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LYALL HARBOUR/BOOT COVE WATER LOCAL SERVICE COMMITTEE Notice of Meeting on **Tuesday, June 21, 2022 at 2:00 p.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.

J. Crerar (Chair)	P. Brent, Acting Electoral Area Director	J. Money
A. Olsen	I. Rowe	J. Sabre-Makofka

AGENDA

1. APPROVAL OF AGENDA

2. ADOPTION OF MINUTES 3
***Recommendation**: That the minutes of the February 24, 2022 meeting be adopted.*

3. CHAIR'S REMARKS

4. PRESENTATIONS/DELEGATIONS

The public are welcome to attend Committee meetings in-person.

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 Lyall Harbour/Boot Cove Water Local Service Committee at 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
- Bylaw No. 4446 – A Bylaw to Amend Appointment for the Lyall Harbour/Boot Cove Water Local Service Committee (Bylaw No. 1875)
- Verbal discussion to introduce draft Local Service Area Water Conservation Bylaw
- Alternate Approval Process (AAP) discussion

6. COMMITTEE BUSINESS

6.1. Project and Operations Update.....6
***Recommendation:** There is no recommendation. This report is for information only.*

6.2. 2021 Annual Report.....8
***Recommendation:** There is no recommendation. This report is for information only.*

7. CORRESPONDENCE

8. NEW BUSINESS

*To ensure quorum, advise **Mikayla Risvold 250.474.9518** if you cannot attend.*

IWSS-297445977-8136

9. ADJOURNMENT

Next Meeting: November 2022

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MINUTES OF A MEETING OF THE Lyall Harbour Boot Cove Water Local Service Committee, held Thursday, February 24, 2022 at 9:30 a.m., In the Goldstream Room, 479 Island Highway, Victoria, BC

PRESENT: **Committee Members:** J. Crerar (Chair); J. Money; A. Olsen; I. Rowe (EP); J. Sabre-Makofka (EP); P. Brent (EP) for D. Howe, Electoral Area Director

Staff: J. Marr, Acting Senior Manager, Infrastructure Engineering; M. McCrank, Senior Manager, Wastewater Infrastructure Operations; C. Moch, Manager, Water Quality Operations; D. Puskas, Manager, Capital Projects; D. Robson, Manager, Saanich Peninsula and Gulf Islands Operations; D. Dionne, Administrative Coordinator; M. Risvold, Committee and Administrative Clerk (Recorder)

REGRETS:

EP = Electronic Participation

The meeting was called to order at 9:31.

1. ELECTION OF CHAIR

The Acting Senior Manager called for nominations for the position of Chair of the Lyall Harbour/Boot Cove Water Local Service Committee for the term ending December 31, 2022.

J. Money nominated J. Crerar. J. Crerar accepted the nomination.

The Acting Senior Manager called for nominations a second time.

The Acting Senior Manager called for nominations a third and final time.

Hearing no further nominations, the Acting Senior Manager declared J. Crerar Chair of the Lyall Harbour/Boot Cove Water Local Service Committee for the term ending December 31, 2022 by acclamation.

2. APPROVAL OF AGENDA

MOVED by A. Olsen, **SECONDED** by J. Sabre-Makofka,
That the agenda be approved.

CARRIED

3. ADOPTION OF MINUTES

MOVED by J. Money, **SECONDED** by J. Sabre-Makofka,
That the minutes of the October 25, 2021 meeting be adopted.

CARRIED

4. CHAIR'S REMARKS

The Chair thanked everyone for attending the meeting and provided the following remarks:

- Concern regarding the current boil water advisory.
- The turbidity research began with the University of Victoria (UVic).
- Key road area washout linking the reservoir and water treatment plant, which was repaired quickly.
- Thanked staff for sending out monthly notices to the community.
- Thanked staff for supporting the Lyall Harbour/Boot Cove water system.
- Thanked Director Howe for the grant covering costs for the upgrades.

5. PRESENTATIONS/DELEGATIONS

There were no presentations or delegations.

6. SENIOR MANAGER'S REPORT

J. Marr provided the committee meeting schedule for the year advising there will be three meetings held in 2022. The meetings will be held in the months of February, June and September. Additional meetings remain at the call of the Chair.

7. COMMISSION BUSINESS

7.1. Project and Operations Update

D. Puskas provided the Capital Project update.

Staff responded to questions from the committee in regard to the Pressure Release Valve (PRV) Bypass Assembly Replacement project and the Dam Improvements & Regulatory Requirements project. Staff advised the projects will be completed separately due to being different natures of work. Dam requirements are not necessarily associated with turbidity, and the work is required regardless of the results provided from the UVic study. The dam safety project will likely augment the water supply, and staff will review the data to determine the treatments required. As the project is funded by the Community Works Fund, a consultant and contractor will be overseeing the project. Notice will be sent to the public if there will be any interruptions to the water service, and there will be a contingency in place in the event the service will be interrupted beyond one day. Discussion ensued.

M. McCrank provided the Operations update.

Staff responded to a question from the committee in regard to leak detection, and advised efforts are being made to remind the public to monitor for leaks. Zone meters and pressure release valves are used to determine where leaks occur. A warning is sent to users when consumption levels increase, suggesting the user checks for leaks.

Staff noted the colour of water is not a health parameter. The turbidity meter detects suspended particles and can be influenced by dissolved organics that create the water colour, and can result in an inaccurate reading. In addition, iron and manganese can contribute to water colour. Staff discussed the possibility of desalination, a dissolved air filtration plant or advanced filtration process to aid water quality issues. Consultants will

make recommendations based on data provided and help determine treatments. There have not been any toxin productions, and testing will be conducted if there is any risk of toxins.

MOVED by J. Money, **SECONDED** by A. Olsen,
The Lyall Harbour Boot Cove Water Local Service Committee receives this report for information.

CARRIED

8. CORRESPONDENCE

There was no correspondence.

9. NEW BUSINESS

Discussion ensued regarding the Alternate Approval Process scheduled for 2023 as outlined on the five year capital plan. Staff will provide further information about the process to the committee at the next scheduled meeting.

10. ADJOURNMENT

MOVED by A. Olsen, **SECONDED** by J. Sabre-Makofka,
That the February 24, 2022 meeting be adjourned at 10:47.

