

# 2019-20

Twenty-Fourth  
**Annual Report**  
March 31, 2020





## Our Vision

We will provide our customers with high quality water, wastewater, and stormwater services.

Through adoption of best practices, we will place the highest value on public health, customer service, fiscal responsibility, workplace safety and security, asset management, regulatory compliance, and stewardship of the environment.

We will fully engage employees through teamwork, innovation, and professional development.

## Our Mission

To provide world-class services for our customers and our environment.

Cover Page:

Photos of our past work, current projects, and planning for the future as Halifax Water celebrates 75 Years of Service.



## Board of Commissioners

March 31, 2020



**Craig MacMullin, MBA, CPA, CGA**  
Chair



**Councillor Russell Walker,**  
Vice Chair



**Cathie O'Toole, MBA, FCPA, FCGA, ICD.D**  
General Manager



**Louis de Montbrun, CPA, CA**  
Director, Corporate Services/  
CFO



**Brad Anguish,**  
Commissioner



**Colleen Rollings, P.Eng.**  
Commissioner



**Jamie Hannam, MBA, P.Eng.**  
Director, Engineering &  
Information Services



**Kenda MacKenzie, P.Eng.**  
Director, Regulatory Services



**Ted Farquhar, P.Eng., CPA**  
Commissioner



**Councillor Steve Adams,**  
Commissioner



**Susheel Arora, M.A.Sc., P.Eng.**  
Director, Wastewater &  
Stormwater Services



**Reid Campbell, M.Eng., P.Eng.**  
Director, Water Services



**Councillor Richard Zurawski,**  
Commissioner



**Councillor David Hendsbee,**  
Commissioner



## Letter from the Chair

January 1, 2020 marked the 75<sup>th</sup> anniversary of Halifax Water. Originally known as the Public Service Commission, it was later renamed Halifax Water Commission in 1987, then Halifax Water on August 1, 2007.

The 2019/20 fiscal year brought many challenges and opportunities for Halifax Water in the pursuit of its mission to provide world-class services for our customers and our environment.



**Craig MacMullin**  
Board Chair

The year saw turnover in key leadership positions, including the Board Chair, General Manager, General Counsel, and Director of Corporate Services/Chief Financial Officer. The utility also successfully managed the emergency replacement of a large combined sewer on Chisholm Avenue, triggered by a sinkhole, and some localized flooding caused by post-tropical storm Erin; voluntary water conservation measures for customers served by Lake Major; maintained critical services through Hurricane Dorian; navigated supply chain risks caused by the CN Rail blockades; and the emergence of COVID-19 as a global pandemic. The value of having formalized emergency management and enterprise risk management plans were demonstrated through many of these events.

Throughout the response to COVID-19, Halifax Water staff were on the front line maintaining essential services that allow homes, buildings, hospitals, long-term care facilities, breweries and industry to operate, provide water for fire protection, and kept wastewater and stormwater systems running to help protect our environment and public and private property. Staff kept these critical systems running while working safely and taking steps to benefit and assist our customers.

On behalf of the Halifax Water Board, I wish to convey to customers our commitment to providing responsible governance and oversight in the provision of water, wastewater and stormwater service by Halifax Water. To the employees of Halifax Water, particularly the front-line workers, I wish to extend my sincere appreciation for your service.

A handwritten signature in black ink, reading "Craig MacMullin".

Craig MacMullin, Chair of the Board



# 75 Years of Service



Cathie O'Toole  
General Manager

As Halifax Water celebrates its 75<sup>th</sup> anniversary, it did so in the face of what can be considered one of the most challenging years in its history. Despite that, the utility met its obligations under the HRWC Act and Public Utilities Act, maintained compliance with its operating permits, and staff worked to keep customers in essential water, wastewater and stormwater service during a number of major weather events and a global pandemic.

Last year, Halifax Water continued to focus on delivery of capital projects and long-range planning, recognizing that there are significant short and long-term investments to make in ageing infrastructure. Halifax Water continued to conduct research with Dalhousie University to take a long-term view on optimization of the water and wastewater systems, with a particular focus on adjusting to the unintended consequences of lake recovery in response to a decrease in acid rain and meeting the wastewater system effluent regulations in 2040. Changing source water conditions and meeting wastewater system effluent regulations in 2040 will both have a significant impact on future capital requirements

for water and wastewater service, respectively. We are very pleased that through the partnership with Dalhousie University that funding for wastewater research was secured in 2019/20 through the Natural Sciences and Engineering Research Council of Canada (NSERC). Having these on-going science-based research projects, and our linkage to the municipality's HalifACT 2050 initiative will help Halifax Water with its on-going programs and infrastructure investments as we adapt to and prepare for the impacts of climate change.

This year was one of the best on record for delivery of the capital program. Halifax Water completed \$94.3 million in capital projects and had \$18 million in capital assets under construction at the end of the year. The projects completed during the year include Advanced Metering Infrastructure (\$16.6 million), J. D. Kline Filtration Replacement (\$10.3 million), Lake Major Dam Replacement (\$9 million), Lucasville Transmission Main Twinning (\$6.4 million), Ellenvale Run Retaining Wall System (\$6 million), Wanda Lane Storm Sewer (\$4.9 million), Corporate Flow Monitoring (\$1.6 million) and \$39 million in various other smaller capital projects and programs.

Several important strategic initiatives that will guide our future activities were completed, including an updated Five-Year Business Plan, a proposal for an Enhanced Lead Service Line Replacement Program, an updated Integrated Resource Plan (IRP) and Regional Development Charge (RDC). These activities supported applications to the Nova Scotia Utility and Review Board (NSUARB) to adjust some rates to keep the utility on a sound financial footing. In light of COVID-19, Halifax Water substantially adjusted the rate increases requested and is now seeking to maintain the rates for water service for the next two fiscal years. A rate increase for wastewater service (April 1, 2021) and the Regional Development Charge (fall/winter 2020) are still required.

Cost containment remains a priority for the utility with an intentional focus on sustainable results over the long term. New cost containment initiatives implemented during the 2019/20 fiscal year resulted in cost savings of \$0.7 million.

The 2019 Halifax Water Employee Survey results improved from a B to a B+, and the Customer Survey results indicated 96% of customers were very or somewhat satisfied with Halifax Water's Overall Service Delivery. There is a direct linkage to these results as a satisfied and engaged workforce is key to delivering a high standard of customer service.

All Halifax Water employees contributed to the positive outcomes achieved in 2019/20 described in this report. It was a privilege to lead the team at Halifax Water through a challenging year in 2019/20.

Thank you for your service!

Cathie O'Toole, General Manager



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J. D. Kline Water Supply  
Plant Pumping Station on  
Pockwock Lake



Wind Farm Supplying Clean,  
Renewable Energy to the  
Local Distribution Grid,  
Community & J. D. Kline WSP

## Get in touch!

### 24-Hour Emergency Line:

902-420-9287

### Website

halifaxwater.ca

### Customer Care Centre

Hours of Operation:

Monday - Friday

8:00 AM - 8:00 PM

customer@halifaxwater.ca

902-420-9287

Office Hours:

Monday - Friday

8:30 AM - 4:30 PM

450 Cowie Hill Road

Halifax, NS

### Social Media

Monitored:

Monday - Friday

8:30 AM - 4:30 PM

Twitter: @HalifaxWater

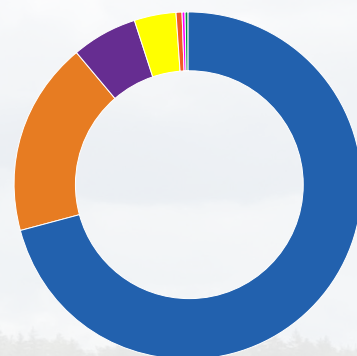
Facebook: @HalifaxWater

YouTube: @HalifaxWater

LinkedIn: HalifaxWater

## Halifax Water Customers by Service

Halifax Water provides one or more of the following services to our customers: water, wastewater and stormwater. See the table below for a breakdown of the number of customers who receive each type/combination of services.



Customer Numbers by Type		
March 31, 2020 (Fiscal Year: 2019/2020)		
	Number of Accounts	Percentage of Total
Water, Wastewater & Stormwater	74 617	70.93%
Stormwater Only	19 021	18.08%
Water & Wastewater	6 468	6.15%
Water & Stormwater	4 093	3.89%
Wastewater & Stormwater	640	0.61%
Water Only	288	0.27%
Wastewater Only	78	0.07%
<b>Total of All Types</b>	<b>105 205</b>	<b>100%</b>



# General Information of Utility

Year Ended March 31, 2020

## Water

Water Supply Plant	Water Source	Treatment Process	Design Average Flows/Day	Filter Quantity & Capacity/Day	Maximum Flow Rate	Design Capacity/Day
J. D. Kline	Pockwock Lake	Dual Media Direct Filtration & Manganese Removal	84 230 m <sup>3</sup>	8 Filters 143 m <sup>2</sup> /filter	0.137 m <sup>3</sup> /m <sup>2</sup> per minute	227 000 m <sup>3</sup>
Lake Major	Lake Major	Upflow Clarification, Iron & Manganese Removal	33 840 m <sup>3</sup>	4 Filters 85 m <sup>2</sup> /filter	0.192 m <sup>3</sup> /m <sup>2</sup> per minute	94 000 m <sup>3</sup>
Bennery Lake	Bennery Lake	Sedimentation, Dual Media Filtration & Manganese Removal	956 m <sup>3</sup>	2 Filters 26.65 m <sup>2</sup> /filter	0.10 m <sup>3</sup> /m <sup>2</sup> per minute	7 950 m <sup>3</sup>
Middle Musquodoboit	Musquodoboit River	Raw Water Infiltration Gallery, Ultra/Nano Filtration	48 m <sup>3</sup>	2 Ultra Filters 1 Nano Filter	0.139 m <sup>3</sup> /min 0.264 m <sup>3</sup> /min	260 m <sup>3</sup>
Collins Park	Lake Fletcher	Ultra/Nano Filtration	40 m <sup>3</sup>	2 Ultra Filters 1 Nano Filter	0.111 m <sup>3</sup> /min 0.145 m <sup>3</sup> /min	160 m <sup>3</sup>
Bomont	Shubenacadie River	Nano Filtration/ Ionic Exchange Resin	8 m <sup>3</sup>	N/A	0.0132 m <sup>3</sup> /min	38 m <sup>3</sup>
Silver Sands	2 Wells	Green Sand Pressure Filters, Iron & Manganese Removal	27 m <sup>3</sup>	2 Filters	0.378 m <sup>3</sup> /min	30 m <sup>3</sup>
Five Island Lake	1 Well	UV Disinfection	8 m <sup>3</sup>	N/A	0.016 m <sup>3</sup> /min	N/A

Source Water	Rainfall in 2019-20	Snowfall in 2019-20
Pockwock Lake	1305.0 mm	163.9 cm
Lake Major	1407.5 mm	158.0 cm

Source Water	Watershed Area	Safe Yield /Day
Pockwock Lake	5 661 ha	145 500 m <sup>3</sup>
Chain Lake	206 ha	4 500 m <sup>3</sup>
Lake Major	6 944 ha	65 900 m <sup>3</sup>
Lake Lemont/ Topsail	346 ha	4 500 m <sup>3</sup>
Bennery Lake	644 ha	2 300 m <sup>3</sup>

Water Supply	Water Production in 2019-20
Pockwock Lake	28 278 461 m <sup>3</sup>
Lake Major	11 696 950 m <sup>3</sup>
Bennery Lake	284 521 m <sup>3</sup>
Small Systems	41 171 m <sup>3</sup>
<b>Total</b>	<b>40 301 103 m<sup>3</sup></b>

Water Reservoir	Elevation Above Sea Level	Capacity
Lake Major	60 m	9 092 m <sup>3</sup>
Pockwock	170 m	13 600 m <sup>3</sup>
Geizer 158	158 m	36 400 m <sup>3</sup>
Geizer 123	123 m	31 800 m <sup>3</sup>
Cowie	113 m	11 400 m <sup>3</sup>
Robie	82 m	15 900 m <sup>3</sup>
Lakeside	119 m	5 455 m <sup>3</sup>
Mount Edward 1	119 m	22 728 m <sup>3</sup>
Mount Edward 2	119 m	22 728 m <sup>3</sup>
Akerley Blvd.	119 m	37 727 m <sup>3</sup>
North Preston	125 m	1 659 m <sup>3</sup>
Meadowbrook	95 m	9 091 m <sup>3</sup>
Sampson	123 m	12 273 m <sup>3</sup>
Stokil	123 m	23 636 m <sup>3</sup>
Waverley	86 m	1 364 m <sup>3</sup>
Middle Musq.	81 m	275 m <sup>3</sup>
Aerotech	174 m	4 085 m <sup>3</sup>
Beaver Bank	156 m	6 937 m <sup>3</sup>
<b>Total</b>		<b>259 213 m<sup>3</sup></b>

Transmission & Distribution System	
Size of Water Mains	19 mm - 1 500 mm
Total Water Mains	1 563 km
Main Valves	15 746
Fire Hydrants	8 453
Distribution Pumping (Booster) Stations	21
Pressure Control & Flow Meter Chambers	141

Water Services & Meters	
Water Sprinkler Systems (25 mm - 300 mm)	2 204
Supply Services (10 mm - 400 mm)	85 466
Water Meters (15 mm - 250 mm)	85 140

Population Served	
Halifax Municipality Est. Population Served	376 000
Consumption per Capita	238 litres/day

# General Information of Utility

Year Ended March 31, 2020

## Wastewater/Stormwater

Wastewater Treatment Facility	Treatment Process	Design Average Flows/Day	Area(s) Served	Receiving Water	Volume Treated in 2019-20
Halifax	Enhanced Primary UV	139 900 m <sup>3</sup>	Halifax	Halifax Harbour	33 284 787 m <sup>3</sup>
Dartmouth	Enhanced Primary UV	83 800 m <sup>3</sup>	Dartmouth	Halifax Harbour	20 259 836 m <sup>3</sup>
Herring Cove	Enhanced Primary UV	28 500 m <sup>3</sup>	Halifax & Herring Cove	Halifax Harbour	4 088 956 m <sup>3</sup>
Mill Cove	Secondary UV/Pure Oxygen Activated Sludge	28 400 m <sup>3</sup>	Bedford & Sackville	Bedford Basin	10 929 599 m <sup>3</sup>
Eastern Passage	Secondary UV/Conventional Activated Sludge	25 000 m <sup>3</sup>	Cole Harbour & Eastern Passage	Halifax Harbour	5 639 200 m <sup>3</sup>
Timberlea	Secondary Sodium Hypochlorite/RBC	4 540 m <sup>3</sup>	Lakeside & Timberlea	Nine Mile River	1 002 400 m <sup>3</sup>
Aerotech	Tertiary UV/Membrane Bioreactors	3 000 m <sup>3</sup>	Aerotech Park & Airport	Johnson River	328 874 m <sup>3</sup>
Springfield Lake	Secondary UV/Activated Sludge	543 m <sup>3</sup>	Springfield Lake	Lisle Lake	143 504 m <sup>3</sup>
Fall River	Tertiary UV/Activated Sludge & Post Filtration	454.5 m <sup>3</sup>	Lockview Road & McPherson Road	Lake Fletcher	59 060 m <sup>3</sup>
North Preston	Tertiary UV/SBR & Engineered Wetland	680 m <sup>3</sup>	North Preston	Winder Lake	215 157 m <sup>3</sup>
Middle Musquodoboit	UV/RBC	114 m <sup>3</sup>	Middle Musquodoboit	Musquodoboit River	40 421 m <sup>3</sup>
Uplands Park	Secondary UV/Trickling Filter & Wetland	91 m <sup>3</sup>	Uplands Park	Sandy Lake	37 168 m <sup>3</sup>
Wellington	Tertiary UV/Activated Sludge/Reed Bleed	68 m <sup>3</sup>	Wellington	Grand Lake	6 684 m <sup>3</sup>
Frame Subdivision	Tertiary UV/Membrane Reactor	80 m <sup>3</sup>	Frame Subdivision	Lake William	9 442 m <sup>3</sup>

Wastewater & Stormwater Collection System			
Size of Pipes	50 mm - 3 000 mm	Total Ditch Length	602 km
Total Collection System Length	2 303 km	Holding Tanks & Retention Ponds	45
Wastewater Services	81 803	Cross Culverts	2 369
Total Manholes	38 895	Driveway Culverts	Approx. 16 000
Total Pumping Stations	165	Catchbasins	24 538

Glossary of Terms
ha - hectare
m - metre
m <sup>2</sup> - square metre
m <sup>3</sup> - cubic metre (1 000 litres)
mm - millimetre
cm - centimetre
km - kilometre



# HIGH QUALITY WATER





# Lake Recovery

Lakes in Nova Scotia typically have a low pH and, in some cases, a resulting low level of biotic activity. This was believed to be caused by acid rain from prevailing westerly winds bringing coal-burning power plant emissions to Nova Scotia from the Midwest United States.

