



Making a difference...together

FERNWOOD AND HIGHLAND WATER SERVICE COMMISSION ANNUAL GENERAL MEETING

Notice of Meeting on Thursday, January 13, 2022 at 10:00 AM
Creekside Meeting Room (CRD Office) 108-121 McPhillips Avenue, Salt Spring Island, BC

Gary Holman Laura Travelbea Brian Travelbea Carollin Wentworth

Purpose of the Annual General Meeting

The agenda for the Annual General Meeting (AGM) is approved by the members of the Commission. The purposes (and hence the agenda items) of the meeting are:

- To have the last year's AGM minutes approved (by Commission members), and to present reports on the work of the Commission on the past year's operation, maintenance, capital upgrades and financial information of the service to the service residents and owners,
- To nominate members for appointment to the Commission, and
- To enable the public to share comments on subjects which relate to the work of the Commission. The Commission can identify (under "new business") issues on which it wants feedback at the meeting. Motions raised by the public at the AGM will be considered by the commission at a subsequent regular meeting.

The Annual General Meeting is for the 2020 fiscal year.

AGENDA

1. Territorial Acknowledgement / Call Meeting to Order

2. Limited Space Meeting Resolution

That this resolution applies to the Fernwood and Highland Water Service Commission for the meeting being held on January 13, 2022 and that the attendance of the public at the place of the meeting will be limited in accordance with the applicable requirements or recommendations under the Public Health Act, despite the best efforts of the Commission because:

- a. The available meeting facilities cannot accommodate more than (10) people in person, including members of the Commission and staff, and
- b. There are no other facilities presently available that will allow physical attendance of the Commission and the public in sufficient numbers; and

That the Commission is ensuring openness, transparency, accessibility and accountability in respect of the open meeting by the following means:

- a. By making the meeting agenda, as well as the other relevant documents, available on the CRD website, and directing interested persons to the website by means of the notices provided in respect of the meeting,
- b. By making the minutes of the meeting available on the CRD website following the meeting.

Zoom Link: <https://us06web.zoom.us/j/87529298452>

To ensure quorum, advise Shayla Burnham 250 537 4448 if you cannot attend.

EXEC-1295039085-2414

- 3. Approval of Agenda **1-2****
- 4. Adoption of Minutes of the 2019 Annual General Meeting held on October 29, 2020 **3-4****
- 5. Chair's Report**
- 6. Report**
 - 6.1 Annual Report for 2020 Fiscal Year **5-19****
- 7. Election of Officers**
- 8. New Business**
- 9. Next Meeting - TBD**
- 10. Adjournment**



Making a difference...together

**Minutes of the Fiscal Year 2019 Annual General Meeting of the Highland/Fernwood,
Highland and Fernwood Local Water Service Commissions
Held Thursday, October 29, 2020, Lions Hall, 103 Bonnet Ave, Salt Spring Island, BC**

DRAFT

Present: **Commission Members:** Laura Travelbea, Brian Travelbea, Director Holman
Staff: Karla Campbell, Senior Manager; Allen Xu, Manager Engineering; Matt McCrank, Senior Manager, Wastewater Infrastructure Operations; Dan Robson, Manager, Saanich Peninsula and Gulf Islands Operations; Lia Xu, Manager, Finance Services; Tracey Shaver, Recording Secretary.
Absent: Kevin Wilson

1. Territorial Acknowledgement / Call Meeting to Order

Chair L. Travelbea called the meeting to order at 11:00 am with a Territorial Acknowledgement.

2. Limited Space Meeting Resolution

MOVED by Commissioner B. Travelbea, **SECONDED** by Director Holman,
That this resolution applies to the Highland/Fernwood Water Service Commission for the meeting being held on October 29, 2020, and that the attendance of the public at the place of the meeting will be limited in accordance with the applicable requirements or recommendations under the Public Health Act, despite the best efforts of the Commission because:

- a. The available meeting facilities cannot accommodate more than (30) people in person, including members of the Commission and staff, and
- b. There are no other facilities presently available that will allow physical attendance of the Commission and the public in sufficient numbers; and

That the Commission is ensuring openness, transparency, accessibility and accountability in respect of the open meeting by the following means:

- a. By making the meeting agenda, as well as the other relevant documents, available on the CRD website, and directing interested persons to the website by means of the notices provided in respect of the meeting,
- b. By making the minutes of the meeting available on the CRD website following the meeting.

CARRIED

3. Approval of Agenda

MOVED by Commissioner L. Travelbea, **SECONDED** by Commissioner B. Travelbea,
That the combined Highland/Fernwood Water Service Commission agenda for the Fiscal Year 2019 Annual General Meeting be approved.

CARRIED

4. Adoption of Minutes of the 2018 Annual General Meeting held April 17, 2019

MOVED by Commissioner B. Travelbea, **SECONDED** by Director Holman,
That the combined Highland/Fernwood Water Service Commission meeting minutes from the FY 2018 held on April 17, 2019 be approved.

CARRIED

5. **Chair's Report-** no report

6. **Report**

6.1 **Annual Report for 2019 Fiscal Year**

- 29% loss of water if high for small system
- Three reservoirs with leaking pipes; upper reservoir is at end of life cycle (40 yrs)
- Repairs and emergency responses driving costs; little left for preventative maintenance

MOVED by Commissioner B. Travelbea, **SECONDED** by Director Holman,
That the fiscal year 2019 staff report for the combined highland/Fernwood water service
be accepted for information.

CARRIED

7. **Election of Officers**

- Requests for volunteers was advertised for 30 days in advance of AGM.
- No nominations have come forward.
- Both Laura and Brian Travelbea agreed to continue for a second term beginning in 2021.

8. **New Business** - none

9. **Adjournment**

MOVED by Director Holman, **SECONDED** by Commissioner B. Travelbea,
That the meeting be adjourned at 11:24 am.

CARRIED

CHAIR

SENIOR MANAGER

Highland Fernwood Water Service

2020 Annual Report

CRD | Drinking Water

INTRODUCTION

This report provides a summary of the Highland Fernwood Water Service for 2020. It 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 Highland Fernwood Water Service is a semi-rural residential community located on Salt Spring Island and includes servicing Fernwood Elementary School.

The Highland service was first developed in the 1970's under the name Vesuvius Holdings and was converted to the Highland Water System in 1978. It then became a CRD service in 2004.

The Fernwood service was created in the 1970's by a private developer and was converted to the Fernwood Improvement Water District in 1984. It then became a Capital Regional District (CRD) service in 1989.

Water service to Highland and Maliview was administered by the Highland Water and Sewer Local Services Commission and water service to Fernwood was administered by the Fernwood Water Local Service Commission. A single commission to administer the merged service was established in 2020.