CARRIED

_____
CHAIR

_____
SECRETARY

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REPORT TO LYALL HARBOUR/BOOT COVE WATER LOCAL SERVICE COMMITTEE MEETING OF TUESDAY, JUNE 21, 2022

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

ISSUE SUMMARY

To provide the Lyall Harbour/Boot Cove Water Local Service Committee with capital project status reports and operational updates.

BACKGROUND

The Lyall Harbour/Boot Cove Water System is located on the west side of Saturna Island in the Southern Gulf Islands Electoral Area and provides drinking water to approximately 153 customers. Capital Regional District (CRD) Integrated Water Services is responsible for the overall operation of the water system with day-to-day operation and maintenance, design and construction of water system facilities provided by the CRD Infrastructure Engineering and Operations Divisions. The quality of drinking water provided to customers in the Lyall Harbour/ Boot Cove Water System is overseen by the CRD Water Quality Division.

CAPITAL PROJECT UPDATE

19-02 | Pressure Release Valve (PRV) Bypass Assembly Replacement

Project Description: Construct bypasses on the East Point, Narvaez and Boot Cove PRV stations to maintain system operation while the PRV's undergo maintenance.

Project Rationale: The inlet and outlet piping at the East Point, Narvaez and Boot Cove PRV stations are very corroded and there is no way to isolate the stations to replace or maintain the pressure reducing valves. It is proposed that new inlet and outlet piping be installed with 100 millimeter gate valves and bypass piping so that customers are not without water when PRV's are being serviced.

Project Update and Milestones:

- Operations to undertake the works.
- Scheduling with other maintenance work likely to occur, currently scheduled for September 2022 unless an earlier opportunity is available.
- This project has now been deferred to 2023 due to resource constraints.

22-02 | Dam Improvements & Regulatory Requirements

Project Description: Seismic reinforcement of Money Lake Dam based upon the 2016 Dam Safety Review. Includes seepage pit construction and Dam Safety Review.

Project Rationale: This is a continuation of project 18-03, where seismic reinforcement of the Money Lake Dam will commence. Funds are required to retain a contractor to undertake the works and retain a consultant to conduct the dam safety review.

Project Update and Milestones:

- The Community Works Funds (CWF) were approved in 2021 for design work to start in 2022.
- Staff are currently engaging consultants to provide quotes for design and construction services.
- Tender for aggregate supply was posted on June 10 and closes July 12, 2022.

Milestone	Completion Date
CWF Approval	October 10, 2021
Consultant RFP	February 23, 2022

OPERATIONAL UPDATE

This is an operational update reporting period from February 2022 through May 2022.

- Operational involvement with rescinding the boil water advisory. The boil water advisory issued on October 9, 2021 due to elevated treated water turbidity was discontinued on March 26, 2022.
- Significant leak detection activities performed during this period that resulted in a leak being identified on the 1.5 inch reservoir fill line.
- Draining and cleaning of the surge tank and flushing of the raw water system that includes the Money Lake supply pipe, seepage pit supply pipe and the raw water supply line along Harris Road from the surge tank to the water treatment plant.
- System leak detection activities completed over several weeks as a result of low reservoir alarms due to high water demands. As a result, several leaks were identified to be on private side of the system. This also occurred during the last reporting period.
- Initial preparation completed for inspecting the chlorine contact chamber.
- Additional water sampling requested and performed for analysis by the University of Victoria to determine the effects that water colour may have on turbidity measurements.
- Money Lake Dam maintenance that included cleaning of heavy growth within the concrete spillway channel.
- Corrective maintenance/repairs of the Money Lake recirculation line.

RECOMMENDATION

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

Submitted by:	Ian Jesney, P.Eng., Senior Manager, Infrastructure Engineering
Submitted by:	Matthew McCrank, M.Sc., P.Eng., PMP., Senior Manager, Wastewater Infrastructure Operations
Concurrence:	Ted Robbins, B.Sc., C.Tech., General Manager, Integrated Water Services

Lyall Harbour/Boot Cove Water Service

2021 Annual Report

CRD | Drinking Water

Introduction

This report provides a summary of the Lyall Harbour/Boot Cove Water Service for 2021 and includes a description of the service, summary of the water supply, demand and production, drinking water quality, operations highlights, capital project updates and financial report.

Service Description

The community of Lyall Harbour/Boot Cove is primarily a rural residential development with community and commercial properties located on Saturna Island in the Southern Gulf Islands Electoral Area which was originally serviced by a private water utility and in 1978 the service converted to the Capital Regional District (CRD). The Lyall Harbour/Boot Cove water service is made up of 171 parcels (Figure 1) encompassing a total area of approximately 100 hectares. Of the 171 parcels, 152 properties (164 Single Family Equivalent's) are connected to the water system.

