completion Date
Construction	Substantial Completion on December 17, 2021
Warranty Period	December 17, 2022

### **21-01 | Wastewater Improvements – Pump Station and Treatment Plant Upgrades**

Project Description:

1. Renew Buccaneer, Galleon, Schooner, Capstan, Cutlass and Masthead Pump Stations.
2. Replace Cannon Wastewater Treatment Plant (WWTP) with a new pump station.
3. Upgrade Schooner WWTP.

Project Rationale: Successfully received an Infrastructure Canada grant to complete upgrades on six pump stations, install a new pump station at Cannon to pump to Schooner WWTP, and upgrade Schooner WWTP to treat flow from Cannon and renew many components to bring the wastewater system into compliance with environmental regulations.

Project Update and Milestones:

- Contracts have been executed for the pre-purchased equipment (Gensets, Screen, Membranes, Blowers, and Diffusers) and shop drawings have been reviewed.

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- See the April 4, 2023 staff report entitled “Award of Contract 2022-846 Magic Lake Estates Wastewater Pump Station and Treatment Plant Upgrades” for tender results and recommendations.
- Contract 2022-846 has been awarded to Coast Utility Contracting Ltd. Scope has been revised to upgrade Schooner WWTP, replace Cannon WWTP with a new pump station, renew Schooner and Galleon pump stations, and complete communication upgrades at the other pump stations.
- A pre-construction kick-off meeting was held on April 28, 2023.
- Trees have been removed at Schooner and Cannon WWTP’s for the upgrades.
- Coast has started to mobilize and set up their site office at Schooner WWTP.
- Excavation will commence in June 2023 and construction will be in full force this summer.
- The Ministry of Forests, Lands and Natural Resources has approved work within the wetland area adjacent to Schooner WWTP, but requires 2,000 m2 of new wetland enhancement as compensation.
- Caurinus Environmental is preparing a Habitat Restoration Plan adjacent to Galleon Pump Station and Buck Lake as compensation for the removal of wetland area adjacent to Schooner WWTP. When it is received, the plan will be submitted to the Ministry for approval.
- Overall, the project schedule has slipped, but the project is still anticipated to be substantially complete by the second quarter of 2024 depending on the contractor’s schedule.

Milestone	Completion Date
Preliminary Design (30%)	September 2022
Detailed Design (90%)	December 2022
Tender Period	January 27 – March 14, 2023
Construction Period	May 2023 – May 2024
Substantial Completion	May 2024
Warranty Period	May 2025

**OPERATIONAL UPDATE**

This is an operational update report for April and May 2023.

- Chart Drive sewage pump station force main leak investigation and repair at the intersection of Galleon Way and Dory Way. Emergency response included the cleanup of sewage spill area and issuing of environmental incident report to the regulators.
- Schooner sewage pump station emergency response to power and communications system failures. Response included temporary hauling of sewage from Schooner Pump Station to the Schooner Wastewater Treatment Plant while repairs were completed.
- Emergency response to blocked sewer lateral near Doubloon Crescent.
- Cutlass Court Pump Station corrective maintenance that included deragging (removing obstructions) of the pumps and mechanical inspection.

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**Table 1: Operating Permit Regulatory Non-compliance reporting for April and May 2023**

Facility	April and May Reports Issued	Reports YTD 2023	Total Reports 2022	Cause
<b>Schooner WWTP</b>	0	4	20	Environmental Incidence Reports are issued typically as a result of: <ol style="list-style-type: none"> <li>1. Facility power outage causing loss of UV disinfection resulting in exceedance of fecal coliform (FC) regulatory requirements (permit &lt;200 cfu/100ml).</li> <li>2. Exceedance of permitted daily maximum flows (&lt; 640m<sup>3</sup>/day). Flow exceedances are due to excessive collection system inflow and infiltration (I&amp;I).</li> <li>3. Exceedance of permitted total suspended solids (TSS) (&lt;45mg/l). This is type of exceedance is the result of high I&amp;I.</li> </ol>
<b>Schooner Pump Station</b>	0	0	1	Typically, these are overflow events into the marine environment (Boat Nook) due to extended power failures in the area. There is no standby power at the facility.
<b>Cannon WWTP</b>	0	1	12	Exceeding maximum daily flows due to storm water entering through I&I. However other non-compliances can be: <ul style="list-style-type: none"> <li>• Permit exceedance: total suspended solids (TSS) (&lt;60mg/l) and carbonaceous biochemical oxygen demand (CBOD) (&lt;45mg/l)</li> <li>• Toxicity testing</li> </ul>

**RECOMMENDATION**

There is no recommendation. This report is for information only.

Submitted by:	Malcolm Cowley, P.Eng., Manager, Wastewater Engineering and Planning
Submitted by:	Dan Robson, A.Sc.T., Manager, Saanich Peninsula and Gulf Islands Operations
Submitted by:	Jared Kelly, P.Eng., Manager, Capital Projects
Concurrence:	Joseph Marr, P.Eng., Acting Senior Manager, Infrastructure Engineering
Concurrence:	Jason Dales, B.Sc., WD IV., Senior Manager, Wastewater Infrastructure Operations
Concurrence:	Ian Jesney, P.Eng., Acting General Manager, Integrated Water Services
Concurrence:	Larisa Hutcheson, P.Eng., General Manager, Parks & Environmental Services