Previously, the two water services operated on separate treatment and distribution systems both drawing water from St. Mary Lake. As of mid-September 2012, both service areas are supplied through a single water treatment plant and interconnected distribution systems. A new operating budget was established in 2013 to accommodate the single treatment plant and combined distribution systems.

The Highland Fernwood Water Service (Figure 1) is comprised of 333 parcels of land with 321 of those parcels connected to the service.

The service obtains its drinking water from St. Mary Lake, which lies within an uncontrolled multi-use watershed. The CRD holds five licenses to divert a total of up to 230,000 m³ per year and store up to 30,800 m³. St. Mary Lake is subject to seasonal water quality changes and is affected by periodic algae blooms.

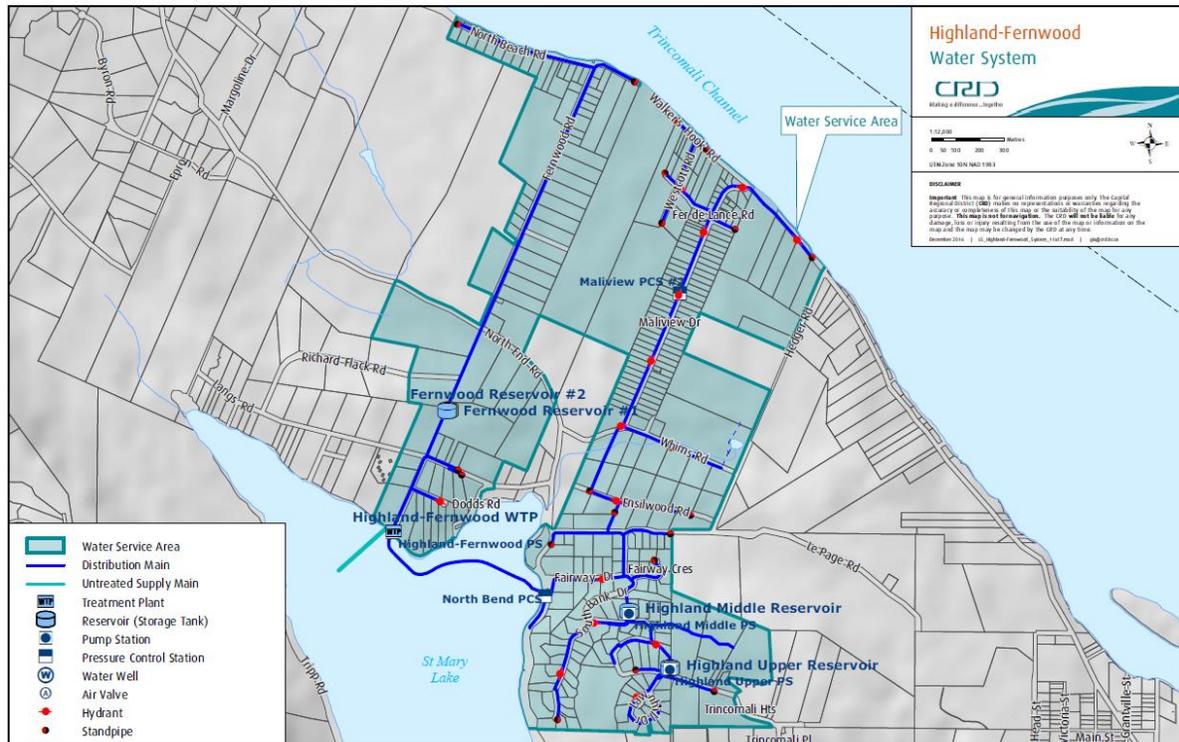


Figure 1: Highland Fernwood Water Service

The Highland Fernwood water system is primarily comprised of:

- a water treatment plant (WTP) that draws water from St. Mary Lake and treats it at a location on Maycock Road, adjacent to the lake. The water is treated using a rapid mix system, flocculation, dissolved air floatation (DAF) and filters, ultraviolet disinfection, then chlorination prior to being pumped, via the distribution system to two different reservoirs. The WTP design flow rate is 11.3 l/sec (150 lgpm);
- one raw water pump station on Maycock Road, adjacent to the lake. (flow rate of two pumps running is 4.6 l/sec (60 lgpm);
- approximately 12,000 m of water distribution pipe;
- 4 water reservoirs – one 180 m³ (40,000 lg) on the Highland system, one 91 m³ (20,000 lg) on the Highland system, one 45 m³ (10,000 lg) on the Fernwood system and, one 91 m³ (20,000 lg) on the Fernwood system;
- 2 water system booster pumps:
 - One located at the Highlands Middle Reservoir
 - One located at the Highlands Upper Reservoir
- fire hydrants, standpipes, and gate valves;
- water service connections complete with water meters;
- 2 pressure reducing valve stations - one on North End Road and one on Maliview Drive.

WATER PRODUCTION AND DEMAND

Referring to Figure 2, 78,025 cubic meters (m³) of water was extracted (water production) from St. Mary Lake in 2020; a 6% increase from the previous year and is a 5% decrease from the five year rolling average. Water demand (customer water billing) for the service totalled 49,854 m³ of water; a 2% increase from the previous year and a 2% decrease from the five year rolling average.



Figure 2: Highland Fernwood Water Service Annual Water Production and Demand

Water production by month for the past five years is shown in Figure 3. As with most water systems, water consumption follows a typical diurnal pattern where the monthly total flow peaks during the summer months. The 2019 monthly flow information is indicative of this diurnal pattern. However, for prior years it can be seen that the monthly flow trending does not follow this pattern and is indicative of water system leaks that influence and skew monthly production data.