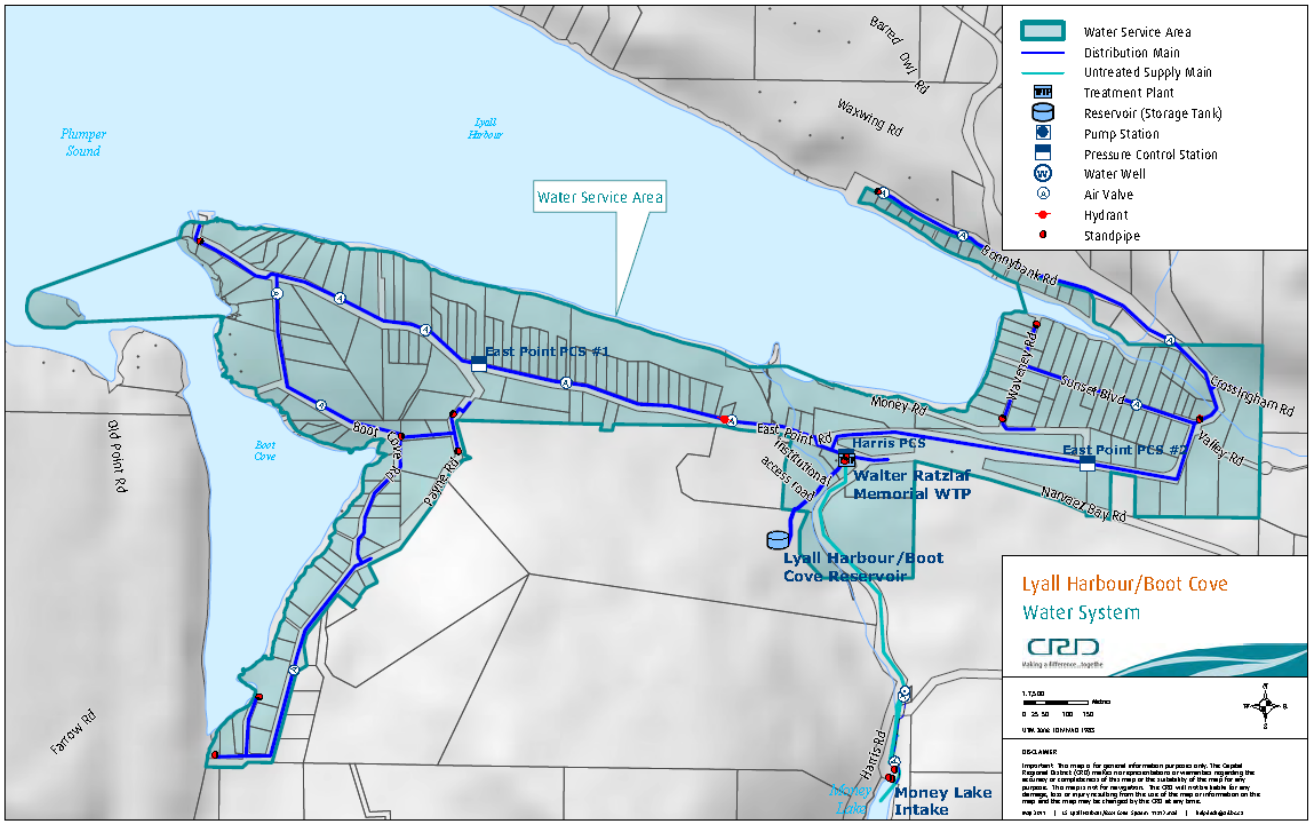

Figure 1: Map of Lyall Harbour/Boot Cove Water System

The Lyall Harbour/Boot Cove water system is primarily comprised of:

- Two raw water sources:
  - Money Lake, a small, impounded, surface water body that lies within a 94 hectare (230 acre) watershed on private land.
  - Ground water spring (seepage pit) located near the base of Money Lake Dam.
- One earthen dam structure, Money Lake Dam No. 1.
- Treatment equipment including ozonation (currently offline), two stages of filtration (granular and absorption), ultraviolet light disinfection and chlorine disinfection.
- One steel storage tank (total volume 136 cubic meters or 36,000 US gallons).
- Supervisory Control and Data Acquisition (SCADA) system.
- Distribution system and supply pipe network (8,390 meters of water mains).
- Other water system assets: 152 service connections and meters, three pressure reducing valve stations, 50 gate valves, 12 standpipes and a small auxiliary generator.

Water Supply

Referring to Figure 2 below, Money Lake monthly water levels are highlighted for 2021. Water supply levels for the year are slightly lower than 2020 but greater than historical levels. It is important to note that water supply levels in Money Lake, prior to 2008, were historically lower during the summer period. An upgrade to mitigate the low water levels involved the installation of a groundwater seepage spring recirculation pumping system. Excess water from the seepage spring is pumped back to Money Lake in order to keep the Lake as full as possible. The groundwater seepage spring water level is not monitored; however the seepage spring weekly flow rate is monitored to confirm production rate. The seepage spring typically provides 100% of the winter water system demand for the community. Money Lake water is used periodically to supplement seepage spring flows, typically during the summer dry period.

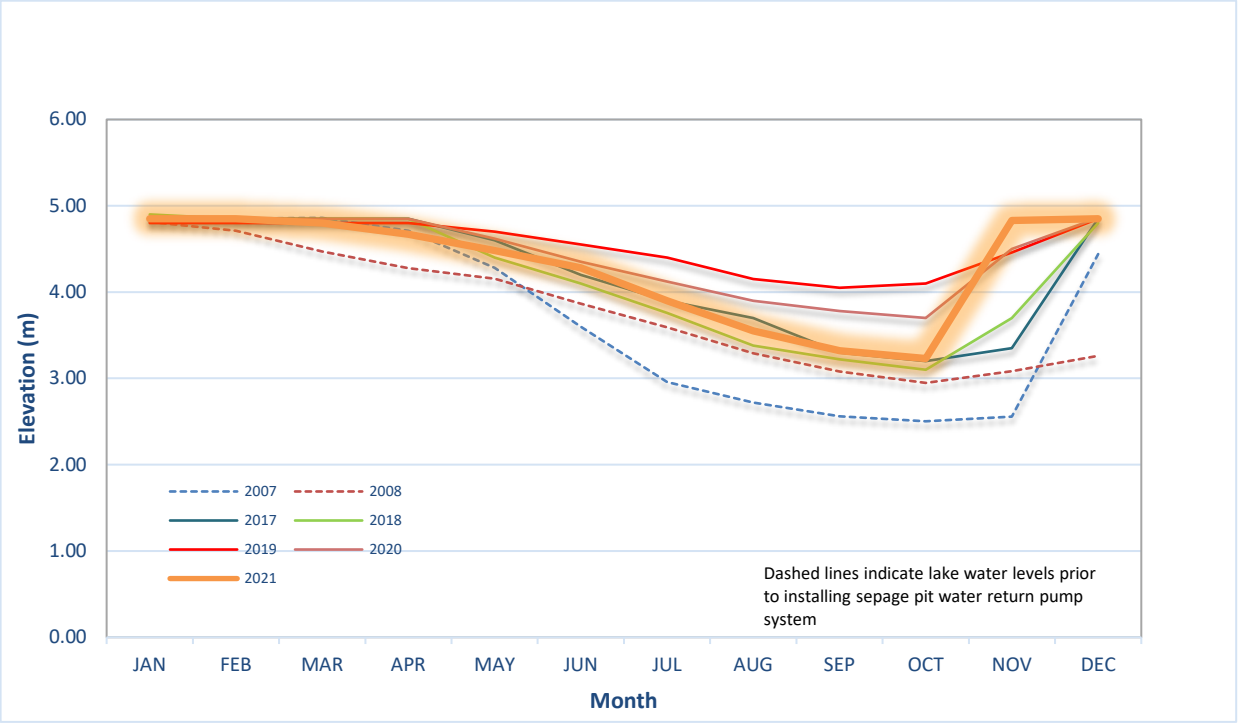

Figure 2: Money Lake Monthly Water Level

Water Production and Demand

Referring to Figure 3, 27,061 cubic meters of water was extracted (water production) from the seepage spring and Money Lake Reservoir in 2021; a 16% increase from the previous year and a 10% increase from the five year average. Water demand (customer water billing) for the service totaled 21,519 cubic meters of water; an 11% increase from the previous year and a 23% increase from the five year average.