Great strides have been taken over the last 20 years in both Canada and the US in reducing emissions from coal-fired power generation. This has allowed lakes to recover from the effects of acid rain, resulting in higher pH, higher levels of naturally occurring organic matter in the water, and higher levels of biotic activity. While this is a good news story from an environmental perspective, the source water has changed enough to present treatment challenges that our plants were not designed for.

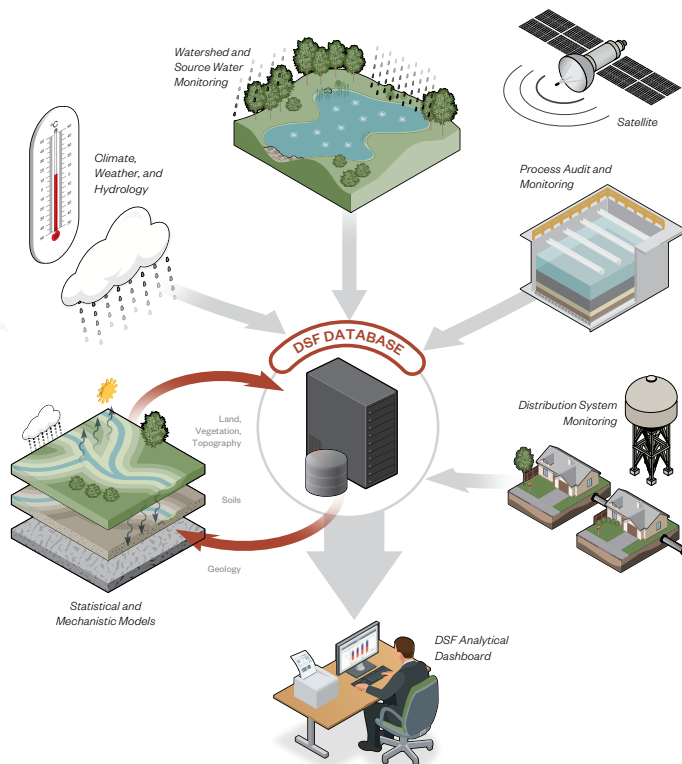
In 2018, Halifax Water began a Tailored Collaboration Program project with the Water Research Foundation (WRF) to assist the utility in dealing with the implications of lake recovery. This program offers matching research funding of US\$100,000 from the WRF to better understand and monitor source water changes, how to optimize water supply plants and develop a capital improvement plan to manage changing source water quality.

The research is being conducted by Hazen and Sawyer, who have assembled a team of source water, water treatment and water quality experts to develop a decision support framework. The project will conclude in 2020 and will be used to guide Halifax Water in planned upgrades to our large water supply plants.

## Decision Support Framework (DSF)

Responding to Changing Water Quality due to Lake Recovery and Climate Change

The proposed DSF will leverage existing data and system resources to enable a unified approach to data analysis and visualization that supports robust decision-making across planning horizons (near-term operations support to long-term capital planning)



### How does lake recovery impact our customers?

Lake recovery has caused geosmin to appear in our source water. Geosmin is a harmless, naturally occurring compound that gives water an earthy smell and taste.

One teaspoon of geosmin in an olympic swimming pool would be enough for a human to taste and/or smell it.



**Research Fund Matched up to US \$100,000 by WRF**



**Developing a Plan to Manage & Treat Changing Source Waters**



**Project to Guide Future WSP Upgrades Complete in 2020**

#### Funding Sources:

Halifax Water Rates & Water Research Foundation



# Algal Monitoring

Cyanobacteria (blue-green algae) are naturally found in our lakes and streams. There are thousands of species of cyanobacteria, and they are a natural part of the ecosystem. Some cyanobacteria species can produce taste and odour compounds like geosmin and MIB (2-Methylisoborneol), and some species can also produce algal toxins, like microcystins.

Due to lake recovery and climate change's combined effects, the biological activity in many lakes in Nova Scotia is changing. Halifax Water first noticed this in 2012 with the detection of geosmin at Pockwock Lake. In response to the changing source water, Halifax Water has developed and implemented an algal toxin monitoring program, which is in line with industry best practices. This program is multi-pronged and makes use of several different early warning and pre-screening tools to allow proactive responses to algal blooms and any potential water quality impacts. Through both the NSERC Research Chair with Dalhousie University and the National Research Council, Halifax Water is working on developing innovative tools for algal monitoring to enhance understanding and response to algal blooms further.

Algae as Seen  
Through a Microscope

## NSERC Research Chair with Dalhousie University

This year marked the 13<sup>th</sup> successful year of our research partnership with the National Sciences and Engineering Research Council (NSERC) Halifax Water Industrial Research Chair in Water Quality and Treatment at Dalhousie University. Dalhousie and Halifax Water work cooperatively to develop a five-year research framework to meet both Halifax Water's operational needs and to address broader sector-wide needs for water quality and treatment.

The current research plan has three main themes:

- Understanding Lake Recovery: to understand the water quality changes occurring in our water supply lakes and appropriately design water treatment plant upgrades.
- Treatment Research and Source Water Monitoring: to adapt current treatment processes to changing source water.
- Distribution System Water Quality: Strategies for dealing with lead in drinking water and optimizing corrosion control treatment.

In 2020, public health protocols in response to COVID-19 meant that existing pilot and lab-based projects had been temporarily put on hold.

Still, the research team seized the opportunity to develop several targeted projects using literature reviews and review of existing data sources to assist Halifax Water in decision making around current operational challenges, including enhancing source water monitoring approaches, optimizing algal monitoring approaches and gaining a further understanding of corrosion control best practices.



Dr. Graham Gagnon, Ph.D., P.Eng.  
NSERC/Halifax Water Industrial Research Chair

## WSP Upgrade Program

All of our water supply plants (WSPs) continue to provide high-quality drinking water that exceeds Health Canada requirements, but doing so is costing more and requires greater effort from our operations and maintenance staff.

This year, Halifax Water began a program to upgrade both of our large water supply plants at Pockwock Lake and Lake Major over the next ten years. Halifax Water will be upgrading to more modern technology and upgrading the treatment processes to ensure the plants are capable of meeting tomorrow's treatment challenges. Both plants will be more resilient to better enable them to meet treatment challenges arising out of lake recovery and climate change.

Significantly, the J. D. Kline plant will be upgraded from a direct filtration plant to a conventional plant, which will better enable it to respond to changes in source water.



# Lead Line Replacement Program

Removing lead service lines from our water system is a top priority for Halifax Water.

For decades, Halifax Water has been working together with the public to remove lead water service lines (LSL) from our system. On August 22, 2017, the NSUARB approved a financial incentive for customers who replace their private LSL. The program provides a 25% rebate, up to \$2,500 of the cost of the private replacement. Halifax Water has since developed The Lateral Loan, which assists customers who cannot secure a private loan but wish to replace their LSL.

## Program Success



**Customer Private LSL Replacements:**

128 in 2019-20.  
340 since 2017.



**Halifax Water Public LSL Replacements:**

103 in 2019-20.  
300 since 2017.



**\$197,552 in Rebates Paid to Customers by Halifax Water for 212 LSL Replacements since August 22, 2017.**



**Customers with known LSLs are alerted and offered assistance.**



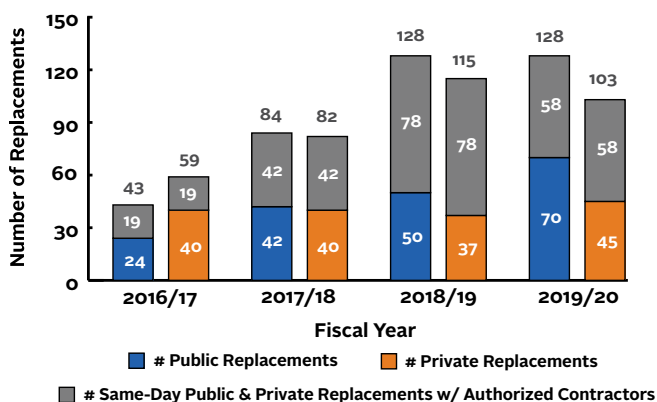
**Coordination with HRM to integrate LSL replacements during HRM street improvements.**

## Project Cost & Funding

**Total Cost:**  
\$2,592,502 (Since 2017)

**Funding Source:**  
Halifax Water Rates

**Public & Private Lead Service Line Replacements**



Referring to the bar graph, a steady rise in replacement numbers can be seen until a slight decline in 2019/2020. Despite the success of the current program there are still significant barriers to private uptake and at the current rate of replacement, the program will run well past the program goal of 2050.

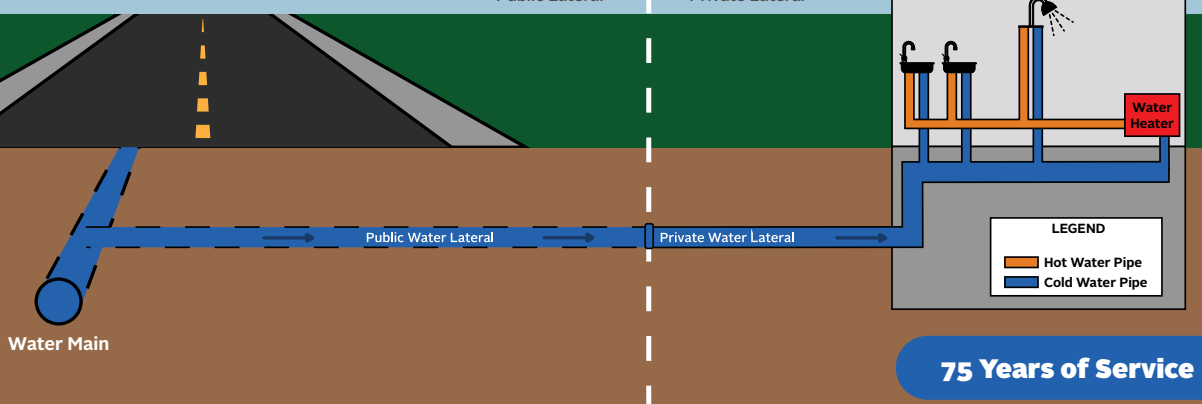
## Property Line

### Public Property

Halifax Water's Responsibility  
Public Lateral

### Private Property

Homeowner's Responsibility  
Private Lateral





# Lead Line Replacement Program Continued...

## Path Forward

To further remove barriers to private LSL replacements and expedite the program timeline, in February 2020, two separate submissions were made to the NSUARB requesting the ability to conduct lead service renewals from the water main to the water meter, at the expense of Halifax Water.

1. The first application requested the ability to replace lead service lines from the main to the meter at utility expense for several capital projects for the 2020 construction season, namely Berlin Street, Drummond Court, and Leaman Street. These streets are undergoing planned water main renewals, which requires disconnection of service from the existing water main and reconnection to the new water main, thus resulting in disturbance to lead service lines. This application was approved in March 2020, and the Berlin Street project is taking place in 2020. The Drummond Court And Leaman Street projects have been postponed until 2020/2021.
2. On November 28, 2019, the Halifax Water Board of Commissioners approved a staff report which included a request for changes to the Halifax Water Rules & Regulations to allow for utility payment of both the public and private portions of the service line. Several programs were proposed, including replacements through integration with HRM paving projects, customer-initiated renewal programs, and targeted programs for sensitive communities or high-density areas. A corresponding application was submitted to the Nova Scotia Utility and Review Board in February 2020, as part of the general rate application. A major benefit of the proposed enhancements includes providing Halifax Water with control of the replacement timeline. Annual replacements can be scaled to match budget availability, and program replacement goals will be in Halifax Water's control as opposed to relying on private uptake in the program. New timelines for project completion with the proposed enhancements are 2039 compared to the current goal of 2050, which is not achievable at the current uptake rate. We are currently awaiting a response from the NSUARB regarding this application.

### Editorial Note

On August 27, 2020, the NSUARB approved this enhanced program.

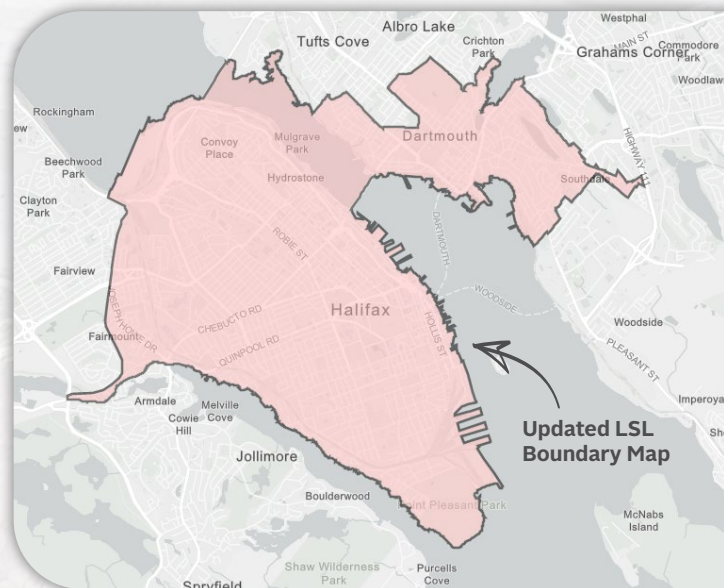




## Lead Service Line Boundary & Inventory

In February 2018, Halifax Water digitized a boundary encompassing peninsular Halifax, old sections of water distribution infrastructure connecting to the Chain Lake Water Supply Plant (now a back-up water supply), and the area of Dartmouth within the boundary of the Highway of Heroes (Hwy #111). Halifax Water was conservative in its approach to publishing a lead service line boundary at the time due to the uncertainty in private service records regarding the service line material composition. With the completion of the water meter installation portion of the Customer Connect project, consultation with staff, and use of historical records, a more accurate boundary was determined.