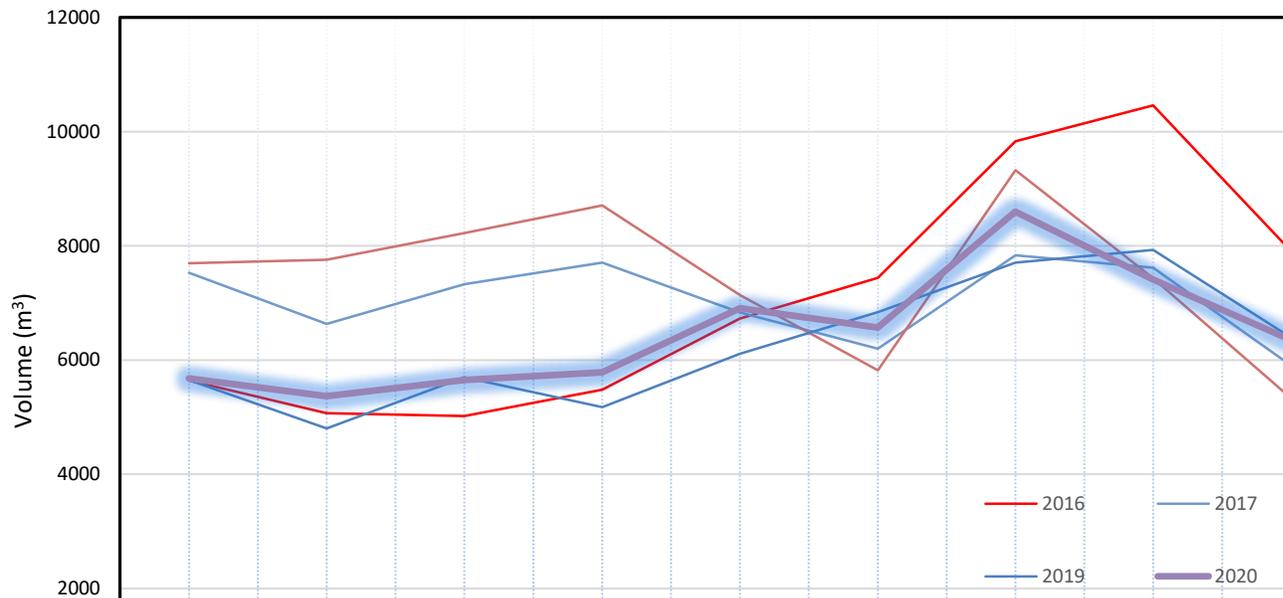


Figure 3: Highlands-Fernwood Water Service Monthly Water Production

The Highland Fernwood Water System is fully metered, and water meters are read quarterly. Water meters are manually read on a quarterly basis and the data enables water production and consumption to be compared in order to estimate leakage losses in the distribution system. The difference between water produced and water demand (total metered consumption) is called non-revenue water and includes distribution leaks, meter error, and unmetered uses such as fire hydrant usage, distribution system maintenance, and process water for the treatment plant. Non-revenue water is approximately 36%. Water loss is estimated to be approximately 32% which is considered high for a small water system such as Highland Fernwood.

WATER QUALITY

In 2020, the analytical results (biological, chemical and physical parameters) of water samples collected from the Highland Fernwood Water Systems indicated that the drinking water supplied to the customers was generally of good quality. Both, the Highland and the Fernwood distribution systems had challenges with water main breaks in 2020 that led to two Boil Water Advisories (BWA) in the Highland system (January 7 – 11 and July 17 – 31), and one BWA in the Fernwood system (June 13-15). Also, St. Mary Lake experienced a strong cyanobacteria bloom during the entire summer (May 12 – September 24) which had the potential to produce cyanotoxins. All samples taken from the intake of the Highland/Fernwood Water System tested negative for microcystin, a cyanotoxin frequently associated with such blooms. During this event, the Highland/Fernwood water treatment plant was able to produce safe and good quality drinking water. The Canadian Drinking Water Quality Guideline (GCDWQ) limit for turbidity (1 nephelometric turbidity unit (NTU)) in treated drinking water was exceeded on a number of occasions throughout the year at a few sampling stations in the Highland Distribution System, but also in the Fernwood Distribution System. These stations are typically characterized as low flow locations where particles and sediments are prone to settle in the pipes. A regular distribution pipe flushing program should address this issue.

The data below provides a summary of the water quality characteristics in 2020:

Raw Water:

- The raw water exhibited typically low concentrations of total coliform and *E. coli* bacteria throughout the cold weather periods, but much higher spikes during the summer.
- *Cryptosporidium* and *Giardia* parasites were detected in low concentrations in 2020.
- The analyses of raw water samples indicated low concentrations of iron and but elevated concentrations of manganese in the fall (November).
- The raw water was slightly hard (median hardness 38.9 mg/L CaCO₃).
- The raw water turbidity (cloudiness) was near 1 NTU during most months, but well over 1 NTU between July and October. Highest raw water turbidity was registered in July with 2.3 NTU. This was as a result of algal activity.
- A median annual total organic carbon (TOC) concentration of 3.40 mg/L confirms the mesotrophic (semi-productive) to eutrophic (productive) status of St. Mary Lake.
- The summer-long cyanobacteria bloom in St Mary Lake finally subsided in late September. Despite the strong bloom, no cyanotoxins (microcystin) were detected in the raw water entering the treatment plant in 2020.

Treated Water:

- The treated water was safe to drink outside the periods with a BWA; no indicator bacteria were detected in any Fernwood Distribution System sample throughout the year. The Highland System had 3 consecutive total coliform positive results in one sampling location (November 17, 24, 26). An investigation revealed that a bird had built a nest inside the standpipe that was used for sampling. After the standpipe was cleaned and disinfected, the samples from this location tested negative for indicator bacteria.
- The treated water turbidity was typically well below the turbidity limit of 1.0 NTU throughout the year in most parts of the system. However, a few standpipes in the Highland and also in the Fernwood system occasionally registered elevated turbidity. These low flow locations need to be flushed regularly to remove accumulated pipe sediments.
- The levels of disinfection by-products (THM) across the Fernwood and the Highland Distribution System were well below the 100 µg/L limit in the GCDWQ. Haloacetic acids (HAA) were not tested in 2020 due to a history of concentrations consistently well below the GCDWQ limit of 80 µg/L. HAA concentrations will be tested again in 2021.
- The treated water TOC in both distribution systems was lower than in previous years, ranging from 1.4 to 2.0 mg/L in the Fernwood Distribution System, and 1.3 to 2.0 mg/L in the Highland Distribution System. There is currently no guideline in the GCDWQ for TOC levels, however the USEPA suggests a treated water TOC concentration of < 2 mg/L as confirmation of effective treatment and disinfection by-product control.
- Elevated iron and/or manganese concentrations, which can lead to water discolouration, have been below the aesthetic guideline limits throughout both distribution systems.
- One sample from a standpipe in the Fernwood System exhibited elevated lead concentrations when insufficiently flushed prior to sampling.

Table 1, 2 and 3 attached below provide a summary of the 2020 raw and treated water test results.

Water Quality data collected from these two distribution systems can be reviewed on the following 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 water distribution system multiple leak detection responses.
- Water system leak repair 120 LePage Road (resulted in a boil water advisory)
- Water system leak repair 324 Fernwood Road (resulted in a boil water advisory)
- Water system leak repair 201 Ensilwood Road
- Water system leak repair 272 Maliview Drive
- Water system leak repair 150 Southbank Drive
- Water Treatment Plant booster pump corrective maintenance
- Water Treatment Plant UV system corrective maintenance
- Emergency response to clogged raw water intake system

CAPITAL IMPROVEMENTS

Fernwood and Highland Water Capital

The following is a summary of the major capital improvements including year ending spending for 2020:

Water Intake Assessment (CE.677)

Fernwood water intake has not been performing as it should. Investigation and design of a new intake was commenced by a consultant engaged by the CRD.

| Project | Spending |
|--------------------------------------|----------------|
| Budget | \$20,000 |
| Project Management | (\$1,726) |
| Design (Engineering, Drafting, etc.) | (\$9,284) |
| Balance Remaining | \$8,990 |