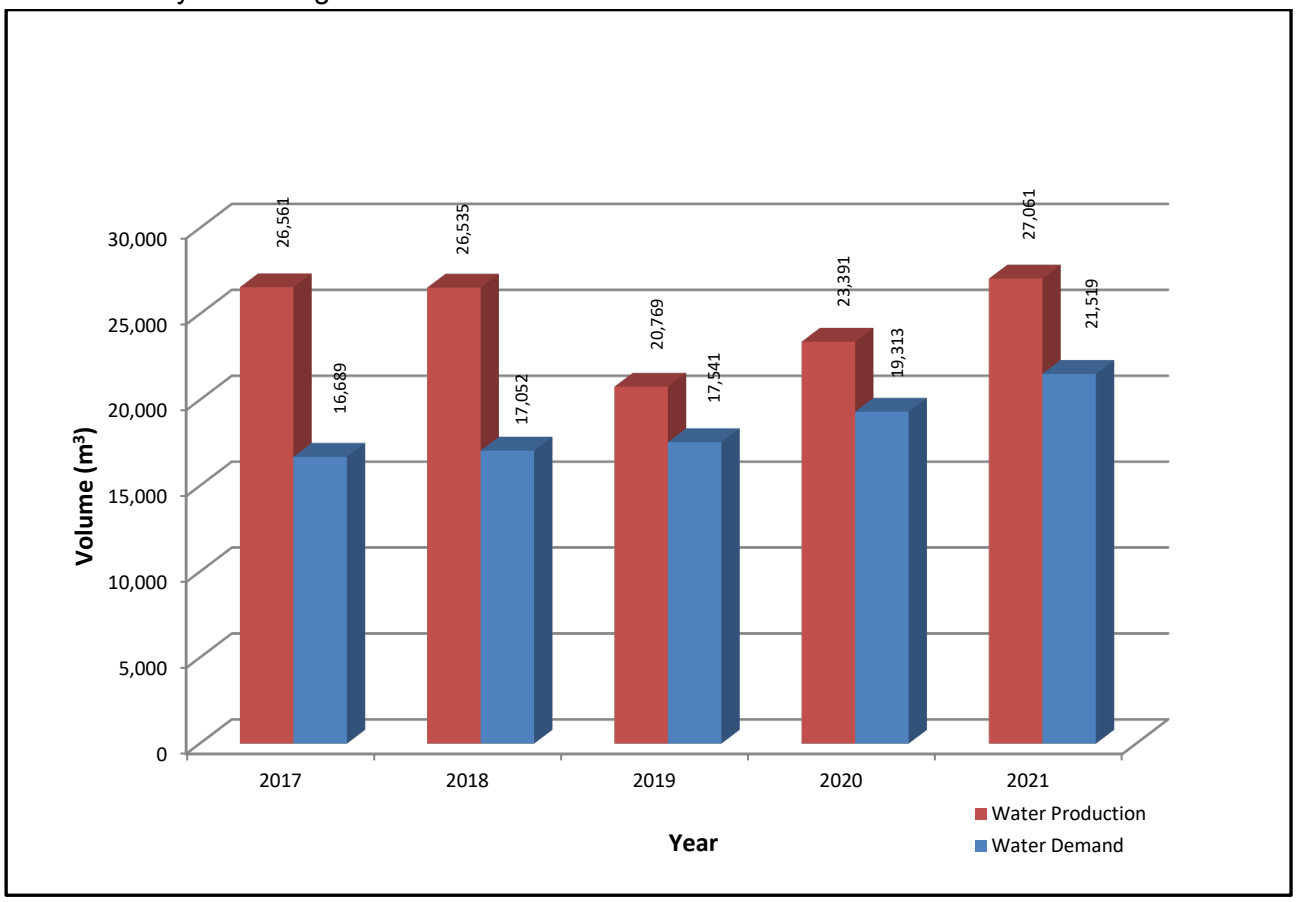

Figure 3: Lyall Harbour/Boot Cove Water System Annual Water Production and Demand

The difference between annual water production and annual customer 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 2021 non-revenue water (5,542 cubic meters) represents about 21% of the total water production for the service area. However, almost 12% of the non-revenue water can be attributed to operational use which includes water main flushing to keep chlorine residuals at acceptable levels at the extremities of the water system and water treatment filtration system backwashing activities. Therefore, the non-revenue water associated with system losses is approximately 8% which is considered acceptable for small water systems.

Figure 4 illustrates the monthly water production for 2021 along with the historical water production information. The monthly water production trends are typical for small water systems such as the Lyall Harbour/Boot Cove water system.