On January 10, 2020, the lead service line boundary was modified and published for public reference.



Halifax Water has been working to improve its inventory of lead service lines through several means, including refining the boundary as described above, gathering information during the Customer Connect project, and through a property-by-property consolidation of physical and digital records. Through these efforts, in 2020, Halifax Water reduced the 2017 inventory estimate from 2,500 public and 10,000+ private lead service lines to 2,000 public and 3,500 private lead service lines.



# RESPONSIBLE FINANCIAL MANAGEMENT

A close-up photograph of a person's hands working on a desk. The right hand is holding a silver pen and pointing at a calculator. The left hand is resting on a desk. In the foreground, there is a calculator and a spreadsheet with various numbers and formulas. The background is blurred, showing a person's face and a window with light coming in.

## Annual Financial Results

Halifax Water received a clean audit opinion on the financial statements for the fiscal year ended March 31, 2020. The financial statements are presented in accordance with International Financial Reporting Standards (IFRS). Halifax Water also produces financial information in the format required by the Nova Scotia Utility and Review Board (NSUARB) in accordance with the NSUARB Accounting and Reporting Handbook for Water Utilities (Handbook).

The financial statements prepared under IFRS are used primarily for consolidation with the Halifax Regional Municipality's financial statements. In contrast, the financial information prepared under the Handbook is used for setting Water, Wastewater and Stormwater rates.

Summary financial information is presented on page 66 under IFRS and under the Handbook on page 67.

The audited financial statements are audited by Grant Thornton LLP and can be located at [halifaxwater.ca/publications-reports](http://halifaxwater.ca/publications-reports). The financial statements contain the independent auditor's report issued by Grant Thornton, IFRS statements and schedules containing financial information prepared in accordance with the Handbook.

The key differences between the IFRS and Handbook financial statements are related to reporting requirements for the recognition of various expenditures as follows:

1. The full actuarial liability of employee future benefits is not considered an expense for the Handbook and could result in either positive or negative impacts on income;
2. Principal payments on long-term debt are an expense for the Handbook but not under IFRS;
3. Depreciation expense on contributed assets is not an expense for the Handbook and amortization of contributed capital is not considered revenue under the Handbook; and,
4. Various depreciation adjustments, including the add-back of losses on the disposal of utility plant in service, componentization of assets and shorter useful lives, results in higher depreciation under IFRS than under the Handbook.

Under IFRS, comprehensive earnings are \$20.90M. After the adjustments described above, the loss for the year under the Handbook is \$1.56M. The key differences are summarized in the table on this page.

Reconciliation IFRS Results to Handbook Results		
	March 31, 2020 '000	March 31, 2019 '000
<b>IFRS comprehensive earnings</b>	<b>\$ 20,899</b>	<b>\$ 16,138</b>
Add non-cash pension expense	8,381	6,208
Subtract debt principle appropriation expense	(18,719)	(20,516)
Add depreciation expense on contributed assets	19,025	18,143
Subtract amortization on contributed capital	(19,025)	(18,143)
Add various depreciation adjustments	2,635	3,292
Subtract OCI gain	(14,756)	(3,734)
<b>NSUARB earnings (loss) for the year</b>	<b>\$ (1,560)</b>	<b>\$ 1,388</b>



# Annual Financial Results Continued...

## Cash Balance

On par with last year, higher than projected as a result of Regional Development Charges (RDC) collections & lower capital expenditures.

**\$50.0M**

The liquidity on the balance sheet (ratio of current assets divided by current liabilities) is 1.76 (per NSUARB Handbook reporting).

## New Assets Capitalized in the Fiscal Year

Utility plant in services assets, net of accumulated depreciation, are \$1,281.0M and is \$46.6M or 3.86% higher than last year.

**\$94.3M**

At the end of the fiscal year, there was \$18.1M in capital work in progress, compared to \$29.6M last year.

Debt continues to be an important funding source for Halifax Water's capital program. Total long-term debt increased to \$219.1M. New debt of \$30.0M was received

## Expenditures on Capital Projects in the Fiscal Year

Meters and associated technology related to the Advanced Metering Infrastructure (AMI) project were capitalized along with other significant projects, including the J. D. Kline Filtration Replacement project and the replacement of the Lake Major Dam.

**\$69.3M**

in November 2019, and repayments during the year were \$18.2M.

## Debt Service Ratio

Well below the maximum ratio allowed under the blanket guarantee agreement with HRM.

**18.91%**

The discussion of operating results is based on the Handbook as these are the results on which rates are based. The loss for the year was \$1.56M and a decrease of \$2.95M from last year.

## Actual Loss

From a budget perspective, the loss for the year was below budget by \$6.8M.

**\$1.56M**

This lower than expected loss was due to operating expenses and debt servicing being less than expected.

## Utility Plant in Service Additions

	Cumulative '000
AMI - Advanced Metering Infrastructure	\$ 16,604
J. D. Kline Filtration Replacement	10,299
Lake Major Dam Replacement	9,080
Lucasville Transmission Main Twinning	6,398
Ellensvale Run Stormwater Channel Upgrades	6,027
Wanda Lane Storm Sewer	4,935
All other projects	40,979
<b>Total</b>	<b>\$94,322</b>

## Capital Work in Progress

	Cumulative '000
Integrate Service Desk & IT Asset Management	\$793
Pump Station Control Panel/Electrical Replacement	926
Infrastructure & IT Ops Governance	1,054
Payroll Replacement Project	1,192
Fairview/Clayton Park/Bridgeview I&I Reduction	1,078
All other projects	13,061
<b>Net assets under construction</b>	<b>\$29,605</b>

## Summarized Consolidated Operating Results

For the year ended	March 31, 2020 '000	March 31, 2019 '000	\$ Change
Operating revenues	\$ 137,750	\$ 138,202	\$ (452)
Operating expenses	109,326	105,524	3,802
Earnings from operations	28,424	32,678	(4,254)
Financial & other revenues	1,211	1,899	(688)
Financial & other expenditures	31,195	33,189	(1,994)
<b>Earnings (loss) for the year</b>	<b>\$ (1,560)</b>	<b>\$ 1,388</b>	<b>\$ (2,948)</b>

## Summarized Consolidated Operating Results - Comparison to Budget

For the year ended	Budget March 31, 2020 '000	Actual March 31, 2019 '000	\$ Change
Operating revenues	\$ 138,727	\$ 137,750	\$ 977
Operating expenses	115,086	109,326	5,760
Earnings from operations	23,641	28,424	(4,783)
Financial & other revenues	1,369	1,211	158
Financial & other expenditures	33,374	31,195	2,179
<b>Earnings (loss) for the year</b>	<b>\$ (8,364)</b>	<b>\$ (1,560)</b>	<b>\$ (6,804)</b>

When compared by service, the primary difference from budget was in Water Services, where chemical costs and debt service costs were lower than budget. The difference in Stormwater Services relates to an adjustment to the billed revenue, and the costs allocated from Wastewater Service and debt service costs were lower than budgeted.

The increase in Water Service earnings is a result of lower debt payments.

#### Summarized Operating Results by Service - Comparison to Budget

For the year ended	Budget March 31, 2020 '000	Actual March 31, 2019 '000	\$ Change
Water	\$ (717)	\$ 5,205	\$ (5,922)
Wastewater	(5,073)	(5,035)	(38)
Stormwater	(2,574)	(1,730)	(844)
<b>Earnings (loss) for the year</b>	<b>\$ (8,364)</b>	<b>\$ (1,560)</b>	<b>\$ (6,804)</b>

↑  
**\$2.5M**

#### Water Services Earnings

Total earnings for Water Services were \$5.2M. A \$2.5M increase from last year.

**\$5.0M  
Loss**

#### Wastewater Services Loss

Increased by \$4.5M over last year with higher wage, chemical, material & supply costs.

**\$1.7M**

#### Stormwater Services Loss

Increased by \$0.9M with higher wages and a reduction to site generated charge revenues.

#### Summarized Operating Results by Service - Comparison to Prior Year

For the year ended	Actual March 31, 2020 '000	Actual March 31, 2019 '000	\$ Change
Water	\$ 5,205	\$ 2,759	\$ 2,446
Wastewater	(5,035)	(576)	(4,459)
Stormwater	(1,730)	(795)	(935)
<b>Earnings (loss) for the year</b>	<b>\$ (1,560)</b>	<b>\$ 1,388</b>	<b>\$ (2,948)</b>

**NO  
CHANGE**

#### Water, Wastewater & Stormwater Rates

Rates for services did not change in the fiscal year. The last adjustment to Water and Wastewater charges was in 2016, and 2017 for Stormwater.

## Revenue

Operating revenues decreased from last year by \$0.5M. Consumption decreased by 0.22% on a volumetric basis resulting in a decrease in consumption revenue. Base charge revenue increased as there were 619 new water accounts.

The wastewater rebate, which is available to certain large customers whose wastewater is a lower proportion of their consumed water, decreased \$0.4M from the prior year due to a higher than anticipated rebate in the prior year as consumption fluctuates based on environmental factors.

Operating Revenues				
For the year ended	March 31, 2020 '000	March 31, 2019 '000	\$ Change	% Change
Consumption revenue	<b>\$ 86,054</b>	\$ 86,244	\$ (190)	(0.2%)
Base charge revenue	<b>33,399</b>	33,191	208	0.6%
Wastewater rebate	<b>(1,041)</b>	(1,494)	453	(30.3%)
Metered sales total	<b>118,412</b>	117,941	471	0.4%
Stormwater site generated charge	<b>5,361</b>	5,906	(545)	(9.2%)
Stormwater right of way	<b>3,835</b>	3,835	-	0.0%
Public fire protection	<b>7,074</b>	7,074	-	0.0%
Private fire protection	<b>881</b>	869	12	1.4%
Other operating revenue	<b>2,187</b>	2,577	(390)	(15.1%)
<b>Operating revenue total</b>	<b>\$ 137,750</b>	\$ 138,202	\$ (452)	(0.3%)

Stormwater site generated charge revenue is less than the prior year. The decrease relates to an adjustment to revenue billed.

Other operating revenue categories are down \$0.4M. This is a result of a decrease in septage tipping revenues as customers have been taking their septage outside of HRM for disposal.



# Expenditures

## Operating Expenditures

### Operating Expenditure Total

As summarized in the table below, reported operating expenditures for 2019/20 are \$109.3M, an increase of \$3.8M or 3.60% compared to the prior year.

**\$109.3M**

The main driver of the increase was depreciation expense, which increased \$2.1M over 2018/19. Salaries and benefits contributed to the increase within Regulatory Services, as a result of the

transfer of operations technologists from Water Services. A similar situation occurred between Wastewater and Stormwater Collection, with the wastewater side experiencing an increase related to salaries and benefits. The same wage pool services both Wastewater and Stormwater Collection, so expenditures in any given year could shift between the two based on operational needs. The other significant increase in 2019/20 appeared within Wastewater Treatment Plants, mainly the result of an increase in chemical costs, specifically alum.

Operating Expenditures				
For the year ended	March 31, 2020 '000	March 31, 2019 '000	\$ Change	% Change
Water supply & treatment	\$ 8,245	\$ 8,516	\$ (271)	(3.18%)
Water transmission & distribution	9,867	10,014	(147)	(1.47%)
Wastewater collection	12,354	11,675	679	5.82%
Wastewater treatment facilities	18,714	18,197	516	2.84%
Stormwater collection	4,752	4,901	(149)	(3.04%)
Small systems & other services	3,247	2,842	405	14.25%
Scada, controlling & pumping	2,641	2,388	253	10.59%
Engineering & information services	8,436	8,156	280	3.43%
Regulatory services	3,781	3,152	629	19.96%
Customer service	5,167	4,920	247	5.02%
Administration & pension	7,044	7,756	(712)	(9.18%)
Depreciation	25,078	23,006	2,072	9.01%
<b>Operating expenditures total</b>	<b>\$ 109,326</b>	<b>\$ 105,524</b>	<b>\$ 3,802</b>	<b>3.60%</b>

### Major Cost Reduction in 2019/20

There was a major cost reduction of \$0.8M within Administration and Pension. As a result of the January 1, 2019 actuarial valuation of the pension plan, Halifax Water was no longer required to make special payments to the plan related to the unfunded liability, as the financial position of the plan was in a surplus position.

**\$0.8M**



## Financial & Other Expenditures

Reported financial and other expenditures totalled \$31.2M in 2019/20, a decrease of \$2.0M or 6.01% compared to the prior year. The decrease was directly attributed to debt servicing costs, including long-term debt principal and interest.

Financial & Other Expenditures				
For the year ended	March 31, 2020 '000	March 31, 2019 '000	\$ Change	% Change
Long-term debt interest	\$ 7,144	\$ 7,430	\$ (286)	(3.85%)
Long-term debt principal	18,719	20,516	(1,797)	(8.76%)
Amortization debt discount	187	199	(12)	(6.03%)
Dividend/grant in lieu of taxes	5,078	4,999	79	1.58%
Miscellaneous	67	45	22	48.89%
<b>Financial &amp; other expenditures total</b>	<b>\$ 31,195</b>	<b>\$ 33,189</b>	<b>\$ (1,994)</b>	<b>(6.01%)</b>



## Regulated & Unregulated Activities

Summarized Operating Results by Activity Comparison to Prior Year			
For the year ended	Actual March 31, 2020 '000	Actual March 31, 2019 '000	\$ Change
Regulated activities - earnings (loss)	\$ (2,260)	\$ 22	\$ (2,282)
Unregulated activities - earnings	700	1,366	(666)
<b>Earnings (loss) for the year</b>	<b>\$ (1,560)</b>	<b>\$ 1,388</b>	<b>\$ (2,948)</b>

**\$2.3M  
Loss**

Activities regulated by the NSUARB show a loss of \$2.3M compared to the prior year.

Earnings from unregulated activities decreased by \$0.7M as septicage customers are taking their septicage outside of HRM for disposal.