Safe Work Procedures (CE.699.4501)

The work scope includes reviewing and developing safe work procedures for operational and maintenance tasks.

| Project | Spending |
|--------------------------|-----------------|
| Budget | \$17,000 |
| Project Management | (\$444) |
| Contract | (\$3,177) |
| Supplies/Materials | (\$209) |
| Balance Remaining | \$13,170 |

Waste Pump Design and Construction (CE.707)

The control panel and pump for the DAF waste pump at the Highland Fernwood water treatment plant requires replacement. Investigation and design of a new waste pump will be completed by a consultant engaged by the CRD.

| Project | Spending |
|--------------------------|-----------------|
| Budget | \$80,000 |
| Project Management | (\$1,589) |
| Balance Remaining | \$78,411 |

Highland Upper Reservoir (CE.360.4655)

The Highland Upper Reservoir requires replacement. Investigation and design of a new reservoir is in progress by a consultant engaged by the CRD.

| Project | Spending |
|--------------------------|-----------------|
| Budget | \$50,000 |
| Project Management | (\$5,062) |
| Balance Remaining | \$44,938 |

2020 FINANCIAL REPORT

Please refer to the attached 2020 Financial Reports. Revenue includes parcel taxes (Transfers from Government), fixed user fees (User Charges), water Sales (Sale-Water), interest on savings (Interest Earnings), a transfer from the Operating Reserve Fund, and miscellaneous revenue such as late payment charges (Other Revenue).

Expenses includes all costs of providing the service. General Government Services includes budget preparation, financial management, utility billing and risk management services. CRD Labour and Operating Costs includes CRD staff time as well as the costs of equipment, tools and vehicles. Debt servicing costs are interest and principal payments on long term debt. Other Expenses includes 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 it is then 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, 2020, the accumulated deficit was (\$100,918) for Highland Fernwood Water Service. 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 on March 24, 2021 incorporated this deficit.

WATER SYSTEM PROBLEMS - WHO TO CALL:

To report any event or to leave a message regarding the Highland/Fernwood Water System, call either:

- CRD water system emergency call centre: 1-855-822-4426 (toll free)**
- CRD water system emergency call centre: 1-250-474-9630 (toll)**
- CRD water system general enquiries 1-800-663-4425 (toll free):**

When phoning with respect to an emergency, please specify to the operator, the service area in which the emergency has occurred.

| | |
|---------------|---|
| Submitted by: | Matthew McCrank, MSc., <u>P.Eng.</u> , Senior Manager, Wastewater Infrastructure Operations |
| | Glenn Harris, Ph.D., <u>R.P.Bio.</u> , Senior Manager, Environmental Protection |
| | Rianna Lachance, <u>B.Com.</u> , CPA, CA, Senior Manager Financial Services |
| | Karla Campbell, BPA, Senior Manager, Salt Spring Island Electoral Area |
| Concurrence | Ted Robbins, BSc, <u>C.Tech.</u> , General Manager, Integrated Water Services |

Attachment:

Table 1: 2020 Summary of Raw Water Test Results, Highland / Fernwood Water System

Table 2: 2020 Summary of Treated Water Test Results, Fernwood Distribution System

Table 3: 2020 Summary of Treated Water Test Results, Highland Distribution System

Attachment 1 2020 Financial Report - Highland/Fernwood Water

Attachment 2 2020 Financial Report -Highland Water (Debt Service)

Attachment 3 2020 Financial Report - Fernwood Water (Debt Service)