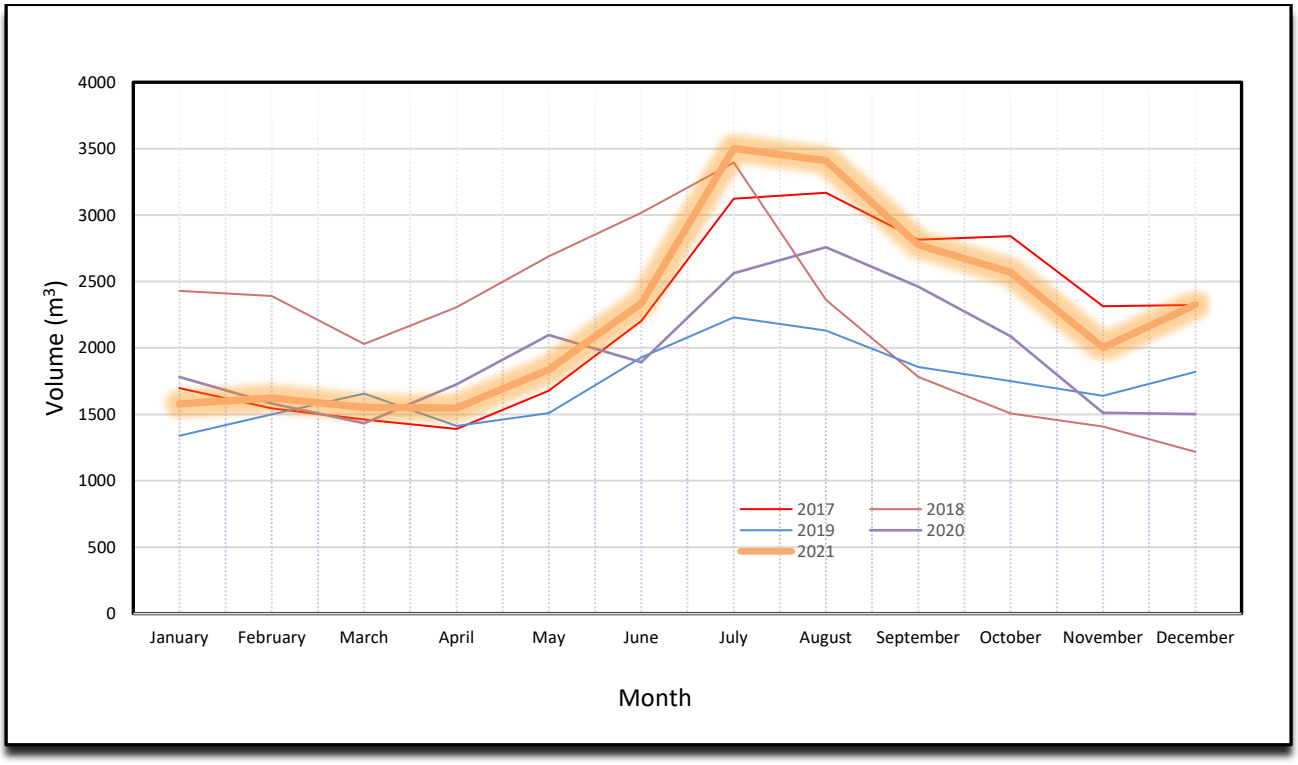

Figure 4: Lyall Harbour/Boot Cove Water Service Monthly Water Production

Drinking Water Quality

The Lyall Harbour/Boot Cove Water System uses predominantly seepage water collected from below the Money Lake dam as the primary raw water source. During the summer months this source is supplemented or completely replaced with flows from Money Lake. During summer and early fall 2021, all source water was supplied by Money Lake only, as the seepage water collection system ran dry. There is sufficient evidence to conclude that the seepage water is hydraulically connected to the lake source.

The Lyall Harbour/Boot Cove Water System had another challenging year in 2021. In total, it was under boil water advisories (BWA) for 192 days throughout the year. The first BWA was a continuation of a turbidity related event that has now developed into an annual pattern which sees the treated water turbidity starting to exceed one Nephelometric Turbidity Unit (NTU) in late fall and remaining above this threshold until the spring; typically until March. In 2021, this turbidity related BWA lasted until March 3. A second turbidity event caused another BWA from August 10 to September 24. On October 9, this aforementioned annual winter turbidity pattern set in again and necessitated another BWA that lasted into 2022. CRD staff have commenced investigations, in collaboration with scientists at the University of Victoria, to study this apparent pattern of increased turbidity readings with the onset of the wet season. There appears to be increasing evidence that dissolved organic matter may interfere with the turbidity readings. This will be studied further in 2022.

Between March and April, Money Lake was subject to an algal bloom by the diatom taxa *Synedra sp.* This bloom increased the risk of adverse taste and odour as well as accelerated filter clogging at the treatment plant. In July and August, Money Lake experienced a strong cyanobacteria bloom. Multiple cyanotoxin tests did not detect microcystin toxins in the raw water during this bloom.

These blooms did not pose a public health risk through the drinking water supplied. The annual average concentration for both regulated disinfection by-products, total Trihalomethanes (TTHM) and Haloacetic Acids (HAA), remained below the maximum acceptable concentration (MAC) in the Guidelines for Canadian Drinking Water Quality (GCDWQ). However, following the extreme rainfall and runoff event on November 14 and 15, one set of disinfection by-product samples tested at (TTHM) or slightly above (HAA) the guideline limits. This is attributable to a sudden influx of natural organic matter in the wake of this extreme weather event. This water system was under a Drinking Water Advisory for elevated disinfection by-products from September 2, 2020 to February 22, 2021. CRD had developed a disinfection by-product management plan with short-term, mid-term and long term action items. The short-term actions were implemented immediately and led to a successive reduction of the disinfection by-product concentrations. CRD remains committed to following through with mid and long-term actions to address this reoccurring issue.

The data below provides a summary of the water quality characteristics in 2021:

Raw Water:

- The raw water exhibited overall low concentrations of total coliform bacteria, with higher concentrations during the summer and early fall months when lake water was the primary water source and water temperatures were high. Throughout most of the year, the raw water entering the treatment plant contained either none or only very low concentrations of *E. coli* bacteria. Only August and September recorded some higher spikes of *E.coli* of up to 20 CFU/100mL.
- The raw water turbidity ranged from 0.2 to 10.6 NTU. The highest raw water turbidity period was during fall and winter (October to January) coinciding with the wet season. It is suspected that a higher concentration of dissolved organic matter during the wet season is a factor in the higher turbidity measurements. The median annual raw water turbidity was higher than last year with 3.69 NTU, likely due to a significant increase in turbidity sampling and testing during the adverse turbidity events throughout the year. During the spring and summer months the raw water turbidity was consistently low between 1 and 2 NTU.
- No *Giardia* cysts and no *Cryptosporidium* oocysts were detected in two sample sets in 2021.
- The raw water had naturally high concentrations of iron and manganese especially during the summer and fall season. Elevated iron and manganese concentrations are typically released during the fall turnover event in Money Lake and can be compounded by the ground passage of the seepage water. Iron concentrations were especially high following the extreme weather event on November 14 and15.
- The raw water was slightly hard (median hardness 41.2 mg/L $CaCO_3$).
- The natural total organic carbon (TOC) in the source water was relatively high (median 5.25 mg/L).