## Regulatory Activities

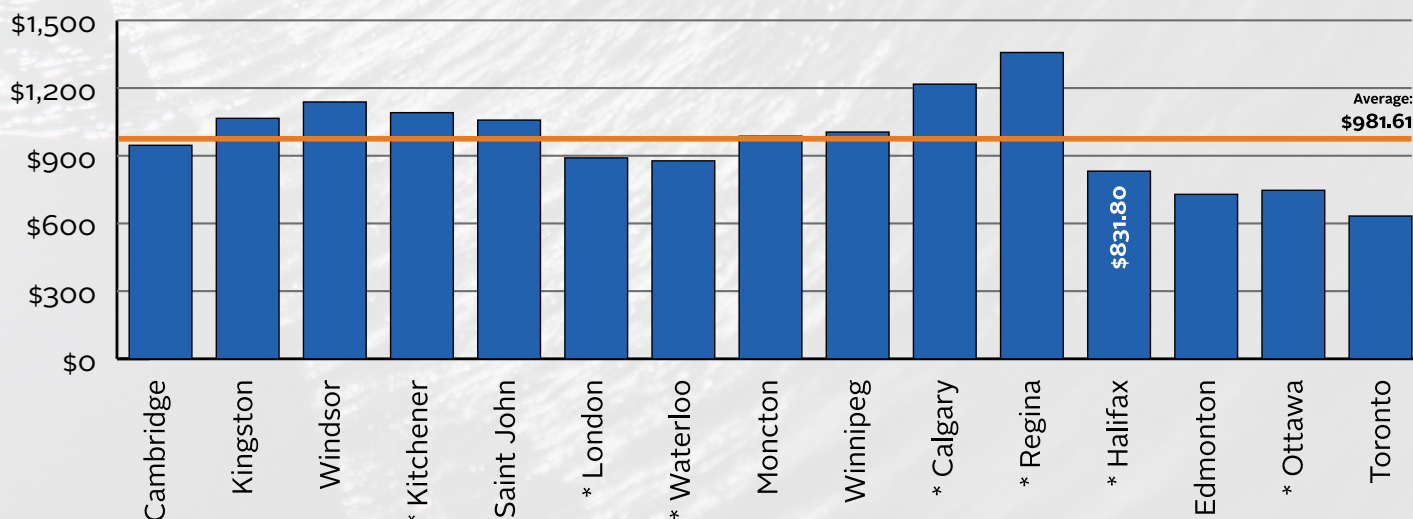
In February 2020, Halifax Water applied to the NSUARB for increases in the rates for Water Services and Wastewater Services. Under the application, the average residential customer would see their annual

Summary of Rates - Water & Wastewater	
Volumetric Charges (per m <sup>3</sup> )	Effective April 1, 2016
Water	<b>\$0.976</b>
Wastewater	<b>\$1.753</b>
Combined	<b>\$2.729</b>
Bases Charges (per year)	
Water	<b>Varies by Meter Size</b>
Wastewater	<b>Varies by Meter Size</b>

Summary of Rates - Stormwater	
Residential - Impervious Area	Effective July 1, 2017
Less than 50 m <sup>2</sup>	-
50 m <sup>2</sup> to 200 m <sup>2</sup>	<b>\$14.00</b>
210 m <sup>2</sup> to 400 m <sup>2</sup>	<b>\$27.00</b>
410 m <sup>2</sup> to 800 m <sup>2</sup>	<b>\$54.00</b>
Greater than 810 m <sup>2</sup>	<b>\$81.00</b>
Culvert only service	<b>\$14.00</b>
Ici rate per m <sup>2</sup>	<b>\$0.135</b>

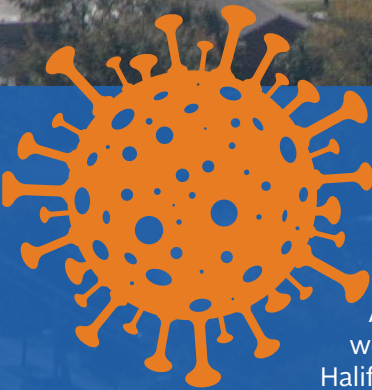
water and wastewater bill increase by approximately 5.80% starting September 1, 2020, and 5.80% effective April 1, 2021. Even with these proposed increases, the average residential customer in Halifax would pay 1.08% of their income for Water, Wastewater and Stormwater Services. A cost that would continue to be below the average in benchmark communities across Canada.

### Annual Average Residential Cost Benchmark Cities



\* Includes Water, Wastewater and Stormwater; all others are Water and Wastewater only.





# Supporting Our Customers During the COVID-19 Pandemic

After the rate application was filed, our customers were impacted by the world-wide COVID-19 pandemic. Halifax Water responded quickly to support customers and implemented measures to assist those that may have difficulty paying their accounts. Effective March 13, 2020, customers were able to defer payments, no interest charged on overdue accounts, fees for dishonoured payments were waived and disconnection for non-payment of service were suspended.

**Editorial Note:** On May 25, 2020, Halifax Water submitted a revised rate application. Halifax Water proposed:

- No increases in water rates for fiscal 2020/21 and 2021/22,
- No increases in wastewater rates until April 1, 2021. A reduction in the requested volumetric rate increase for wastewater on April 1, 2021, from \$2.097 per cubic meter in the application to \$2.073 per cubic meter.
- Deferral of increases to other miscellaneous fees and charges requested in the Application to April 1, 2021.
- To extend the current customer relief mechanisms to August 31, 2020.

In July 2020, the NSUARB approved the extension of the customer relief mechanism to August 31, 2020.

On August 27, 2020, the NSUARB approved Halifax Water’s revised application.

## Cost Containment

Cost containment continues to be a focus for the Utility and is one of the key reasons Halifax Water has been able to maintain rates. A formal cost containment program has been in place since 2013. The result of Halifax Water’s cost containment program in 2019/20 saw savings of \$0.7M in the following categories:

Procurement Strategies	\$0.3M
Human Resource Strategies	\$0.3M
Facilities/Process Strategies	\$0.1M

### Cost Containment Total

Cost containment initiatives from fiscal years 2013/14 to 2019/20 resulted in savings of \$6.9M, as reported to, and accepted by the NSUARB.

\$6.9M



## Pension Plan

All Halifax Water employees are members of one of two pension plans.

Employees that transferred from HRM, of which 57 remain, are members of the HRM Pension Plan. Halifax Water is obligated to make a contribution for these employees' service to the HRM Pension Plan.

For all other employees, Halifax Water maintains a defined benefit pension plan, the Halifax Regional Water Commission Employees' Pension Plan (HW Pension Plan). The HW Pension Plan has undergone significant changes that have improved the financial position of the plan.

**\$8.7M  
SURPLUS**

### HRWC Employees' Pension Plan Surplus

On December 31, 2019, the HW Pension Plan had a surplus of \$8.7M, an increase from \$2.1M on December 31, 2018.

In 2019, the net assets available for benefits increased to \$141.6M from \$126.5M in 2018. The increase was primarily related to an increase in fair value of the investment assets. Over the same period, the pension obligations increased to \$132.8M from \$124.4M at the end of 2018.

The financial statements for the HW Pension Plan are audited by Grant Thornton LLP and can be located at [halifaxwater.ca/publications-reports](http://halifaxwater.ca/publications-reports). The financial statements contain the Independent auditor's report issued by Grant Thornton.

Since December 31, 2019, the outbreak of COVID-19 and related global responses have caused material disruptions to businesses around the world, leading to an economic slowdown. As a result, as of May 31, 2020, the fair value of the HW Pension Plan's investments declined by 2.61% or approximately \$3.7M. It is not anticipated that the decline will impact the plan's ability to continue to make benefit payments.

### HRWC Employees' Pension Plan Abbreviated Financial Position at December 31

	2019 '000	2018 '000	\$ Change
Net assets available for benefits	\$ 141,579	\$ 126,459	\$ 15,120
Pension obligations	132,841	124,371	8,470
<b>Surplus</b>	<b>\$ 8,738</b>	<b>\$ 2,088</b>	<b>\$ 6,650</b>

### HRWC Employees' Pension Plan Abbreviated Changed in Net Assets Available for Benefits at the Year Ended December 31

	2019 '000	2018 '000	\$ Change
Revenue	\$ 14,084	\$ 4,536	\$9,548
Contributions	6,435	6,250	185
Expenses	(5,398)	(4,060)	(1,338)
<b>Increase in net assets available for benefits</b>	<b>\$ 15,121</b>	<b>\$ 6,726</b>	<b>\$ 8,395</b>

Robie Street Reservoir  
Capacity: 15,900,000 litres



# SERVICE EXCELLENCE

## Customer Care Centre

In March 2020, our full-service Customer Care Centre successfully transformed how we manage our customer connections by deploying a state-of-the-art Contact Management Solution. The new solution provides tremendous insight into the number and nature of our customer connections and allows us to forecast call volume more accurately. With this information, we can more effectively staff our Customer Care Centre and meet our newly established Service Level of 65% of calls to be answered within 20 seconds. The new solution provided the opportunity for staff to continue to be effective as Halifax Water transitioned to working from home in response to the COVID-19 pandemic. The transition was seamless with no interruption to our customers, and we were able to keep our employees working safely.

**2019/20 Customer Care Centre Performance**

Total Calls Answered	Average Daily Calls	Abandonment Rate	Average Speed of Answer (Seconds)	% of Calls Answered Within 20 Seconds	Busiest Day of 2019/20	Busiest Month of 2019/20
67,380	347	22%	260	32%	May 21 620 Calls	June 8,839 Calls

The year had its share of performance challenges resulting from continued resource shortfalls combined with higher than normal call volume due to the rollout of the new AMI meters under the Customer Connect Program, and challenges faced by our meter deployment partner. We have turned the corner, and with the implementation of the Contact Management Solution in March, Halifax Water is surpassing the Service Level target of 65% of calls to be answered within 20 seconds. Our current performance is 85% of calls are answered within 20 seconds.

## Halifax Water Helping Customers

In 2019/20, Halifax Water continued to provide programs that benefit customers with low incomes.

H2O (Help to Others) Program – Since 2011, Halifax Water has partnered with the Salvation Army to provide emergency assistance to low-income customers through the H2O Program. The amount of assistance available is a grant of \$275 once in a 24-month period. The income eligibility thresholds are \$21,000 for single income and \$39,000 for family income. Halifax Water continues to improve its communication about the program and the application process.

**\$36,926**

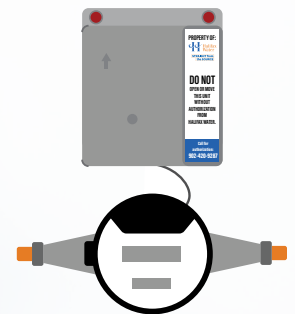
### H2O Fund Grants Provided to Customers

Our communication approach is working, and, for the second year in a row, all available funds in the annual program were utilized. In 2019/20, \$36,926 in grants were provided to 150 customers.

## Advanced Metering Infrastructure (AMI)

The Advanced Metering Infrastructure (AMI) project was initiated in 2016/17 and involved installing meters and a fixed network of radiofrequency devices over the service area to remotely read meters on a much more frequent basis (typically hourly). The technology reduced the need for meter readers to walk or drive a route to read meters with portable radio frequency devices. In addition, AMI promises many features that will improve the level of service Halifax Water can offer in the future to its customers, including:

- The ability to offer monthly billing to residential and small commercial customers, making it easier for customers to manage cash flow and automated payments.
- The increase in customer consumption data will be used to proactively provide improved and more timely notification to customers on high consumption due to things like plumbing leaks.
- Halifax Water is also developing a Customer Portal that will allow customers to manage their water accounts and consumption and to see the effect of any conservation measures they take.



AMI has been providing much more data about the water being consumed by customers and the operations of the distribution system. The combination of customer and distribution data will allow Halifax Water to identify issues within the distribution system, including leaks. The ability to use this data will result in reduced costs for billing and collection and reduce the need for the high-cost activity of sending technicians to customer homes.

The AMI project was officially completed in 2020. Commercial meters greater than 3" are proactively being converted to AMI by Halifax Water's metering staff and should be completed by March 31, 2021.

**82,878  
INSTALLED**

### AMI Project Completed Installations

82,878 meters, or 97% of the total, were converted to AMI. The remaining 2,650 meters, or 3%, are being converted to AMI as part of the regular maintenance program.

## Customer Portal

Halifax Water has an aggressive timeline to launch our highly anticipated Customer Portal in Fall 2020! This will modernize how Halifax Water provides information to our customers, including billing information, potential high consumption alerts. It will also allow customers to maintain and update their account information, submit requests, and monitor usage in real-time. In Spring 2021, the Customer Portal will allow customers to use webchat to communicate with staff, an additional option for customers to communicate with Halifax Water.



# EFFECTIVE ASSET MANAGEMENT

## Capital Infrastructure Projects

### Integrated Water, Wastewater & Stormwater Projects with HRM Street Program

#### Integrated Infrastructure Upgrades

Halifax Water invested approximately \$8.25M to upgrade infrastructure systems within this program in 2019/20.

**\$8.25M**

Halifax Water proactively replaces and rehabilitates water, wastewater and stormwater infrastructure in conjunction with municipal street reconstruction projects. Working with HRM to complete this work in conjunction with paving/street renewals reduces project costs.

### Water & Wastewater Main Replacements & Linings in 2019/20



**Water Mains Replaced: 3.653 KM**



**Wastewater Mains Lined (CIPP): 5.797 KM**



**Wastewater Mains Replaced: 1.750 KM**





## Pumping Station Control Panel Electrical Replacement

Control panels at eleven pumping stations were upgraded in 2019. Components were near the end of their service life (monuments, electrical conduits and boxes, communication equipment, etc.).

**\$1.05M**

### Project Cost & Funding Source

This project was funded by Halifax Water Rates.



## Ellenvale Run Stormwater Channel Upgrades

The Ellenvale Run conveys the stormwater from Lemont Lake to Morris Lake. The overall project focuses on the portion of Ellenvale Run between Main Street and Portland Street, which has been significantly urbanized and now, almost entirely (90%), consists of a constructed channel instead of a natural stream.

The retaining walls along the channel consist of various materials and types; gabion basket, masonry stone walls, steel sheet piles, and precast concrete blocks. The condition of the retaining walls also varies with some walls in relatively good condition while others are failing, and temporary bracing has been installed. This project includes energy dissipation pools, natural pool and riffle sequencing, and natural stone on the bottom of the channel liner to stabilize the channel walls, 'naturalize' the channel, and reestablish or improve the natural habitat. These improvements provide a naturalized stream bottom that reduces velocities, creates pools and meanders, and helps to improve fish passage.

The past year saw three additional sections of the Ellenvale Run rehabilitated near John Cross Drive, Elwin Crescent and Wanda Lane. Each section was entirely replaced with concrete channel liners complete with textured faces and naturalized bottoms. Construction was challenging due to the close proximity of the adjacent private properties. Our contractor, consultant, and staff had to work collaboratively with the property owners to complete the project, and ensure that reinstatement was satisfactory. Detailed design continues on the remaining sections requiring rehabilitation, and we anticipate two further sections will be replaced next year.

**\$6.0M**

### Project Cost & Funding Source

This project was funded by Halifax Water Rates.





## Capital Infrastructure Projects

### Lake Major Dam Replacement Project

Construction of the Lake Major Dam was completed in 2019. The new concrete structure replaced a timber crib/rock dam that dated back to the 1940s. The new dam will also help maintain and protect the water supply to the Lake Major Water Supply Plant, which in turn provides drinking water to Dartmouth, Cole Harbour, Eastern Passage, North Preston, Westphal and Burnside.