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

| Table 1: 2020 Summary of Raw Water Test Results, Highland / Fernwood Water System | | | | | | | | | |
|---|------------------|-------------------------|------------------|--------------------------|------|---------------------------|---------------------|------------------|--------------------------|
| PARAMETER | | 2020 ANALYTICAL RESULTS | | | | CANADIAN GUIDELINES | 2010 - 2019 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 | | | | | | | | | |
| Physical/Biological Parameters | | | | | | | | | |
| Carbon, Total Organic | mg/L as C | 3.40 | 4 | 2.90 | 4.30 | | 4.10 | 16 | 2.80 - 5.67 |
| Chlorophyll | ug/L | 6.8 | 1 | 6.77 | 6.77 | | 8.51 | 34 | 0.85 - 22.2 |
| Colour, True | TCU | 8.0 | 14 | 3.0 | 25 | | 6.80 | 64 | 3.7 - 10.3 |
| Hardness as CaCO ₃ | mg/L | 38.9 | 4 | 36.0 | 39.2 | No Guideline Required | 39.2 | 20 | 28.1 - 46.1 |
| pH | pH units | 8.6 | 1 | 8.6 | 8.6 | 7.0 - 10.5 AO | 7.70 | 21 | 7.18 - 8.90 |
| Turbidity | NTU | 1.10 | 17 | 0.60 | 2.30 | | 1.26 | 186 | 0.10 - 27.1 |
| Water Temperature | °C | 18.0 | 20 | 5.0 | 23.0 | 15°C AO | 14.0 | 54 | 5.0 - 24.6 |
| Microbial Parameters | | | | | | | | | |
| Indicator Bacteria | | | | | | | | | |
| Coliform, Total | CFU/100 mL | 300 | 17 | 70 | 1400 | | 63 | 137 | 0 - 6000 |
| <i>E. coli</i> | CFU/100 mL | ND | 17 | ND | 4 | | 1 | 138 | ND - 12 |
| Hetero. Plate Count, 7 day | CFU/1 mL | Last analyzed in 2013 | | | | | | | |
| Algal Toxins | | | | | | | | | |
| Microcystin (Abraxis) | ug/L | ND | 1 | ND | 0 | 1.5 | ND | 90 | ND - 1.00 |
| <i>Cryptosporidium</i> , Total oocysts | oocysts/100 L | 1 | 2 | 0.49 | 1.92 | Zero detection desirable | ND | 14 | ND - 0 |
| <i>Giardia</i> , Total cysts | cysts/100 L | ND | 2 | ND | 0.98 | Zero detection desirable | 0 | 14 | ND - 1.20 |
| Metals | | | | | | | | | |
| Aluminum | ug/L as Al | 10.25 | 4 | ND | 22.0 | 2900 MAC / 100 OG | 8 | 21 | ND - 41.8 |
| Antimony | ug/L as Sb | ND | 4 | ND | 0.0 | 6 MAC | ND | 21 | ND - 0.54 |
| Arsenic | ug/L as As | 0.41 | 4 | 0.40 | 0.67 | 10 MAC | 0.50 | 21 | ND - 0.85 |
| Barium | ug/L as Ba | 11.6 | 4 | 10.2 | 13.3 | 100 MAC | 12.10 | 21 | ND - 15.1 |
| Beryllium | ug/L as Be | ND | 4 | ND | 0.0 | | ND | 34 | ND - 0.0 |
| Bismuth | ug/L as Bi | ND | 4 | ND | 0.0 | | ND | 17 | ND - 0.0 |
| Boron | ug/L as B | ND | 4 | ND | 54.0 | 5000 MAC | ND | 21 | ND - 56.0 |
| Cadmium | ug/L as Cd | ND | 4 | ND | 0.0 | 5 MAC | ND | 21 | ND - 0.10 |
| Calcium | mg/L as Ca | 9.98 | 4 | 9.25 | 10.1 | No Guideline Required | 10.3 | 21 | 7.85 - 12.3 |
| Chromium | ug/L as Cr | ND | 4 | ND | 0.0 | 50 MAC | ND | 21 | ND - 0.0 |
| Cobalt | ug/L as Co | ND | 4 | ND | 0.0 | | ND | 21 | ND - 0.03 |
| Copper | ug/L as Cu | 1.37 | 4 | 1.11 | 1.83 | 2000 MAC / ≤ 1000 AO | 1.30 | 21 | ND - 4.55 |
| Iron | ug/L as Fe | 19.8 | 4 | 6.0 | 73.7 | ≤ 300 AO | 27.0 | 21 | ND - 176 |
| Lead | ug/L as Pb | ND | 4 | ND | 0.0 | 5 MAC | ND | 21 | ND - 0.50 |
| Lithium | ug/L as Li | 8.40 | 1 | 8.40 | 8.40 | | 8.35 | 8 | 7.50 - 11.5 |
| Magnesium | mg/L as Mg | 3.35 | 4 | 3.14 | 3.47 | No Guideline Required | 3.33 | 21 | 1.09 - 4.47 |
| Manganese | ug/L as Mn | 16.75 | 4 | 7.40 | 48.4 | 120 MAC / ≤ 20 AO | 23.4 | 21 | ND - 85.8 |
| Molybdenum | ug/L as Mo | ND | 4 | ND | 0.0 | | ND | 21 | ND - 4.40 |
| Nickel | ug/L as Ni | ND | 4 | ND | 0.0 | | ND | 21 | ND - 0.30 |
| Potassium | mg/L as K | 0.79 | 4 | 0.68 | 0.84 | | 0.82 | 21 | 0.31 - 1.62 |
| Selenium | ug/L as Se | ND | 4 | ND | 0.0 | 50 MAC | ND | 21 | ND - 0.50 |
| Silicon | ug/L as Si | 1062 | 4 | 736 | 2171 | | 1630 | 21 | 345 - 9530 |
| Silver | ug/L as Ag | ND | 4 | ND | 0.0 | No Guideline Required | ND | 34 | ND - 0.06 |
| Sodium | mg/L as Na | 19.7 | 4 | 18.1 | 20.5 | ≤ 200 AO | 20.0 | 21 | ND - 87.3 |
| Strontium | ug/L as Sr | 96.4 | 4 | 87.7 | 99.9 | 7000 MAC | 94.0 | 21 | 36.0 - 116.0 |
| Sulphur | mg/L as S | 4.80 | 4 | 4.30 | 5.60 | | 4.7 | 17 | ND - 8.70 |
| Tin | ug/L as Sn | ND | 4 | ND | 0.0 | | ND | 21 | ND - 0.0 |
| Titanium | ug/L as Ti | ND | 4 | ND | 0.0 | | ND | 21 | ND - 0.82 |
| Thallium | ug/L as Tl | ND | 4 | ND | 0.0 | | ND | 17 | ND - 0.0 |
| Uranium | ug/L as U | ND | 4 | ND | 0.0 | 20 MAC | ND | 17 | ND - 0.0 |
| Vanadium | ug/L as V | ND | 4 | ND | 0.0 | | ND | 21 | ND - 0.0 |
| Zinc | ug/L as Zn | ND | 4 | ND | 0.0 | ≤ 5000 AO | ND | 20 | ND - 136 |
| Zirconium | ug/L as Zr | ND | 4 | ND | 0.0 | | ND | 17 | ND - 0.0 |