Treated Water:

- Outside the periods with a BWA, the treated water was bacteriologically safe to drink. Throughout the year, 11 samples from the distribution system tested positive for total coliform bacteria. Subsequent re-samples were negative and confirmed that no actual drinking water contamination occurred. No *E.coli* bacteria were detected in any treated water sample.
- Until the rescind notice for the disinfection by-product advisory on February 22, the water supplied by the system had to be consumed with caution as per instructions provided to the customers.

- The treated water turbidity was regularly > 1 NTU and caused the three periods with BWAs. Investigations are underway to determine if the turbidity measurements could be affected by dissolved organic matter and whether such effect constitutes a risk to the safety of the drinking water or not.
- The treated water TOC was periodically high within a range from 3.9 to 9.7 mg/L. The annual mean was 4.9 mg/L. There is currently no guideline in the GCDWQ for TOC levels, however TOC levels > 2 mg/L indicate a potential for disinfection by-product exceedances. TOC levels > 4 mg/L are usually a precursor for high disinfection by-product concentrations.
- CRD staff were able to reduce the concentrations of both TTHM and HAA in comparison to 2020. The disinfection by-product advisory was rescinded on February 22, 2021. TTHM and HAA disinfection by-product concentrations were consistently below the Health Canada MAC except for one sample on November 24 that registered a HAA concentration of 93 µg/L. However, despite this one adverse result, the annual average concentration of TTHM was 71.3 µg/L and that of HAA was 43.6 µg/L, and therefore both parameters were well below the MAC (100 µg/L and 80 µg/L respectively).
- The treated water had iron concentrations in exceedance of the aesthetic objective in a sample from November 24 following the extreme weather event on November 14 and 15. Elevated iron concentrations are not a health concern but can lead to discolouration of the drinking water which can be a nuisance for the customers. The newly established GCDWQ MAC for aluminum was not exceeded in 2021.

Table 1 and 2 below provide a summary of the 2021 raw and treated water test results.

Water quality data collected from this drinking water system can be also reviewed on the CRD website:

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

Operational Highlights

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

- Emergency response to water system leaks at:
  - 207 East Point Road
  - 112 Payne Road
- Emergency response to high treated water turbidity due to Money Lake algae bloom that resulted in a boil water advisory for the service.
- Several emergency responses to low reservoir water levels and resulting in leak detection efforts.
- Corrective maintenance on the water treatment plant flow control valve.
- Response and corrective actions to safety concerns and mold developing within the water treatment plant.
- Installation of safe work platforms above the four filter tanks in the water treatment plant. These platforms permit safe worker access for media measurement and media replacement and/or augmentation.
- Filter media was measured in late 2021 and augmented in the four filter tanks in early 2022.

- Corrective maintenance on Money Lake water recirculation line.
- Mold assessment and remediation work at the water treatment plant.
- Replacement of water treatment plant booster pump.
- Troubleshooting and corrective maintenance on the chlorine chemical feed pump and chlorine analyzer equipment.
- Relocation of chemical feed pump due to health and safety concerns.
- Emergency response due to an atmospheric weather event that caused flooding and damage to critical infrastructure.

Capital Project Updates

The Capital Projects that were started and completed in 2021 included:

1. Installation of access platforms in the water treatment plant to permit safe access to the top of the filters. This work was funded by Community Works Funds.
2. Water treatment plant ventilation and materials upgrade to ensure operations staff have a safe atmosphere in which to work inside the treatment facility. This work was funded by Community Works Funds.

Financial Report

Please refer to the attached 2021 Statement of Operations and Reserve Balances.

Revenue includes parcel taxes (Transfers from Government), fixed user fees (User Charges), interest on savings Interest earnings), transfer from Operating Reserve Fund 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 system, 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 funds for the service (Transfers to Own Funds) are deducted from this amount and are 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, 2021, the accumulated deficit was $4,737. In alignment with *Local Government Act Section 374 (11)*, if actual expenditures exceed actual revenues, any deficiency must be included in the next year's financial plan. The financial plan approved by the CRD Board on March 16, 2022 incorporated this deficit.

Submitted by:	Matt McCrank, M.Sc., P.Eng., Senior Manager, Wastewater Infrastructure Operations
	Ian Jesney, P.Eng., 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:	Ted Robbins, BSc, C.Tech, General Manager, Integrated Water Services

Attachment: 2021 Statement of Operations and Reserve Balances

For questions related to this Annual Report please email IWSAdministration@crd.bc.ca