#### Resilience

The new dam offers better control of lake levels.



#### Fish Passage

A fish ladder allows fish to go upstream into Lake Major.



#### Reliability

The expected lifespan of the new dam is 50+ years.

### Project Cost & Funding

#### Cost:

\$5.7M  
\$3.4M

#### Funding Sources:

Halifax Water Rates  
Clean Water & Wastewater Fund

Fish Ladder

Sluice Gates

New Lake Major Dam

### J. D. Kline Water Supply Plant Filtration System Replacement

This was a multi-year project to remove and replace the underdrains and filter media in all eight filter galleries of the J. D. Kline Water Supply Plant. The work included concrete rehabilitation, wiring and control upgrades and the construction of a new air scouring system.

**\$10.3M**

#### Project Cost & Funding Source

This project was funded by Halifax Water Rates.

### Miller Lake Water Main Extension

Following the Fall River Water Main Extension that brought water service to Highway #2, and other parts of Fall River, a further extension of that system was installed from Highway #2 up Miller Lake Road to the existing Miller Lake Small System. This work allowed for the small well-supplied system in the area to be decommissioned and for the customers to be supplied directly from the Pockwock Supply system.

#### Project Cost & Funding Source

This project was funded by Halifax Water Rates.

**\$787,000**

New Valve and Water Main  
Connecting the Two Systems



## Lucasville Road Transmission Main Extension - Phase 1

The first phase of the Lucasville Transmission Main was completed in 2019. This project is part of a long term plan to upgrade the transmission capacity to the Sackville service area, improving the resilience of the water supply to this region.



600 mm Diameter Transmission Main Being Installed

**\$6.4M**

### Project Details, Cost & Funding Source

This work involved the installation of 3700 metres of 600 mm diameter transmission main along the Lucasville Road. This project was funded by Halifax Water Rates.

## Caldwell Road Air Release Valve Chamber

This work consisted of installing a new section of DR18 pipe on the existing 450 mm asbestos cement pressure sewer on Caldwell Road. Project included a new 1800 mm chamber and associated fittings. This work was completed by the Halifax Water East Operations Team.

New 1800 mm Chamber Installed



### Project Cost & Funding Source

This project was funded by Halifax Water Rates.

**\$59,000**



Wastewater Forcemain Installation

## Beaver Crescent Pumping Station Forcemain

The East Region Wastewater Operations Team installed approximately 650 metres of 150 mm diameter DR18 PVC wastewater forcemain pipe on Atholea Drive, between Caldwell Road and Beaver Crescent.

**\$463,339**

### Project Cost & Funding Source

This project was funded by Halifax Water Rates.



## New Burnside Operations Centre Update

Aligning with our capital plan, over the last year Halifax Water explored alternate lots within the Burnside Business Park for our new consolidated Burnside Operations Centre. Lots were reviewed to ensure the lot selected was appropriately sized and shaped, had access to major traffic corridors, provided site development opportunities, offered curb appeal with privacy and was available for purchase. In April 2020, a 14.09 Acres lot on Jennett Avenue in the Burnside Business Park was purchased.

From a customer perspective, the new facility will:

- Maintain current high levels of customer service while improving facilities for the employees.
- Position the utility well for future areas of growth – the Dartmouth to Bedford corridor along the Magazine Hill, and the Dartmouth to Fall River corridor

From a corporate perspective, the new facility will:

- Reduce life cycle costs compared to owning and operating the four (4) existing facilities or two new regional facilities
- Provide building operational cost-savings
- Offer economies of shared storage spaces, equipment and materials
- Provide for the ease of managing fewer facilities
- Create enhanced opportunities for Interdepartmental, integrated collaboration

## Shipyards Road Wastewater Pump Station

The Shipyards Road pump station, just off of Shore Drive in Bedford, collects wastewater from approximately 30 properties along the shore of the Bedford Basin. The Lions Club pump station, which was approximately 120 meters away from the Shipyards Road pump station, discharged into the Shipyards Road pumping station. Both stations were constructed in the mid 1970s and had reached the end of their useful life.

As both of these stations were in need of replacement (and because of their proximity to one another), it was an excellent opportunity to install a slightly deeper wetwell at the Shipyards Road pump station, convey flows from the Lions Club station to the Shipyards station by the installation of a gravity sewer, and remove the Lions Club pump station. This work was conducted in the Spring of 2019. Halifax Water now has one less pump station in its inventory, resulting in reduced operational and maintenance costs and fewer headaches for staff.

Replacement of the Shipyards Road pump station was achieved using pre-fabricated components (wetwell, valve chamber & control panels). This unique approach resulted in a reduced construction schedule, thus fewer impacts on adjacent properties and no impact on the Lions Club Pool, which was able to open on schedule.

**Project Cost & Funding Source**  
This project was funded by  
Halifax Water Rates.

**\$1.2M**

Shipyards Road  
Wastewater  
Pump Station  
Wetwell Installation



## Halifax Peninsula Sewer Separation

The sewer separation program within the peninsula of Halifax is an outcome of the West Region Wastewater Infrastructure Plan (WRWIP) and the HRM Regional Centre Local Wastewater Servicing Capacity Analysis (LoWSCA). The program was identified in the WRWIP and carried forward in the Halifax Water Infrastructure Master Plan (IMP). Generally defined, sewer separation is the establishment of distinct wastewater and stormwater sewers in replacement of a single combined sewer. Sewer separation removes or reduces stormwater flow in the wastewater system. The treatment requirements of wastewater (including combined sewage) result in a higher capital cost to construct and higher costs to operate when compared to the stormwater system. It was determined that the Young Street, Kempt Road, and Spring Garden Road areas provide the greatest opportunities for sewer separation within the Halifax Peninsula.



Construction on the first two projects in the Kempt Road area began in the spring of 2020 and are expected to be complete by November. This includes the installation of a new stormwater pipe on Romans and Federal Avenue, as well as the replacement of the water main. A new, separate storm pipe is being installed on Bayers Road as part of an integrated project with HRM.

Construction is also expected to begin in Fall 2020 on the first project in the Spring Garden Road area. New stormwater pipe will be installed on South Park Street and Cathedral Lane with construction finishing in Spring 2021 on University Avenue. Detailed design continues in all project areas with further construction expected in the Spring Garden Road area and Young Street area next year.

## Engineering Information

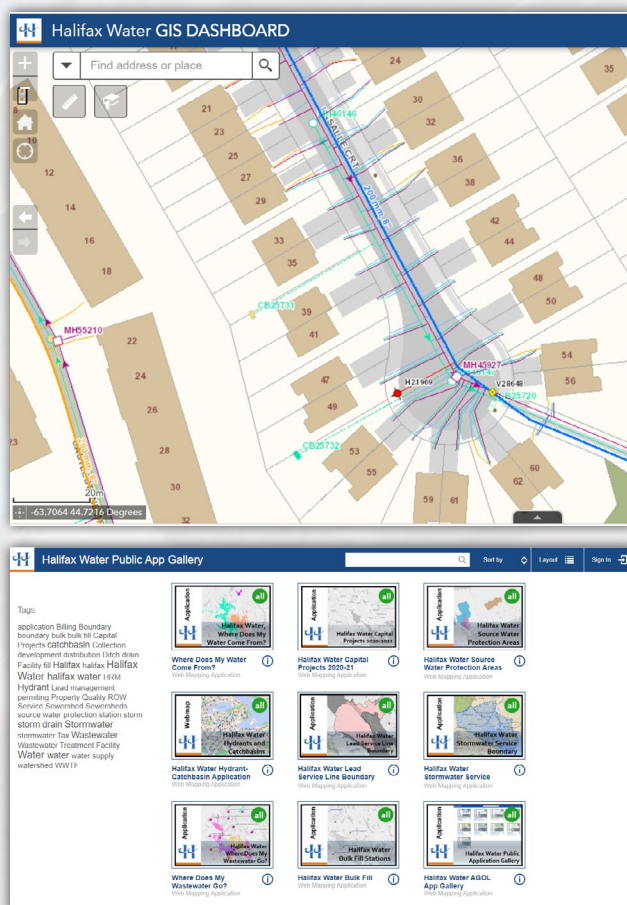
The Engineering Information section continues to provide administration, maintenance and on-going development of the corporate Geographic Information System (GIS) and related applications. These applications include core desktop GIS, as well as Cityworks and FORMS applications. Also, a number of purpose-built Web GIS apps are now available to meet specific business needs. This year also saw continued gains in data gap improvements, especially as it relates to the conversion of our historical hard copy service records, which are being entered into our GIS database.

### GIS/Cityworks Upgrade & New GIS Dashboard

Our most significant project this past year included an upgrade to our GIS and Cityworks environments as well as the launch of a new Web GIS application, GIS Dashboard. This application has become the go-to app for most staff who need to access Halifax Water infrastructure information.

### Web GIS Growth

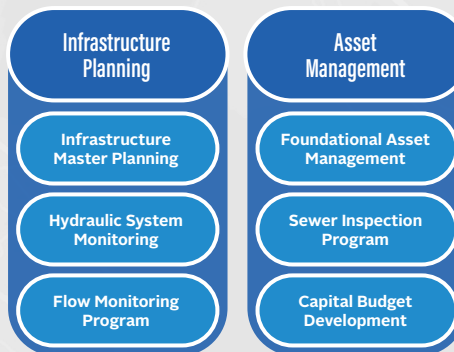
Web GIS applications continued to grow within the organization both for internal business unit use and also for public access. The public access of these apps is via a Public App Gallery contained on the Halifax Water website.





## Asset Management

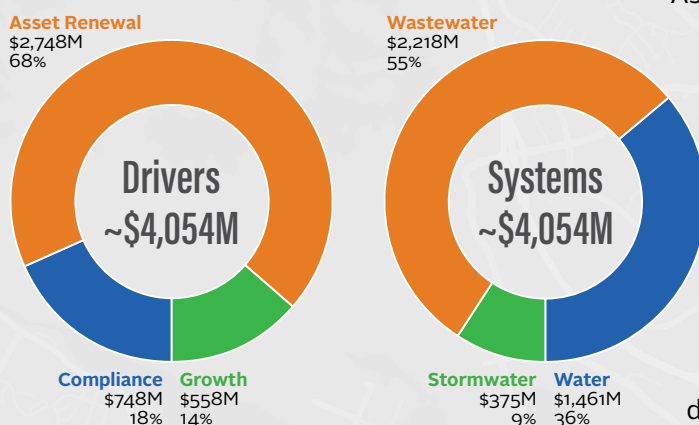
The Asset Management (AM) Team is responsible for long-term infrastructure planning and the corporate asset management program. Key achievements in 2019/20 included completion of the Infrastructure Master Plan and the Integrated Resource Plan (IRP) Update; preparatory work to build an extended period simulation (EPS) hydraulic water model; updating the Asset Management Plan (AMP) for fiscal 2019; and completing year four of both the corporate flow monitoring program and the sewer inspection program. The AM Team also leads the preparation of the annual and five-year capital budgets.



## Integrated Resource Plan Update

The Integrated Resource Plan (IRP) is a key component of Halifax Water's planning process. The process was initiated in 2012 with the first IRP and continued with further understanding of the infrastructure systems and development of studies and frameworks, capital delivery and financial planning.

The 2019 IRP Update is built on the foundation of the 2012 IRP and helps define Halifax Water's required programs and resources for a 30-year period covering each of the three drivers: Growth, Asset Renewal, and Regulatory Compliance.



The 2019 IRP presents an infrastructure plan with a projected expenditure of approximately 4 billion dollars over the next 30 years. The 2019 report was a background document in the 2020 general rate application.

## Long-Term Planning Framework

The Long-Term Planning Framework (LTPF) defines the direction of long-term water, wastewater and stormwater infrastructure planning activities. Halifax Water took the opportunity to update the LTPF to incorporate lessons learned from the IRP Update and supporting studies.

The framework considers all drivers of infrastructure management, including growth, asset renewal, and regulatory compliance.



## 2019/20 Asset Management Plans

With official sign-off of the 2019/20 AMP, the AM Team continued working with Asset Management Implementation Teams (AMITs), focusing initially on Water Transmission Mains, Wastewater Forcemains, and Stormwater Cross Culverts.

## Corporate Flow Monitoring Program

Year four of the corporate flow monitoring program resulted in a total of 115 active flow monitoring sites within Halifax Water's wastewater, combined, and stormwater systems and 11 rain gauge locations. Of the 115 sites, 85 represent sites essential for ongoing calibration of Halifax Water's wastewater model and are referred to as Flow Monitoring Zones (FMZs). The other 30 sites are priority sewersheds identified as part of Halifax Water's Wet Weather Management Program (WWMP). In addition to the active corporate flow monitor sites, there were multiple flow monitors installed for a short period to support various capital projects.

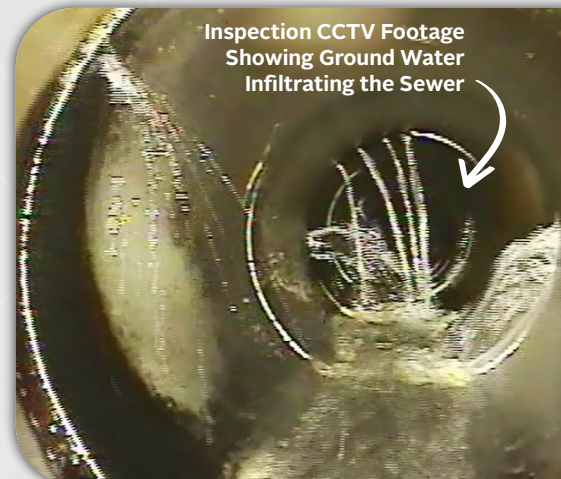
## Sewer Inspection Program

Staff have worked to integrate the inspection software with Halifax Water's GIS to optimize the process for uploading data into the corporate GIS using ESRI's CCTV Manager. CCTV Manager will simplify updating of pipe material, size, and condition with information collected directly from the inspections.

**54,695  
METRES**

Year four of the sewer inspection program was productive: 54,695 metres of sewers, and 1,873 structures (1,493 manholes and 380 catchbasins) were inspected in 2019/20.

In 2019/20, the sewer inspection program focused mainly on HRM-HW integrated projects in Lower Sackville, Cole Harbour, Eastern Passage, North Preston and Bridgeview, Halifax.





## Energy Management

Energy use in municipal water and wastewater/stormwater treatment facilities and their respective distribution and collection systems remains among the highest in North America. With this in mind, Halifax Water has continued its efforts to improve its energy footprint.