| Table 2: 2020 Summary of Treated Water Test Results, Fernwood Distribution System | | | | | | | | | |
|---|-------------------------|-------------------------|------------------|--------------------|--------|---------------------------|---------------------|------------------|--------------------|
| PARAMETER | | 2020 ANALYTICAL RESULTS | | | | CANADIAN GUIDELINES | 2010 - 2019 RESULTS | | |
| Parameter Name | Units of Measure | Annual Median | Samples Analyzed | Range Min. Max. | | ≤ = Less than or equal to | Median | Samples Analyzed | Range Min.-Max. |
| ND means Not Detected by analytical method used | | | | | | | | | |
| Physical Parameters | | | | | | | | | |
| Hardness as CaCO ₃ | mg/L | 40.5 | 9 | 36.6 | 43.3 | | 41.0 | 181 | 35.1 - 49.1 |
| Carbon, Total Organic | mg/L as C | 1.85 | 4 | 1.40 | 2.00 | | 2.20 | 29 | ND - 9.28 |
| Colour, True | TCU | Not tested in 2020 | | | | | 1.51 | 1 | 1.51 - 1.51 |
| pH | pH units | 8.1 | 1 | 8.1 | 8.1 | | 7.50 | 1 | 7.50 - 7.50 |
| Turbidity | NTU | 0.25 | 20 | ND | 8.60 | 1 MAC and ≤ 5 AO | 0.59 | 196 | ND - 10.5 |
| Water Temperature | °C | 13.0 | 47 | 7.0 | 19.0 | 15°C AO | 14 | 157 | 0.0 - 20.5 |
| Microbial Parameters | | | | | | | | | |
| Indicator Bacteria | | | | | | | | | |
| Coliform, Total | CFU/100 mL | ND | 57 | ND | 0 | 0 MAC | ND | 218 | ND - 5 |
| <i>E. coli</i> | CFU/100 mL | ND | 57 | ND | 0 | 0 MAC | ND | 218 | ND - 0 |
| Hetero. Plate Count, 7 day | CFU/1 mL | ND | 16 | ND | 60 | No Guideline Required | 10 | 73 | ND - 800 |
| Not tested in 2020 | | | | | | | | | |
| Algal Toxins | | | | | | | | | |
| Microcystin (Abraxis) | ug/L | ND | 1 | ND | 0 | 1.5 | ND | 41 | ND - 0.0 |
| Anatoxin A | ug/L | Last analyzed in 2013 | | | | | ND | 90 | ND - 0.16 |
| Cylindrospermopsin | ug/L | Last analyzed in 2013 | | | | | ND | 90 | |
| Microcystin-RR | ug/L | Last analyzed in 2013 | | | | | ND | 93 | |
| Microcystin-YR | ug/L | Last analyzed in 2013 | | | | | ND | 90 | ND - 0.56 |
| Microcystin-LR | ug/L | Last analyzed in 2013 | | | | 1.5 MAC | ND | 90 | ND - 0.16 |
| Microcystin-LA | ug/L | Last analyzed in 2013 | | | | | ND | 26 | |
| Nodularin | ug/L | Last analyzed in 2013 | | | | | ND | 90 | |
| Disinfectants | | | | | | | | | |
| Disinfectants | | | | | | | | | |
| Chlorine, Free Residual | mg/L as Cl ₂ | 1.14 | 63 | 0.21 | 2.2 | No Guideline Required | 1.06 | 1071 | 0.20 - 3.30 |
| Chlorine, Total Residual | mg/L as Cl ₂ | 1.38 | 54 | 0.29 | 2.17 | No Guideline Required | 1.27 | 1067 | 0.01 - 4.00 |
| Disinfection By-Products | | | | | | | | | |
| Trihalomethanes (THMs) | | | | | | | | | |
| Bromodichloromethane | ug/L | 13 | 4 | 13.0 | 15 | | 13.2 | 31 | 6.94 - 28.4 |
| Bromoform | ug/L | ND | 4 | ND | 0 | | ND | 31 | ND - 0.0 |
| Chloroform | ug/L | 24.0 | 4 | 20.0 | 27.0 | | 23 | 31 | 12.7 - 115.0 |
| Chlorodibromomethane | ug/L | 4.95 | 4 | 4.7 | 5.4 | | 4.9 | 31 | 2.19 - 32.1 |
| Total Trihalomethanes | ug/L | 45 | 4 | 37.0 | 47 | 100 MAC | 42 | 30 | 23.0 - 145.0 |
| Haloacetic Acids (HAAs) | | | | | | | | | |
| HAA5 | ug/L | Not analyzed in 2020 | | | | 80 MAC | 10.75 | 6 | ND - 22.2 |
| Metals | | | | | | | | | |
| Aluminum | ug/L as Al | 7.7 | 9 | 4.1 | 389.0 | 2900 MAC / 100 OG | 13.2 | 18 | 5.70 - 219.0 |
| Antimony | ug/L as Sb | ND | 9 | ND | 0.0 | 6 MAC | ND | 18 | ND - 0.0 |
| Arsenic | ug/L as As | 0.28 | 9 | 0.2 | 0.8 | 10 MAC | 0.32 | 18 | 0.20 - 0.55 |
| Barium | ug/L as Ba | 11.5 | 9 | 9.9 | 13.1 | 100 MAC | 12.3 | 18 | 10.7 - 16.4 |
| Beryllium | ug/L as Be | ND | 9 | ND | 0.0 | | ND | 18 | ND - 0.0 |
| Bismuth | ug/L as Bi | ND | 9 | ND | 0.0 | | ND | 18 | ND - 0.0 |
| Boron | ug/L as B | ND | 9 | ND | 51.0 | 5000 MAC | ND | 18 | ND - 53.0 |
| Cadmium | ug/L as Cd | ND | 9 | ND | 0.0 | 5 MAC | ND | 18 | ND - 0.02 |
| Calcium | mg/L as Ca | 10.6 | 9 | 9.5 | 12.1 | No Guideline Required | 11.05 | 18 | 8.90 - 15.3 |
| Chromium | ug/L as Cr | ND | 9 | ND | 0.0 | 50 MAC | ND | 18 | ND - 0.0 |
| Cobalt | ug/L as Co | ND | 9 | ND | 0.0 | | ND | 18 | ND - 0.23 |
| Copper | ug/L as Cu | 8.49 | 9 | 3.0 | 75.9 | 2000 MAC / ≤ 1000 AO | 4.10 | 18 | 1.50 - 25.2 |
| Iron | ug/L as Fe | 34.2 | 9 | 19.6 | 224.0 | ≤ 300 AO | 57.85 | 18 | 23.7 - 770.0 |
| Lead | ug/L as Pb | 0.57 | 9 | 0.3 | 6.71 | 5 MAC | 0.49 | 20 | ND - 78.1 |
| Lithium | ug/L as Li | 8.1 | 3 | 7.7 | 11.7 | | | | |
| Magnesium | mg/L as Mg | 3.16 | 9 | 2.9 | 3.4 | No Guideline Required | 2.95 | 18 | 2.52 - 3.57 |
| Manganese | ug/L as Mn | 1.6 | 9 | ND | 150.0 | 120 MAC / ≤ 20 AO | 7.05 | 18 | ND - 145.0 |
| Molybdenum | ug/L as Mo | ND | 9 | ND | 0.0 | | ND | 18 | ND - 0.0 |
| Nickel | ug/L as Ni | ND | 9 | ND | 0.0 | | ND | 18 | ND - 0.0 |
| Potassium | mg/L as K | 0.77 | 9 | 0.7 | 0.8 | | 0.78 | 18 | 0.76 - 0.87 |
| Selenium | ug/L as Se | ND | 9 | ND | 0.0 | 50 MAC | ND | 18 | ND - 0.0 |
| Silicon | ug/L as Si | 1310 | 9 | 796 | 1940.0 | | 1550 | 18 | 405 - 3700 |
| Silver | ug/L as Ag | ND | 9 | ND | 0.0 | No Guideline Required | ND | 18 | ND - 0.0 |
| Sodium | mg/L as Na | 22.4 | 9 | 19.9 | 23.3 | ≤ 200 AO | 22.6 | 18 | 19.8 - 25.2 |
| Strontium | ug/L as Sr | 99.4 | 9 | 87.1 | 104.0 | 7000 MAC | 94.9 | 18 | 88.2 - 106.0 |
| Sulphur | mg/L as S | 4.2 | 9 | 3.9 | 5.4 | | 4.85 | 18 | 3.80 - 5.40 |
| Tin | ug/L as Sn | ND | 9 | ND | 0.0 | | ND | 18 | ND - 0.0 |
| Titanium | ug/L as Ti | ND | 9 | ND | 0.0 | | ND | 18 | ND - 0.0 |
| Thallium | ug/L as Th | ND | 9 | 0.0 | 0.04 | | ND | 18 | ND - 0.04 |
| Uranium | ug/L as U | ND | 9 | ND | 0.0 | 20 MAC | ND | 18 | ND - 0.0 |
| Vanadium | ug/L as V | ND | 9 | ND | 0.0 | | ND | 18 | ND - 0.0 |
| Zinc | ug/L as Zn | 20.8 | 9 | 10.7 | 37.3 | ≤ 5000 AO | 16.2 | 18 | 5.60 - 76.2 |
| Zirconium | ug/L as Zr | ND | 9 | ND | 0.0 | | ND | 18 | ND - 0.0 |