Table 1

Table 1: 2021 Summary of Raw Water Test Results, Lyall Harbour / Boot Cove Water System									
PARAMETER		**2021 ANALYTICAL RESULTS**				**CANADIAN GUIDELINES**	**2011-2020 RESULTS**		
Parameter Name	Units of Measure	Annual Median	Samples Analyzed	Range Minimum	Range Maximum	≤ = Less than or equal to	Median	Samples Analyzed	Range Minimum-Maximum
ND means Not Detected by analytical method used									
Physical/Biological Parameters									
Carbon, Total Organic	mg/L as C	**5.25**	16	3.5	9.3		5.1	86	3.27 - 18.0
Colour, True	TCU	**22.0**	14	11.0	19.0		16	32	12.7 - 35.0
Hardness as $CaCO_3$	mg/L	**41.2**	6	35.2	44.3	No Guideline Required	43.1	65	34.7 -52.2
pH	pH units	**6.8**	2	6.7	6.8	7.0 - 10.5 AO	6.9	27	6.4 - 7.5
Turbidity, Field Tests	NTU	**3.69**	117	0.67	10.6		2.46	122	0.70 - 1.89
Turbidity, Grab Samples	NTU	**1.9**	15	0.2	5.1		1.80	110	0.60 - 20.3
Water Temperature	Degrees C	**11.0**	105	5.0	25.5	15°C AO	10.7	280	4.0 - 25.0
Metals									
Aluminum	ug/L as Al	**134.5**	6	26.1	437	2900 MAC / 100 OG	71.6	65	8.7 - 739
Antimony	ug/L as Sb	**ND**	6	ND	ND	6 MAC	ND	65	ND - 0.04
Arsenic	ug/L as As	**0.36**	6	0.26	0.67	10 MAC	0.44	65	0.22 - 7.49
Barium	ug/L as Ba	**2.45**	6	2.2	9.1	1000 MAC	3.6	65	1.47 - 40.4
Beryllium	ug/L as Be	**ND**	6	ND	ND		ND	65	ND
Bismuth	ug/L as Bi	**ND**	6	ND	ND		ND	57	ND - 0.02
Boron	ug/L as B	**ND**	6	ND	ND	5000 MAC	ND	65	1 - 420
Cadmium	ug/L as Cd	**ND**	6	ND	0.06	5 MAC	ND	65	ND
Calcium	mg/L as Ca	**10.3**	6	9.2	11.1	No Guideline Required	10.9	65	8.10 - 13.2
Chromium	ug/L as Cr	**ND**	6	ND	ND	50 MAC	ND	65	ND - 0.15
Cobalt	ug/L as Co	**ND**	6	ND	0.31		ND	65	ND - 1.38
Copper	ug/L as Cu	**2.99**	6	2.64	4.46	2000 MAC / ≤ 1000 AO	4.7	65	1.34 - 285.0
Iron	ug/L as Fe	**222**	6	135	613	≤ 300 AO	273	67	25.6 - 1960.0
Lead	ug/L as Pb	**0.30**	6	0.23	0.45	5 MAC	0.24	65	ND - 105.0
Lithium	ug/L as Li	**ND**	6	ND	ND		ND	29	ND - 20.1
Magnesium	mg/L as Mg	**3.69**	6	2.98	4.17	No Guideline Required	3.82	65	3.18 - 4.67
Manganese	ug/L as Mn	**12.55**	6	8.7	120	120 MAC / ≤ 20 AO	33.4	66	ND - 1370
Molybdenum	ug/L as Mo	**ND**	6	ND	ND		ND	65	ND - 0.07
Nickel	ug/L as Ni	**ND**	6	ND	ND		ND	65	ND - 0.35
Potassium	mg/L as K	**0.62**	6	0.54	0.74		0.66	65	0.39 - 1.36
Selenium	ug/L as Se	**ND**	6	ND	ND	50 MAC	ND	65	ND
Silicon	mg/L as Si	**7.9**	6	5.49	8.6		7.29	65	2.0 - 19.8
Silver	ug/L as Ag	**ND**	6	ND	ND	No Guideline Required	ND	65	ND
Sodium	mg/L as Na	**8.76**	6	8.17	9.63	≤ 200 AO	9.2	65	6.44 - 13.2
Strontium	ug/L as Sr	**92.3**	6	79.8	97.4	7000 MAC	96.8	65	70.0 - 120
Sulfur	mg/L as S	**3.1**	6	ND	3.5		ND	57	ND - 6.10
Tin	ug/L as Sn	**ND**	6	ND	ND		ND	65	0.05 - 65.0
Titanium	ug/L as Ti	**6.1**	6	ND	22.9		ND	65	1.44 - 65.0
Thallium	ug/L as Tl	**ND**	6	ND	ND		ND	57	ND - 0.01
Uranium	ug/L as U	**ND**	6	ND	ND	20 MAC	ND	57	ND - 0.01
Vanadium	ug/L as V	**ND**	6	ND	ND		ND	65	ND - 0.50
Zinc	ug/L as Zn	**9.3**	6	ND	17.1	≤ 5000 AO	8.7	65	ND - 258.0
Zirconium	ug/L as Zr	**0.35**	6	ND	0.57		0.17	57	ND - 0.56
Microbial Parameters									
Indicator Bacteria									
Coliform, Total	CFU/100 mL	**105**	20	6	6000		84.5	106	ND - 11
E. coli	CFU/100 mL	**ND**	21	ND	20		ND	107	ND - 10
Hetero. Plate Count, 35C (2 day)	CFU/1 mL	**2200**	2	1100	3300		620	20	ND - 2960
Parasites									
Cryptosporidium, Total oocysts	oocysts/100 L	**ND**	2	ND	ND	Zero detection desirable	0.30	21	ND - 2.80
Giardia, Total cysts	cysts/100 L	**ND**	2	ND	ND	Zero detection desirable	ND	21	ND
Algal Toxins									
Microcystin	ug/L	ND	2	ND	ND	1.5 ug/L MAC	ND	22	ND