2019/20 Energy Savings of

2,722,000 kWh



2019/20 Cost Savings of

\$286,000



2019/20 Greenhouse Gas Emissions Reduction of

1700+ Tonnes

- The Energy Management Plan was updated to identify specific annual energy reduction targets and activities to be completed in 2019/20.
- Various equipment and infrastructure upgrades were completed, as well as several ongoing annual operating initiatives.
- Additions to the Energy Management Information System this year include monitoring water consumption for all Halifax Water facilities, water and wastewater treatment flow data for larger facilities, and applicable greenhouse gas (GHG) tracking for facilities and fleet.
- The early-stage development of the Cogswell District Energy System (DES) continued this year. Further development of a DES by-law has been completed, along with the ongoing updating of the business case. Next steps include preparation for stakeholder engagement, ongoing updates to the business case, completion of the detailed design for the DES infrastructure Halifax Water will be responsible for, the development of the required building specifications and overall utility development efforts.
- We continue to consider energy efficiency and sustainability at the design stage of infrastructure projects. Current projects include the new Burnside Operations Centre, the upcoming Mill Cove WWTF upgrade, and the Aerotech Biosolids Processing Facility upgrade.
- When appropriate, Halifax Water has also taken advantage of provincial energy efficiency rebate programs offered by Efficiency Nova Scotia, which help to reduce capital costs and improve project payback.

2019/20 saw an overall utility annual energy reduction of 2.1%, an aggregate decrease in water and wastewater flows of 0.4%, and an aggregate decrease in GHG emissions of 10.6%. Direct GHG emissions (i.e. fossil fuels used for heating) were 1,754 tonnes CO<sub>2</sub>e, while indirect emissions (i.e. emissions from electricity use via NSPI) were 34,599 tonnes CO<sub>2</sub>e.







## Information Technology Five-Year Strategic Plan

Halifax Water continues to execute its IT Strategic Plan to improve organizational efficiency, effectiveness and customer service through technology and organizational change.

Six strategic themes characterize the plan:

- **Customer Experience**
- **Information Integration with Location**
- **Analytics-Driven Decision Making**
- **Managed Knowledge and Workflow**
- **Enable Employees Anywhere**
- **Secure IT Foundation**

The IT Strategy Five-Year Roadmap 2021/22 is a high-level snapshot of the sequence of programs to deliver on the approved technology vision and recommended architecture.

**\$6.75M**

The plan has a project value of \$6.75M in 20/21 and a total of over \$28M for the balance of the plan.

### Completed Projects

- Advanced Metering Infrastructure
- Asset Register
- Customer-facing website
- Desktop Replacement Program
- Document management guidelines
- GIS and Cityworks Upgrade
- GIS Dashboard Replacement
- Internal website (Intranet)
- Telephony
- WI-FI Infrastructure in Pockwock

### Projects Coming Up in 2021-2022

- Analytics and Dashboard Linkage
- Approval Forms Framework
- Asset Condition
- Enterprise SharePoint rollout for Document Management
- General Analytic Tools
- Electronic Content Management Linkage
- Team Collaboration

### Projects Underway

- Analytics Decision Support System Phase One and Phase Two
- Capital Planning
- Computerized Maintenance Management System Enhancements
- Customer Portal
- Disaster Recovery Planning
- Document management pilot
- Enterprise Resource Planning Solution
- Full Enterprise Data Warehouse
- Impervious Surface Updates
- IT Help Desk software replacement
- IT Security assessment and roadmap
- IT Server Hosting
- Mobile Device Management software installation
- New Payroll System
- Office 365 migration
- Permit Approvals
- Quality Data Management and Reporting

Cogswell District  
90% Construction  
Design Plan



# REGULATORY COMPLIANCE

P2 Staff Investigating  
Pollution in a River

## Environmental Management System

An Environmental Management System (EMS) is a system of procedures, records and processes to manage environmental issues and assist with regulatory compliance. It also makes day to day operations more sustainable and engages employees in these operational activities. The EMS program can be audited against ISO 14001 standards, and if found to comply, receives certification through ISO.

Staff have successfully obtained certification for the J. D. Kline, Lake Major and Benney Water Supply Plants and the Herring Cove and Dartmouth Wastewater Treatment Facilities. Preliminary work has been completed to prepare Halifax, Eastern Passage, Mill Cove and Aerotech Wastewater Treatment Facilities for future audits. In addition, a project to develop the framework to implement an EMS system corporately has commenced.







## Engineering Approvals

The Engineering Approvals group is focused on adherence to the Halifax Water Design Specifications, the Supplementary Standard Specification and the Schedule of Rates, Rules and Regulations with respect to connections to, and expansions of the Halifax Water Systems. The administration of the new service connections includes the inspection of the new services and renewals and the administration of Regional Development Charge.

In 2019/20, the Engineering Approvals group processed:

Results by Activity		
Application Type	2019/20	2018/19
Building Permit Applications	1,338	747
New Service & Renewal Applications	443	408
Subdivision Applications	273	198
Metres of New Water Main	2,205	9,328
Metres of New Wastewater Main	2,191	1,865
Metres of New Stormwater Main	2,509	4,854
Demolition Permits	118	113
Clearance Letters	40	23
Tender Reviews	83	100
New Backflow Prevention Applications	112	140
Backflow Prevention Devices Are Active	7,182	7,050

## Regional Development Charge

The Regional Development Charge (RDC), approved in 2014, is collected from new development or redevelopments to fund growth's share of regional water and wastewater infrastructure. In developing the RDC, staff reviewed the projected population growth and identified the upgrades, and associated costs, to regional wastewater and water infrastructure to accommodate growth over the next 20 years.

With the completion of the Infrastructure Master Plans, staff were able to commence the detailed five-year update to the RDC. The update considered current population projections, household sizes, design flows for both water and wastewater, the formalized benefit to existing and costing frameworks and detailed 20-year financial model. The proposed RDC considered capacity growth gained from inflow and infiltration reduction projects and reduced the amount of "big pipe" solutions. As part of the process, Halifax Water hosted stakeholder engagement in the summer and fall of 2019.

The proposed updated charge was submitted to the NSUARB in November 2019. The RDC hearing was initially scheduled for March 2020, but was rescheduled to June 2020 and held virtually.



## Environmental Engineering

The Environmental Engineering group oversees the Pollution Prevention (P2) Program, the Inflow/Infiltration (I&I) Reduction Program, and Regulatory Compliance. The purpose of the P2 and I&I programs is to regulate the quantity and quality of discharge from customer connections to the wastewater and stormwater systems. Non-compliant discharges can impact the health and safety of Halifax Water workers, the public, and the environment, and create operational and compliance issues with Halifax Water infrastructure and treatment plants.



Landscaping Work Allowing Soil into the Stormwater System

The P2 program began developing a new 'pretreatment requirements' manual that customers will be able to reference when designing, selecting and installing pretreatment systems for food and vehicle service establishments, sediment interception and others. With the goal of having new installations compliant from the outset, thus saving customers from having to retrofit or modify improper installations.

P2 is responsible for regulating situations where a private wastewater system is inadvertently connected to a stormwater system. Two wastewater to stormwater cross connections were resolved over the past year. Staff also investigate the origin of spills or non-compliant discharges into wastewater and stormwater systems.



Smoke Test Showing an Illegal Downspout Connection to the Wastewater System

The I&I Reduction program identifies and resolves private property connections where stormwater is entering the wastewater system. Staff have completed a number of private side assessments on a priority basis across the Halifax Municipality and works closely with the Wet Weather Management Program to reduce the amount of stormwater entering the wastewater system.

The I&I team also works with the Halifax Water engineering department to coordinate infrastructure upgrade projects and achieve private property I&I compliance during the project's planning, communication and construction activities. This past year, the addition of a stormwater main on Wanda Lane provided better street drainage as well as a stormwater discharge location for private properties.



**14,888 Metres of Wastewater Mains Smoke Tested**



**985 Private Wastewater Laterals Smoke Tested**



**66 Properties Inspected for Regulatory Compliance**



**35 Locations Flow Metered Throughout HRM**



## Water Quality

Providing our customers with safe, reliable, affordable, high-quality drinking water requires investment in infrastructure, research, and robust quality assurance/quality control programs. Halifax Water has made considerable investments in all of these areas.

To ensure that quality control is optimized, we maintain ISO 14001 Environmental Management System Registration at the J. D. Kline (Halifax), Lake Major (Dartmouth), and Bennery Lake (Halifax Airport) Water Supply plants.

Halifax Water undertakes a comprehensive water testing program. Bacteriological testing is done weekly at 51 locations within the urban core, and at each of the small systems.

Additional testing of drinking water includes:

- Chlorine residual, pH, and turbidity of treated water leaving each plant as well as multiple locations within the plant, to monitor and optimize the treatment process.
- Quarterly sampling of treated water at 2-3 locations within the distribution system for approximately 40 chemical parameters.
- Quarterly sampling of raw lake water and water from contributing streams for approximately 40 chemical parameters.
- Bi-annual sampling of Lake Major and Pockwock Lake raw and treated water for all parameters in the Guidelines for Canadian Drinking Water Quality (Health Canada).
- Bi-annual testing and sampling for giardia and cryptosporidium for treated and raw water for all surface water systems.

Water test results are reported to Nova Scotia Environment and the Nova Scotia Medical Officer of Health on a regular basis. Protocols have been established between Halifax Water, and the provincial Health and Environment departments to clearly delineate roles and responsibilities in advance, in the unlikely event of a disruption in water quality.

### Drinking Water Compliance Summary: Total Coliform Results April 2019 - March 2020

System	Number of Samples	Number of Exceedances	% Absent
Pockwock	847	1	99.88%
Pockwock Central	545	0	100%
Lake Major	1210	0	100%
Bennery	156	0	100%
Five Islands	104	0	100%
Silver Sands	106	0	100%
Middle Musquodoboit	103	0	100%
Collins Park	106	0	100%
Miller Lake	67	0	100%
Bomont	105	0	100%
Total	3349	1	99.97%
Absent (A)	3348		99.97%
Present (P)		1	0.03%

99.9%

Approximately 3,350 tests for total coliform bacteria are conducted each year. Results of 99.9% of samples with bacteria absent are consistently achieved.

A Manhole  
Surcharging  
(Overflowing)



# Wastewater Treatment Facility Compliance

Nova Scotia Environment regulates wastewater treatment facilities in Nova Scotia. They set effluent discharge limits for all wastewater facilities. The limits define maximum concentrations of parameters such as CBOD, TSS, and Fecal Coliform. For some facilities, parameters such as nutrients (nitrogen and phosphorus, which cause excess growth of algae and plants) or pH are also regulated.

Halifax Water oversees five large harbour facilities and nine smaller, community-based facilities.

Halifax Water continues to complete several optimization projects that involve the reduction of wet weather influences, equipment upgrades and process enhancements, which have resulted in improved compliance results.

Compliance for the harbour facilities is measured on monthly averages. There has been a significant improvement with the compliance at the five harbour facilities with Herring Cove and Eastern Passage fully compliant for the year.

## Definitions:

**CBOD<sub>5</sub>**: Carbonaceous Biochemical Oxygen Demand – a measure of the amount of organic material.

**TSS**: Total Suspended Solids – a measure of the number of particles in the wastewater.

**E. Coli**: Bacteria which are present in the treated sewage.

**pH**: A measure of the acidity of water.

**N/A**: Not Applicable

## Wastewater Treatment Facility Compliance Summary April 2019 - March 2020

WWTF	April 2019					May 2019					June 2019				
	CBOD <sub>5</sub>	TSS	E.Coli	pH	Toxicity Pass	CBOD <sub>5</sub>	TSS	E.Coli	pH	Toxicity Pass	CBOD <sub>5</sub>	TSS	E.Coli	pH	Toxicity Pass
Halifax	24	21	N/A	7	YES	31	27	2034	7	YES	29	27	747	7	YES
Herring Cove	13	13	N/A	7	N/A	16	18	28	7	YES	15	14	174	7	N/A
Dartmouth	23	73	N/A	7	YES	34	40	514	7	YES	28	40	818	7	YES
Eastern Passage	7	11	N/A	7	N/A	7	4	10	7	YES	8	6	10	7	N/A
Mill Cove	8	16	16	7	N/A	11	16	10	7	YES	10	11	12	7	N/A
July 2019					August 2019					September 2019					
Halifax	46	22	1321	7	YES	61	29	9010	7	YES	51	19	6431	7	YES
Herring Cove	40	15	21	7	N/A	39	16	25	7	YES	35	14	28	7	N/A
Dartmouth	60	45	1214	7	YES	91	49	18391	7	NO	70	42	10794	7	YES
Eastern Passage	27	15	27	7	N/A	29	9	29	7	YES	15	12	15	7	N/A
Mill Cove	14	14	14	7	N/A	24	27	22	7	YES	22	26	12	6	N/A
October 2019					November 2019					December 2019					
Halifax	51	13	3587	7	YES	29	14	N/A	7	YES	25	20	223	7	YES
Herring Cove	26	14	153	7	N/A	21	11	N/A	7	YES	18	13	93	7	N/A
Dartmouth	65	41	3259	7	YES	45	59	N/A	7	YES	39	41	785	7	YES
Eastern Passage	6	7	19	7	N/A	9	11	N/A	7	YES	8	9	22	7	N/A
Mill Cove	31	26	20	6	N/A	16	19	12	7	YES	8	12	16	7	N/A
January 2020					February 2020					March 2020					
Halifax	33	17	N/A	7	YES	54	52	N/A	7	YES	32	18	N/A	7	YES
Herring Cove	27	22	N/A	7	N/A	26	23	N/A	7	YES	30	22	N/A	7	N/A
Dartmouth	51	41	N/A	7	YES	52	34	N/A	7	YES	48	47	N/A	7	YES
Eastern Passage	8	3	N/A	7	N/A	8	7	N/A	7	YES	5	6	N/A	7	N/A
Mill Cove	11	17	10	7	N/A	20	23	12	6	YES	12	16	10	7	N/A

N/A due to seasonal disinfection and toxicity requirements

Specific parameter limit achieved

Specific parameter limit not achieved



Performance assessments for the nine smaller wastewater treatment facilities are based upon quarterly averages. Results for April 2019 to March 2020 are presented below:

Wastewater Treatment Facility Compliance Summary April 2019 - March 2020										
WWTF	Q1 - April 2019 to June 2019									
	CBOD <sub>5</sub>	TSS	E.Coli	Phosphorus	Ammonia	pH	Dissolved Oxygen	Total Chlorine	Toxicity	
Aerotech	9	1	10	0.1	4.6	7.4	8.1	N/A	YES	
Frame *	5	1	10	N/A	N/A	6.8	N/A	N/A	N/A	
Lakeside - Timberlea	7	20	16	2	3	6.9	N/A	0.1	YES	
Lockview - MacPherson *	8	3	16	0.1	5	6.7	N/A	N/A	N/A	
Middle Musquodoboit *	10	13	56	N/A	N/A	7.6	N/A	N/A	N/A	
North Preston	5	9	10	0.2	0.5	6.7	N/A	N/A	N/A	
Springfield	5	7	13	N/A	N/A	6.7	N/A	N/A	N/A	
Steeves (Wellington) *	10	1	10	0.1	0.1	7.2	N/A	N/A	N/A	
Uplands Park *	8	11	34	N/A	N/A	6.7	N/A	N/A	N/A	
	Q2 - July 2019 to September 2019									
Aerotech	3	1	10	0.1	0.1	7.5	7.5	N/A	YES	
Frame *	4	1	10	N/A	N/A	6.6	N/A	N/A	N/A	
Lakeside - Timberlea	6	18	10	1	2	7.0	N/A	0.1	YES	
Lockview - MacPherson *	6	7	25	0.7	3	6.9	N/A	N/A	N/A	
Middle Musquodoboit *	6	9	13	N/A	N/A	7.3	N/A	N/A	N/A	
North Preston	6	4	10	0.2	0.2	6.9	N/A	N/A	N/A	
Springfield	6	4	16	N/A	N/A	7.2	N/A	N/A	N/A	
Steeves (Wellington) *	4	1	10	0.1	0.1	7.6	N/A	N/A	N/A	
Uplands Park *	7	9	10	N/A	N/A	6.6	N/A	N/A	N/A	
	Q3 - October 2019 to December 2019									
Aerotech	4	1	10	0.09	8.1	7.3	8.2	N/A	YES	
Frame *	4	1	10	N/A	N/A	6.9	N/A	N/A	N/A	
Lakeside - Timberlea	9	22	19	1	5	7.2	N/A	0.1	YES	
Lockview - MacPherson *	9	8	10	0.3	1	7.0	N/A	N/A	N/A	
Middle Musquodoboit *	4	7	22	N/A	N/A	7.5	N/A	N/A	N/A	
North Preston	4	13	10	0.4	0.2	6.8	N/A	N/A	N/A	
Springfield	4	4	14	N/A	N/A	6.9	N/A	N/A	N/A	
Steeves (Wellington) *	10	1	10	0.1	0.2	7.0	N/A	N/A	N/A	
Uplands Park *	5	9	17	N/A	N/A	6.5	N/A	N/A	N/A	
	Q4 - January 2020 to March 2020									
Aerotech	2	1	10	0.1	2.4	7.4	9.2	N/A	YES	
Frame *	4	2	10	N/A	N/A	6.2	N/A	N/A	N/A	
Lakeside - Timberlea	6	18	16	1	4	6.9	N/A	0.1	YES	
Lockview - MacPherson *	5	13	10	0.3	1	6.8	N/A	N/A	N/A	
Middle Musquodoboit *	6	4	81	N/A	N/A	7.2	N/A	N/A	N/A	
North Preston	5	8	10	0.2	0.5	6.8	N/A	N/A	N/A	
Springfield	27	50	1696	N/A	N/A	7.3	N/A	N/A	N/A	
Steeves (Wellington) *	5	25	10	0.5	0.1	7.0	N/A	N/A	N/A	
Uplands Park *	7	5	13	N/A	N/A	7.0	N/A	N/A	N/A	

\* WWTF Fully Compliant for Entire Year

	Specific parameter limit achieved
	Specific parameter limit not achieved





Installing a Liner for a CIPP  
Wastewater Main Lining





# STEWARDSHIP OF THE ENVIRONMENT





## Wet Weather Management Program

Like many municipalities and utilities across North America, sections of Halifax Water's sanitary sewer system are subject to dramatic flow increases in response to precipitation events. Wet weather flows in the form of inflow and infiltration (I/I) can lead to sanitary sewer overflows, capacity reduction, sewer backups/basement flooding, treatment process upsets and increased operation and maintenance costs.

To address this issue, Halifax Water has developed a proactive approach to address the negative impacts of wet weather events on the sanitary sewer system. Since its inception in 2013, the goal of Halifax Water's Wet Weather Management Program (WWMP) has been to develop a long-term strategy to cost-effectively address wet weather generated flows. The first phase was a comprehensive pilot program to study the effectiveness and cost of various rehabilitation activities in six sewersheds. An additional pilot studied the effectiveness of "private-only" interventions. The second phase of the program was to deliver a full scale I/I rehabilitation project (Fairview/Old Clayton Park/Bridgeview Sewersheds).

The table below summarizes the rehabilitation activities in the pilot areas as well as full-scale project areas. The results shown are cumulative to date.

WWMP Pilot Project Summary								
Sewershed	Rehabilitation Activity					Private Side Inspections	Peak Flow Reduction (L/sec)	Peak Flow RDII Reduction (%)
	Mainline Lining	Lateral Lining	Manhole Lining	Deep Storm	Public-Side Repairs			
Fairview/Old Clayton Park/Bridgeview (Phase 1)	✓						166	65%
Stuart Harris Drive	✓	✓				✓	13	37%
Leiblin Park	✓	✓					40	33%
Balsam Subdivision					✓		1	8%
Uplands Park					✓	✓	0	0%
Wanda Lane				✓		✓	TBD	TBD
Crescent Avenue (MH182)	✓	✓	✓			✓	43	74%
Crescent Avenue (MH174)	✓	✓	✓			✓	41	92%





## Fairview, Clayton Park & Bridgeview: Project Summary

The analysis of flow monitoring data, undertaken as part of the West Region Wastewater Infrastructure Plan, identified the potential for a significant reduction in Rainfall Derived Inflow and Infiltration (RDII) in the Fairview, Old Clayton Park and Bridgeview areas. With the goal of reducing peak flows by 212 l/s, a multi-year I/I reduction program was initiated in 2017.

The first phase of the project in the summer/fall of 2018, represented the first large scale RDII reduction project undertaken by Halifax Water outside of the pilot program. The first two years of post-monitoring results indicate a reduction of 166 l/s of peak flow with the expectation that the target of 212 l/s will be achieved once the second phase of the wastewater main lining is complete. Phase 2 involves approximately 9,500 m of wastewater main lining in the Old Clayton Park and Bridgeview sewersheds and has been underway since Fall 2019, with a planned completion of Summer 2020. A cumulative reduction of peak flow for the combined sewersheds will be calculated and reported following post-rehabilitation flow monitoring of the Phase 2 project area.

**11,500  
METRES**

### Project Totals to Date

The project saw approximately 11,500 m of CIPP wastewater main lining in the Fairview sewershed.

Flow monitoring and data analysis will continue to be performed to confirm RDII reductions for the full project area.

Next steps have the WWMP continuing with monitoring of pilot activities, including one focused on private-side only intervention and investigating identified sewersheds in the Central and East regions (Eastern Passage and Fish Hatchery sewersheds).

## 2019/20 Wastewater Mainline Trenchless Lining Projects

In 2019, Halifax Water conducted two separate sewer lining project phases. These projects consisted of the trenchless and non-disruptive construction application of cured-in-place pipe (CIPP) technology to rehabilitate ageing wastewater and combined (wastewater and stormwater) sewer mains.

Phase 1 included the rehabilitation of sewer mains at 12 street sites in peninsular Halifax and one street in Dartmouth. The total lining for this phase was approximately 4,365 meters. Phase 2 included the rehabilitation of wastewater sewers at 29 street sites predominately in the Fairview area. The total lining for this phase was approximately 9,035 meters of sewers. Phase 2 lining provided the added benefit of sealing the existing sewer pipe and reducing storm and groundwater infiltration.

The lining work included significant communication efforts with stakeholders and area residents throughout all stages of the work. Portions of both phases remain for next year.

**5,895  
METRES**

### 2019/20 Sewer Lining Totals

Overall, ending March 2020, a total of 5,895 m of sewers for both phases had been lined, which represented 44% of both phases of work overall. The final estimated value for Phase 1 is \$1.77 M, and Phase 2 is \$1.99 M.



# Halifax Water launches Horizon 2040: Wastewater Treatment Innovation for Continuous Improvement of Effluent Quality

Halifax Water, in collaboration with Dalhousie University, was successful in securing a grant from Natural Sciences and Engineering Research Council of Canada (NSERC) for wastewater treatment innovation for continuous improvement of effluent quality.

Halifax Water operates three chemically enhanced primary wastewater facilities. Stricter compliance requirements are on the horizon with respect to the Federal Wastewater Systems Effluent Regulations, and the three plants are close to meeting these requirements as they operate today. It is recognized that capital investment in the order of \$425 million would be required to achieve compliance with Wastewater System Effluent Regulations by 2040.

There are numerous opportunities for optimization of the existing processes that may bring the plants into compliance without the need for upgrades to secondary treatment. Optimization can occur through exploration and development of new process monitoring tools for chemical dosing decision making, understanding and addressing hydraulic issues within the process, and optimization of chemical additives (alternative coagulants, coagulant aids, etc.). Improvements to TSS and BOD removal within the plants will also improve UV transmittance and lower operation and maintenance costs associated.

Halifax Water currently supports the NSERC/Halifax Water Industrial Research Chair and has seen tremendous value in this partnership, including direct improvements to treatment processes, reduced capital and operating costs, and implementation of policies for improvement to public health. There have been equally important

benefits of; developing a strong, highly qualified personnel training program; building a network of excellence for water treatment in the Atlantic Region; and enabling Halifax Water to be at the leading edge of innovations in the drinking water industry. Halifax Water is looking

forward to expanding our research to embrace opportunities in the wastewater sector and enhance our commitment to environmental stewardship. Halifax Water sees the same potential benefits and value in engaging in this research partnership as a start to developing a strong wastewater research program in Atlantic Canada.



Dr. Amina Stoddart, P.Eng.  
Assistant Professor, Dalhousie University  
(Photo Credit: Danny Abriel)





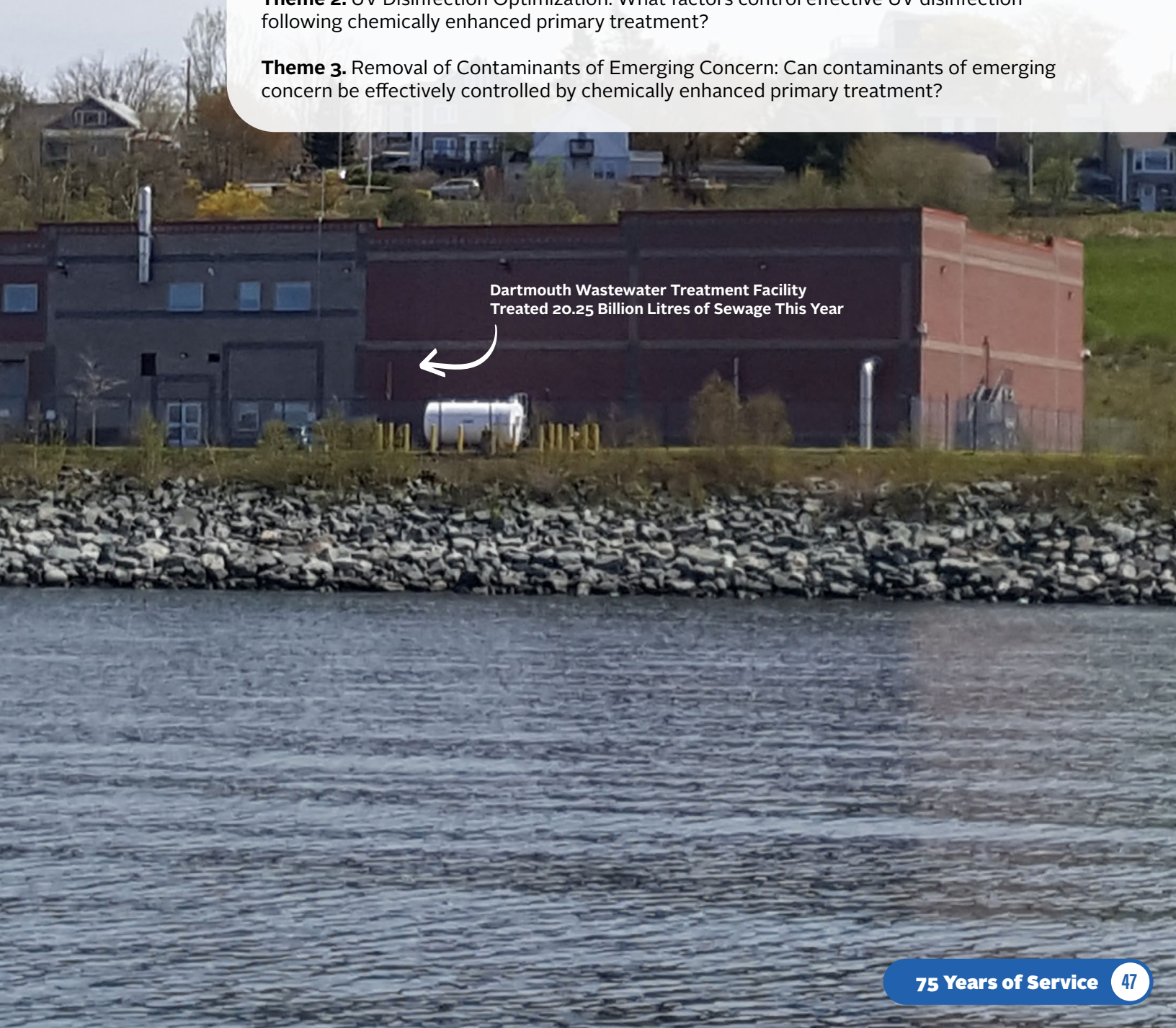
Research efforts at Dalhousie University focus on five Signature Research Clusters that are designed to align with the United Nations' 2030 Agenda for Sustainable Development, which includes 17 Sustainable Development Goals (SDGs). The proposed research aligns with Dalhousie's Clean Tech, Energy, the Environment research cluster and the Clean Water and Sanitation SDG. The Faculty of Engineering will support the proposed research with dedicated laboratory space to establish a research hub for municipal wastewater treatment research. The research will also use advanced analytical equipment available in the Clean Water Technology Laboratory to expand the overall research capacity of the team.

The objective of this project is to improve effluent quality. The research project is driven by the following thematic research questions:

**Theme 1.** Chemically Enhanced Primary Treatment Optimization: Can effluent standards be achieved by chemically enhanced primary treatment systems through coagulation optimization?

**Theme 2.** UV Disinfection Optimization: What factors control effective UV disinfection following chemically enhanced primary treatment?

**Theme 3.** Removal of Contaminants of Emerging Concern: Can contaminants of emerging concern be effectively controlled by chemically enhanced primary treatment?





# SAFETY & SECURITY



## Safety Audits & Training

Halifax Water and its Employees are committed to providing a healthy and safe work environment to prevent occupational illness and injury. This commitment is based upon our understanding that health and safety is a core business function for our organization and is treated as a priority in our work.

To ensure this, Halifax Water continues to evaluate, develop and improve safety and security initiatives across the organization. A key part of Halifax Water's Occupational Health and Safety program is to involve all employees in the identification of hazards or potential hazards when performing work and to develop Standard Operating Procedures (SOP's) for critical tasks. To ensure the effectiveness and understanding of these SOP's Halifax Water continues to review, update and educate our employees on all SOP's they perform utilizing tools such as weekly safety talks.

Halifax Water's Joint Occupational Health and Safety Committees continue to function at a high level, performing facility inspections, reviews Near Miss report and monthly audits and conducting incident investigations. This year, the committees completed ten incident investigations that resulted in changes to safe work practices, standard operating procedures and the purchasing of new equipment.