| Table 3: 2020 Summary of Treated Water Test Results, Highland Distribution System | | | | | | | | | |
|---|-------------------------|-------------------------|-----------------------|-----------------|--------|-------------------------|---------------------|------------------|-----------------|
| PARAMETER | | 2020 ANALYTICAL RESULTS | | | | CANADIAN GUIDELINES | 2010 - 2019 RESULTS | | |
| Parameter Name | Units of Measure | Annual Median | Samples Analyzed | Range Min. Max. | | ≤ Less than or equal to | Median | Samples Analyzed | Range Min.-Max. |
| ND means Not Detected by analytical method used | | | | | | | | | |
| Physical Parameters | | | | | | | | | |
| Hardness as CaCO ₃ | mg/L | 42.5 | 8 | 36.9 | 48.6 | | 43 | 26 | 34.1 - 54.9 |
| Carbon, Total Organic | mg/L as C | 1.80 | 12 | 1.30 | 2.00 | | 1.95 | 64 | ND - 19.7 |
| Colour, True | TCU | | Not tested in 2020 | | | | 1.95 | 2 | 1.80 - 2.10 |
| pH | pH units | 7.40 | 4 | 7.30 | 8.10 | | 6.96 | 15 | 6.55 - 7.57 |
| Turbidity | NTU | 0.18 | 52 | ND | 2.10 | 1 MAC and ≤ 5 AO | 0.40 | 476 | ND - 37.8 |
| Water Temperature | °C | 13.0 | 144 | 5.0 | 22.6 | 15°C AO | 12.7 | 411 | 0.0 - 24.5 |
| Microbial Parameters | | | | | | | | | |
| Indicator Bacteria | | | | | | | | | |
| Coliform, Total | CFU/100 mL | ND | 179 | ND | 209 | 0 MAC | ND | 1065 | ND - 106 |
| <i>E. coli</i> | CFU/100 mL | ND | 179 | ND | 0 | 0 MAC | ND | 1065 | ND - 1 |
| Hetero. Plate Count 7 day | CFU/1 mL | | Not tested in 2020 | | | No Guideline Required | 30 | 58 | ND - 310 |
| Algal Toxins | | | | | | | | | |
| Microcystin (Abraxis) | ug/L | ND | 1 | ND | 0 | 1.5 | ND | 41 | ND - 0.0 |
| Anatoxin A | ug/L | | Last analyzed in 2013 | | | | ND | 85 | ND - 0.0 |
| Cylindrospermopsin | ug/L | | Last analyzed in 2013 | | | | ND | 85 | ND - 0.0 |
| Microcystin-RR | ug/L | | Last analyzed in 2013 | | | | ND | 84 | ND - 0.0 |
| Microcystin-YR | ug/L | | Last analyzed in 2013 | | | | ND | 85 | ND - 0.58 |
| Microcystin-LR | ug/L | | Last analyzed in 2013 | | | 1.5 MAC | ND | 85 | ND - 0.51 |
| Microcystin-LA | ug/L | | Last analyzed in 2013 | | | | ND | 28 | ND - 0.0 |
| Nodularin | ug/L | | Last analyzed in 2013 | | | | ND | 85 | ND - 0.0 |
| Disinfectants | | | | | | | | | |
| Disinfectants | | | | | | | | | |
| Chlorine, Free Residual | mg/L as Cl ₂ | 1.29 | 194 | 0.20 | 2.20 | No Guideline Required | 0.85 | 3928 | ND - 5.30 |
| Chlorine, Total Residual | mg/L as Cl ₂ | 1.43 | 174 | 0.34 | 2.20 | No Guideline Required | 1.08 | 3930 | 0.02 - 9.10 |
| Disinfection By-Products | | | | | | | | | |
| Trihalomethanes (THMs) | | | | | | | | | |
| Bromodichloromethane | ug/L | 15.5 | 8 | 14.0 | 25.0 | | 17.0 | 62 | ND - 31.9 |
| Bromoform | ug/L | ND | 8 | ND | 0.0 | | ND | 62 | ND - 4.20 |
| Chloroform | ug/L | 27.5 | 8 | 24.0 | 62.0 | | 32.8 | 63 | 6.41 - 127.0 |
| Chlorodibromomethane | ug/L | 5.65 | 8 | 4.90 | 9.40 | | 5.99 | 63 | ND - 31.7 |
| Total Trihalomethanes | ug/L | 51.0 | 8 | 44.0 | 92.0 | 100 MAC | 56.1 | 60 | 14.6 - 161.0 |
| Haloacetic Acids (HAAs) | | | | | | | | | |
| HAA5 | ug/L | | Not tested in 2020 | | | 80 MAC | 18.2 | 12 | 9.21 - 37.7 |
| Metals | | | | | | | | | |
| Aluminum | ug/L as Al | 14.85 | 8 | 6.2 | 41.2 | 2900 MAC / 100 OG | 15.75 | 26 | 4.50 - 58.8 |
| Antimony | ug/L as Sb | ND | 8 | ND | 0.0 | 6 MAC | ND | 26 | ND - 0.0 |
| Arsenic | ug/L as As | 0.28 | 8 | 0.2 | 0.5 | 10 MAC | 0.29 | 26 | 0.20 - 0.51 |
| Barium | ug/L as Ba | 11.1 | 8 | 6.7 | 12.1 | 100 MAC | 11.8 | 26 | 7.50 - 14.6 |
| Beryllium | ug/L as Be | ND | 8 | ND | 0.0 | | ND | 26 | ND - 0.0 |
| Bismuth | ug/L as Bi | ND | 8 | ND | 0.0 | | ND | 26 | ND - 0.0 |
| Boron | ug/L as B | ND | 8 | ND | 53.0 | 5000 MAC | ND | 26 | ND - 51.0 |
| Cadmium | ug/L as Cd | ND | 8 | ND | 0.0 | 5 MAC | ND | 26 | ND - 0.0 |
| Calcium | mg/L as Ca | 12.4 | 8 | 9.5 | 16.8 | No Guideline Required | 13.1 | 26 | 8.57 - 19.1 |
| Chromium | ug/L as Cr | ND | 8 | ND | 0.0 | 50 MAC | ND | 26 | ND - 0.0 |
| Cobalt | ug/L as Co | ND | 8 | ND | 0.0 | | ND | 26 | ND - 0.0 |
| Copper | ug/L as Cu | 3.89 | 8 | 2.0 | 5.7 | 2000 MAC / ≤ 1000 AO | 5.69 | 26 | 2.49 - 19.5 |
| Iron | ug/L as Fe | 35.1 | 8 | ND | 237.0 | ≤ 300 AO | 58.85 | 26 | ND - 591.0 |
| Lead | ug/L as Pb | ND | 8 | ND | 0.4 | 5 MAC | 0.35 | 26 | ND - 3.62 |
| Lithium | ug/L as Li | 8.1 | 2 | 8.1 | 8.1 | | 7.35 | 2 | 7.30 - 7.40 |
| Magnesium | mg/L as Mg | 2.73 | 8 | 1.0 | 3.5 | No Guideline Required | 2.70 | 26 | 1.12 - 3.70 |
| Manganese | ug/L as Mn | 2.45 | 8 | ND | 14.2 | 120 MAC / ≤ 20 AO | 3.15 | 26 | ND - 57.9 |
| Molybdenum | ug/L as Mo | ND | 8 | ND | 0.0 | | ND | 26 | ND - 0.0 |
| Nickel | ug/L as Ni | ND | 8 | ND | 0.0 | | ND | 26 | ND - 0.0 |
| Potassium | mg/L as K | 0.76 | 8 | 0.7 | 0.85 | | 0.80 | 26 | 0.72 - 0.90 |
| Selenium | ug/L as Se | ND | 8 | ND | 0.0 | 50 MAC | ND | 26 | ND - 0.0 |
| Silicon | ug/L as Si | 1375 | 8 | 706 | 2020.0 | | 1735 | 26 | 322 - 3490 |
| Silver | ug/L as Ag | ND | 8 | ND | 0.0 | No Guideline Required | ND | 26 | ND - 0.0 |
| Sodium | mg/L as Na | 22.5 | 8 | 21.0 | 23.0 | ≤ 200 AO | 22.45 | 26 | 19.3 - 25.4 |
| Strontium | ug/L as Sr | 98.55 | 8 | 90.8 | 104.0 | 7000 MAC | 101.0 | 26 | 87.0 - 115.0 |
| Sulphur | mg/L as S | 4.55 | 8 | 4.1 | 5.3 | | 4.95 | 26 | 3.80 - 5.90 |
| Tin | ug/L as Sn | ND | 8 | ND | 0.0 | | ND | 26 | ND - 0.0 |
| Titanium | ug/L as Ti | ND | 8 | ND | 0.0 | | ND | 26 | ND - 0.0 |
| Thallium | ug/L as Th | ND | 8 | ND | 0.0 | | ND | 26 | ND - 0.0 |
| Uranium | ug/L as U | ND | 8 | ND | 0.0 | 20 MAC | ND | 26 | ND - 0.0 |
| Vanadium | ug/L as V | ND | 8 | ND | 0.0 | | ND | 26 | ND - 0.0 |
| Zinc | ug/L as Zn | 14.65 | 8 | ND | 20.9 | ≤ 5000 AO | 11.2 | 26 | ND - 42.1 |
| Zirconium | ug/L as Zn | ND | 8 | ND | 0.0 | | ND | 26 | ND - 0.0 |