Table 2

Table 2: 2021 Summary of Treated Water Test Results, Lyall Harbour / Boot Cove Water System									
PARAMETER		**2021 ANALYTICAL RESULTS**				**CANADIAN GUIDELINES**	**2011-2020 ANALYTICAL RESULTS**		
Parameter Name	Units of Measure	Annual Median	Samples Analyzed	Range Min.	Range Max.	≤ = Less than or equal to	Median	Samples Analyzed	Range Min.-Max.
ND means Not Detected by analytical method used									
Physical Parameters									
Carbon, Total Organic	mg/L as C	**4.90**	16	3.9	9.7		4.40	128	1.10 - 66.9
Colour, True	TCU	**9.00**	12	ND	40.0		6.60	26	2.0 - 14.0
pH	No units	Not tested in 2021				7.0 - 10.5 AO	6.80	18	6.3 - 8
Hardness	mg/L as CaCO3	**43.40**	8	41.5	44.6		43.50	47	37.2 - 50.1
Turbidity	NTU	**0.70**	20	0.25	2.90	1 MAC and ≤ 5 AO	1.01	174	0.18 - 14.0
Turbidity, Field Tests	NTU	**0.65**	106	0.14	3.89		0.73	167	0.16 - 3.31
Water Temperature	Degrees C	**12.0**	198	5.0	12.5	≤ 15 AO	12.0	1972	0.0 - 20.5
Microbial Parameters									
Indicator Bacteria									
Coliform, Total	CFU/100 mL	**ND**	151	ND	14	0 MAC	ND	700	ND - 206
E. coli	CFU/100 mL	**ND**	152	ND	ND	0 MAC	ND	700	ND - 0.30
Hetero. Plate Count, 7 day	CFU/1 mL	**3200**	39	10	24000	No Guideline Required	10	68	ND - 20000
Algal Toxins									
Algal Toxins									
Microcystin	ug/L	Not tested in 2021				1.5 ug/L MAC	ND	3	ND
Disinfectants									
Disinfectants									
Chlorine, Free Residual	mg/L as Cl2	**0.14**	192	0.01	3.00	No Guideline Required	0.27	2029	0.00 - 8.8
Chlorine, Total Residual	mg/L as Cl_2	**0.22**	77	0.02	3.50	No Guideline Required	0.50	1868	0.01 - 2.29
Disinfection By-Products									
Haloacetic Acids									
HAA5	ug/L	**37**	4	11	93	80 MAC	72.00	21	ND - 160
Trihalomethanes (THMs)									
Bromodichloromethane	ug/L	**11.5**	4	9.5	14.0		15	44	0.64 - 40.6
Bromoform	ug/L	**ND**	4	ND	ND		ND	44	ND
Chloroform	ug/L	**56.0**	4	36.0	88.0		80.0	44	7.26 - 250.0
Chlorodibromomethane	ug/L	**1.40**	4	1.1	1.60		1.63	44	ND - 31.0
Total Trihalomethanes	ug/L	**69**	4	47.0	100	100 MAC	99.5	44	7.90 - 280
Metals									
Aluminum	ug/L as Al	**46.0**	8	7.4	138	2900 MAC / 100 OG	18.5	47	7.30 - 100.0
Antimony	ug/L as Sb	**ND**	8	ND	ND	6 MAC	ND	47	ND - 0.04
Arsenic	ug/L as As	**0.37**	8	0.23	0.5	10 MAC	0.33	47	0.20 - 0.80
Barium	ug/L as Ba	**2.8**	8	2.5	4.4	1000 MAC	2.2	47	1.50 - 16.1
Beryllium	ug/L as Be	**ND**	8	ND	ND		ND	47	ND
Bismuth	ug/L as Bi	**ND**	8	ND	ND		ND	47	ND - 0.01
Boron	ug/L as B	**ND**	8	ND	ND	5000 MAC	ND	47	ND - 13.0
Cadmium	ug/L as Cd	**ND**	8	ND	ND	5 MAC	ND	47	ND - 0.09
Calcium	mg/L as Ca	**10.8**	8	10.5	11.1	No Guideline Required	11.1	47	9.55 - 13.2
Chromium	ug/L as Cr	**ND**	8	ND	ND	50 MAC	ND	47	ND
Cobalt	ug/L as Co	**ND**	8	ND	ND		ND	47	ND - 0.01
Copper	ug/L as Cu	**23.6**	8	11.5	41.5	2000 MAC / ≤ 1000 AO	31.7	47	2.14 - 595
Iron	ug/L as Fe	**95.7**	8	55.2	341	≤ 300 AO	129	49	28.8 - 1670.0
Lead	ug/L as Pb	**1.03**	8	0.43	2.36	5 MAC	1.59	47	ND - 25.8
Lithium	ug/L as Li	**ND**	4	ND	ND		ND	18	ND - 1.74
Magnesium	mg/L as Mg	**3.95**	8	3.7	4.29	No Guideline Required	3.87	47	3.20 - 4.53
Manganese	ug/L as Mn	**2.2**	8	ND	13.5	120 MAC / ≤ 20 AO	1.6	49	ND - 26.3
Molybdenum	ug/L as Mo	**ND**	8	ND	ND		ND	47	ND - 0.10
Nickel	ug/L as Ni	**ND**	8	ND	2.3		2.0	47	0.29 - 80.9
Potassium	mg/L as K	**0.62**	8	0.55	0.70		0.68	47	0.48 - 0.96
Selenium	ug/L as Se	**ND**	8	ND	ND	50 MAC	ND	47	ND - 0.12
Silicon	mg/L as Si	**6.94**	8	5.48	7.99		7.22	47	2.97 - 8.85
Silver	ug/L as Ag	**ND**	8	ND	ND	No Guideline Required	ND	47	ND
Sodium	mg/L as Na	**11.3**	8	11.2	11.9	≤ 200 AO	12.0	47	9.26 - 15.6
Strontium	ug/L as Sr	**96.4**	8	90.2	97.9	7000 MAC	97.3	47	81.5 - 121.0
Sulfur	mg/L as S	**3.1**	8	ND	3.3		ND	47	ND - 5.60
Tin	ug/L as Sn	**ND**	8	ND	ND		ND	47	ND - 47.8
Titanium	ug/L as Ti	**ND**	8	ND	9.3		ND	47	0.79 - 5.30
Thallium	ug/L as Tl	**ND**	8	ND	ND		ND	47	ND
Uranium	ug/L as U	**ND**	8	ND	ND	20 MAC	ND	47	ND - 0.01
Vanadium	ug/L as V	**ND**	8	ND	ND		ND	47	ND - 0.48
Zinc	ug/L as Zn	**26.8**	8	12.3	49.1	≤ 5000 AO	26.6	47	ND - 102.0
Zirconium	ug/L as Zr	**0.2**	8	ND	0.37		0.14	47	ND - 0.66

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CAPITAL REGIONAL DISTRICT

LYALL HARBOUR BOOT COVE WATER
Statement of Operations (Unaudited)
For the Year Ended December 31, 2021

	2021	2020
Revenue		
Transfers from government	127,738	131,030
User Charges	109,460	104,757
Other revenue from own sources:		
Interest earnings	23	5
Transfer from Operating Reserve	7,000	-
Insurance Claim Reimbursement	2,606	-
Other revenue	(864)	1,158
Total Revenue	245,963	236,950
Expenses		
General government services	7,731	7,672
CRD Labour and Operating costs	157,903	135,139
Debt Servicing Costs	30,177	31,086
Other expenses	32,786	34,083
Total Expenses	228,597	207,980
Net revenue (expenses)	17,367	28,970
Transfers to own funds:		
Capital Reserve Fund	-	10,000
Operating Reserve Fund	-	7,500
Annual surplus/(deficit)	17,367	11,470
Accumulated surplus/(deficit), beginning of year	(22,103)	(33,573)
Accumulated surplus/(deficit), end of year	$ (4,737)	(22,103)

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CAPITAL REGIONAL DISTRICT

LYALL HARBOUR BOOT COVE WATER
Statement of Reserve Balances (Unaudited)
For the Year Ended December 31, 2021

	Capital Reserve	
	2021	**2020**
Beginning Balance	23,490	6,193
Transfer from Operating Budget	-	10,000
Transfers from Completed Capital Projects	-	7,072
Transfer to Capital Projects	-	-
Interest Income	466	224
Ending Balance	23,956	23,490

	Operating Reserve	
	2021	**2020**
Beginning Balance	7,592	12
Transfer from Operating Budget	-	7,500
Transfer to Operating Budget	(7,000)	-
Interest Income	224	80
Ending Balance	815	7,592