CAPITAL REGIONAL DISTRICT

HIGHLAND / FERNWOOD WATER
Statement of Operations (Unaudited)
For the Year Ended December 31, 2020

| | 2020 | 2019 |
|---|---------------------|----------------|
| Revenue | | |
| Transfers from government | 56,822 | 55,000 |
| User Charges | 283,083 | 275,469 |
| Sale - Water | 55,805 | 39,495 |
| Other revenue from own sources: | | |
| Insurance claim reimbursement | 4,250 | - |
| Interest earnings | - | 62 |
| Transfer from Operating Reserve Fund | 34,262 | 31,612 |
| Other revenue | 1,492 | 1,154 |
| Total Revenue | 435,715 | 402,791 |
| Expenses | | |
| General government services | 16,822 | 15,659 |
| Contract for Services | 21,102 | 11,474 |
| CRD Labour and Operating costs | 273,289 | 234,570 |
| Debt Servicing Costs | 41,351 | 41,364 |
| Other expenses | 117,480 | 80,724 |
| Total Expenses | 470,043 | 383,791 |
| Net revenue (expenses) | (34,328) | 19,000 |
| Transfers to own funds: | | |
| Capital Reserve Fund | 47,210 | - |
| Operating Reserve Fund | 19,380 | 19,000 |
| Annual surplus/(deficit) | (100,918) | - |
| Accumulated surplus/(deficit), beginning of year | - | - |
| Accumulated surplus/(deficit), end of year | \$ (100,918) | - |

CAPITAL REGIONAL DISTRICT

HIGHLAND / FERNWOOD WATER Statement of Reserve Balances (Unaudited) For the Year Ended December 31, 2020

| | Capital Reserve | |
|---|-----------------|---------------|
| | 2020 | 2019 |
| Beginning Balance | 55,892 | 103,201 |
| Transfer from Operating Budget | 47,210 | - |
| Transfers from Completed Capital Projects | - | - |
| Transfer to Capital Project | (80,000) | (53,024) |
| Interest Income | 2,643 | 5,715 |
| Ending Balance | 25,744 | 55,892 |

| | Operating Reserve | |
|--------------------------------|-------------------|---------------|
| | 2020 | 2019 |
| Beginning Balance | 17,345 | 28,840 |
| Transfer from Operating Budget | 19,380 | 19,000 |
| Transfer to Operating Budget | (34,262) | (31,612) |
| Interest Income | 356 | 1,116 |
| Ending Balance | 2,818 | 17,345 |

CAPITAL REGIONAL DISTRICT

HIGHLAND WATER
Statement of Operations (Unaudited)
For the Year Ended December 31, 2020

| | 2020 | 2019 |
|---|----------------|---------------|
| Revenue | | |
| Transfers from government | 30,514 | 36,840 |
| Other revenue from own sources: | | |
| Interest earnings | 34 | 94 |
| Other revenue | 108 | 119 |
| Total Revenue | 30,656 | 37,053 |
| Expenses | | |
| General government services | 876 | 1,456 |
| Debt Servicing Costs | 30,866 | 34,560 |
| Total Expenses | 31,742 | 36,016 |
| Net revenue (expenses) | (1,086) | 1,037 |
| Annual surplus/(deficit) | (1,086) | 1,037 |
| Accumulated surplus/(deficit), beginning of year | 1,120 | 83 |
| Accumulated surplus/(deficit), end of year | \$ 33 | 1,120 |

CAPITAL REGIONAL DISTRICT

FERNWOOD WATER
Statement of Operations (Unaudited)
For the Year Ended December 31, 2020

| | 2020 | 2019 |
|---|-----------------|---------------|
| Revenue | | |
| Transfers from government | 16,138 | 18,980 |
| Other revenue from own sources: | | |
| Interest earnings | 25 | 43 |
| Other revenue | 53 | 58 |
| Total Revenue | 16,216 | 19,081 |
| Expenses | | |
| General government services | 821 | 1,373 |
| CRD Labour and Operating costs | - | - |
| Debt Servicing Costs | 14,646 | 17,300 |
| Total Expenses | 15,467 | 18,673 |
| Net revenue (expenses) | 749 | 408 |
| Annual surplus/(deficit) | 749 | 408 |
| Accumulated surplus/(deficit), beginning of year | 451 | 43 |
| Accumulated surplus/(deficit), end of year | \$ 1,200 | 451 |