Halifax Water has been able to see the success of these initiatives, with the average score on internal safety audits being 89%, and there were only 1.6 lost time accidents per 100 employees this past year.

89%





19



20

21

## Incident Command System

The Incident Command System (ICS) is a standardized approach to the command, control, and coordination of emergency response providing a common hierarchy within which responders from multiple agencies can be effective. Halifax Water continues to utilize the ICS system when managing water main and forcemain breaks, and as a planning tool for larger multi-faceted projects.

The regular use of ICS allowed for staff to manage operations through Hurricane Dorian when it arrived on September 7, 2019. Staff began preparing the week leading up to the hurricane, getting the appropriate organizational structure within ICS in place.

Halifax Water activated its Emergency Operations Centre (EOC) at 455 Cowie Hill and had representatives at the HRM EOC in Woodside for the first 36 hours. The Incident Commander (IC) oversaw the operation activities and made decisions on what was required to ensure continued service to customers and protection of the environment, all while working safely. The ICS structure allowed for resources, employees, equipment and fuel, to be deployed to the priority areas and coordination with HRM, NSPI and NSE as needed throughout the event.

After the event had passed and normal operations resumed, a debrief was held to discuss and document some “lessons learned” to be even bettered prepared for the next similar event.







# MOTIVATED & SATISFIED EMPLOYEES





The 2019/20 fiscal year was one that saw many changes at Halifax Water. Managing change is critical to helping ensure employees are engaged, motivated and satisfied.

In response to the annual Employee Satisfaction Survey, a committee was established to focus on items in the survey that declined more than 10% from the previous fiscal year. Employee communications, recognition, development, diversity and inclusion and wellness were the key areas that were enhanced to provide for a better employee experience.

New five-year collective agreements were signed and implemented in June 2019 for CUPE Local 227 and 1431. These new agreements provide more clear gender-neutral language and wage parity as well as the phasing out of the pre-retirement leave.

Having a workplace that is Psychological Healthy and Safe is paramount at Halifax Water. In the fall of 2019, Halifax Water provided Psychologically Safe Workplace training to all Managers and Supervisors. This training will be rolled out to the remaining staff in 2020-21.

Work continued on the new Telus ViP payroll system. Telus ViP will provide Manager and Employee self-service portals, making the reporting of time and requesting of leave easier, while providing immediate access to pay-related information. The solution is robust, easy to use, flexible and accessible from anywhere on any device. This implementation was delayed due to COVID-19, however, the project team has worked diligently and are on track to go live in summer 2020.

**Editorial Note:** The ViP Payroll system launched in August 2020.



## Employee Recognition Program

Halifax Water's Employee Recognition Program is a utility-wide program designed to encourage employees to congratulate or thank each other for a job well done, putting in an extra effort, or for on-going superior performance that helps Halifax Water to provide world class services for our customers and our environment. There were 341 Employee recognitions received in 2019/20.



## The Carolyn Bruce Customer Service Excellence Award

For more than 22 years, Carolyn Bruce set the standard for customer service excellence as a Customer Service Representative and a Customer Care Supervisor. Sadly, Carolyn passed away in January 2011. Carolyn left a legacy of passionate and dedicated service to all she dealt with.

In honour and memory of Carolyn, the Carolyn Bruce Customer Service Excellence Award was created in 2012 and is presented once a year at the annual Service Awards Banquet. Employees recognized for providing exemplary Customer Service may be selected to receive this award. In addition, direct nominations from Halifax Water employees are encouraged. Once again this year, many nominations were received, and the award was presented to David Hiscock for his exemplary customer service.

To further enhance this program, a perpetual plaque for The Carolyn Bruce Customer Service Excellence Award was created to recognize past and present award recipients. In addition to receiving their personal award, the recipient's name will appear on the perpetual plaque. Each employee who has received this award since its inception in 2012 will be remembered and recognized for all to see.







## Service Awards

### 30 Years of Service

#### Wastewater and Stormwater Services

Randy Shrum

#### Water Services

Terrance Nelson

Anthony Tooke

Alan Ossinger

### 25 Years of Service

#### Engineering and Information Services

Jamie Hannam

#### Water Services

John Gaudet

Kevin Kelloway

### 20 Years of Service

#### Corporate Services

Greg Harding

#### Regulatory Services

Chris Marks

#### Water Services

Glen Campbell

Paul Boiduk

### 15 Years of Service

#### Corporate Services

Amanda Seguin

Ann Marie Sturgeon

#### Engineering and Information Services

Darcy Josey

Kim Fawcett

Michelle MacDonald

#### Wastewater and Stormwater Services

Richard Lowe

Belinda Dickson

#### Water Services

Bill Stevens

Cheryl MacEachern

Kenneth Eisnor

Trish Simms

Employee commitment and dedication to service mean a great deal to Halifax Water, and we wish to continue the tradition of recognition and show our appreciation to our employees. Keep up the excellent work!

### 10 Years of Service

#### Administration

James Campbell

Rebecca Rowe

#### Corporate Services

Amanda Jodrey

Heather Britten

Ingrid Elliott

Jennifer Hiscock

Shiju Matthew

Tanya Houlihan

#### Engineering and Information Services

Brad Baxter

David Waterfield

Evan Embree

Kevin Healy

Lucie Kendell

Steven Doucet

Susan Dwyer

#### Regulatory Services

Amanda O'Neil

Kevin Gray

Marielle Pearce

Mary Anne Orman

#### Wastewater and Stormwater Services

Bruce Mellor

Christian Caron

Christian Croft

Dwayne Bell

Gregory Merrick

Jean-Paul Michaud

Justin Beaver

Katie MacDougall

Matthew Iorianni

Melvin Gilliam

Michael Deagle

Nigel Crouse

Pierre Noel

Robert Carroll

Robert MacKenzie

Shawn Borden

Stephen Henneberry

#### Water Services

Colin Waddell

Justin Wilson

Kevin Healey

Mike Doucette



# CORPORATE SOCIAL RESPONSIBILITY

Halifax Water Trucks  
Ready for The World's  
Largest Truck Convoy with  
Special Olympics NS



Halifax Water strives every day to provide world-class water, wastewater and stormwater services to customers. We also work to be part of the community throughout the year, supporting a wide variety of events, causes and groups.

For years, Halifax Water has supported Special Olympics Nova Scotia. The World's Largest Truck Convoy is one that allows staff to show their pride in their machines and put a smile on the faces of many Special Olympians. The 2019 Convoy left CFB Shearwater with 200 trucks winding their way through Dartmouth, Cole Harbour, and Eastern Passage before returning to CFB Shearwater. Along with a \$1,500 sponsorship of the event, Halifax Water was well represented with an impressive fleet of eight trucks. The pride in their trucks was evident as each machine was in showroom condition.



# Halifax Water Employees Fundraising Activities

Halifax Water employees take their role in helping to better the community seriously. That is reflected in the many fundraising initiatives such as United Way Halifax. In 2019 Halifax Water employees raised \$945.00 for United Way Halifax through fundraising events.

Halifax Water's H2O (Help to Others) Fund raised a total of \$4,111.00 to assist customers who truly need help with their water/wastewater/stormwater bill. This internal staff fundraising is in addition to the \$25,000.00 Halifax Water provides in funding. Halifax Water also matches funds donated by Halifax Water employees.

Halifax Water employees also donated \$9,980.00 to Water for People to support the digging of wells to provide clean drinking water in 9 different countries for 4 million people.

The Christmas Families Fundraising initiatives donated \$2,802.75. The funds were divided equally between Byrny Hours, Feed NS, Hope Cottage, Souls Harbour Mission and the H2O Fund.

For many years Halifax Water staff have supported the Salvation Army's Angel Tree program. This year staff committed to sponsoring 100 children. We exceeded our goal by collecting toys, hats and mittens for 105 children.

Halifax Water employees also regularly participate in drives to provide gently used coats, footwear, clothes and even some used toys to those in need. This year seven large bags of goods were donated.

**\$190,000**

**H2O Fund Total**  
Since its launch in 2011, the H2O Fund has dispersed over \$190,000.



## First Nations Water Authority

Access to safe, reliable water and wastewater services is something most of us take for granted. But for many First Nations in our region and across the country, there is no access to safe drinking water or wastewater service.

Since 2017 Halifax Water, in conjunction with industry professionals and researchers, has been working with the Atlantic Policy Congress of First Nations Chiefs Secretariat (APC) to address the issue of water and wastewater services on member communities in Atlantic Canada. The goal, create a regional water authority owned and operated by First Nations people that will not only improve public health and safety but support economic growth and protect the environment. The work continued throughout 2019.

In June 2020, the Atlantic First Nations Water Authority (AFNWA) and the Government of Canada announced the signing of a framework agreement that creates a path for the transfer of water and wastewater services for 15 First Nations communities in Atlantic Canada from Indigenous Services Canada (ISC) to the AFNWA. This agreement is a key milestone as the AFNWA continues to work towards self-determination and greater control of First Nation services delivery by First Nations.



## Supporting Events in the Community



Halifax Water was again very actively involved in the community in 2019 with its Portable Water Station Program. The program, which has been in place since 2009, supports a wide variety of community groups ranging from large venues such as the Jazzfest and multicultural events to smaller community block parties and sporting activities. This support helps groups reduce or eliminate their use of bottled water and the associated waste generated by plastic water bottles, promotes conservation and the use of tap water. In the 2019 season, Halifax Water provided water stations to 38 events.

Thirty Halifax Water employees took to the streets for the 2019 Scotiabank Bluenose Marathon. “The Running Jokes” as they have named themselves, were no joke when it came to raising funds for Special Olympics Nova Scotia. Through a BBQ, 50/50 draw and individual fundraising efforts, the team raised \$2008. The Shed wrapped up its second successful season on the Halifax waterfront after having spent July and August at its prime boardwalk location near the beach volleyball/sand beach area. Visitors took part in water taste tests (bottled vs. tap), trivia questions, viewed a variety of educational videos, enjoyed a glass of cool, refreshing tap water, took part in games and activities, and generally enjoyed the relaxed atmosphere and fantastic waterfront location.

The Shed was a hit with local residents and visitors from around the world who came to see why Halifax Water is known internationally as a world-class utility.


The map pictured on this page was at The Shed this summer. Visitors who dropped by were asked where they were from, and a stick pin was placed in that location. The map shows visitors from every continent made their way to Halifax municipality and The Shed.

An estimated 13,000 visitors visited The Shed in 2019, up from an estimated 9,000 in 2018.

**13,000 VISITORS**







The Shed on the Boardwalk  
in Downtown Halifax

## Scholarships

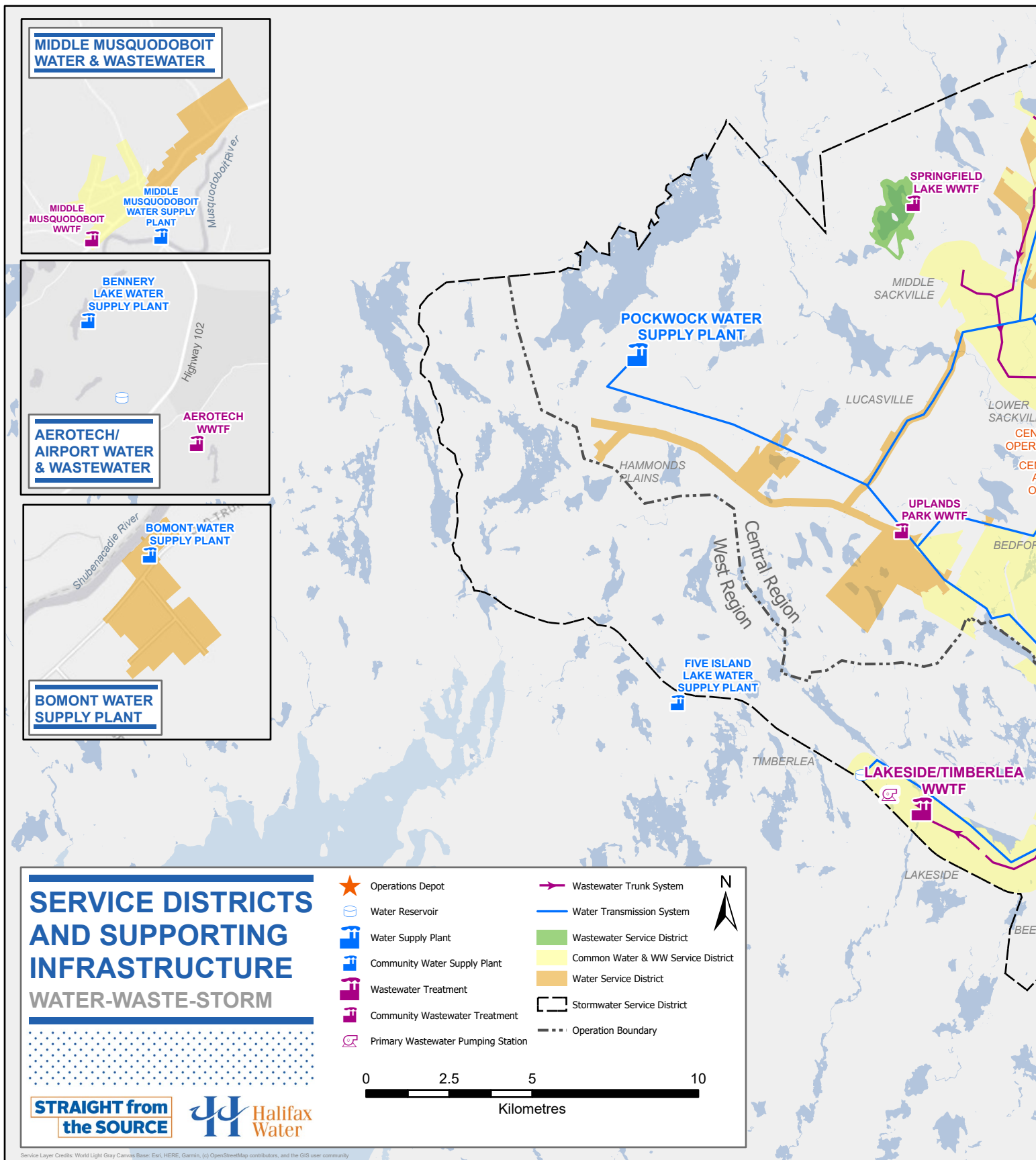
Halifax Water has supported the educational growth of our community since 2008 through scholarships provided to the Nova Scotia Community College. The scholarships not only benefit the community and recipients, but they have also provided Halifax Water many highly skilled and motivated employees over the years. Along with the four scholarships provided annually, Halifax Water has added a new scholarship for 2020/21:

- Robert T. Peacock Achievement Award – 1 @ \$2,000 awarded each Fall
- Jipuktuk etli apatua'timk Award – 1 @ \$4,000 awarded each Spring; 1 @ \$4,000 awarded each Fall
- Halifax Water Achievement Award – 1 @ \$2,000 awarded each Fall
- Arnold D. Johnson Sr. Award for Water Resources – 1 @ \$3,600 awarded each Spring

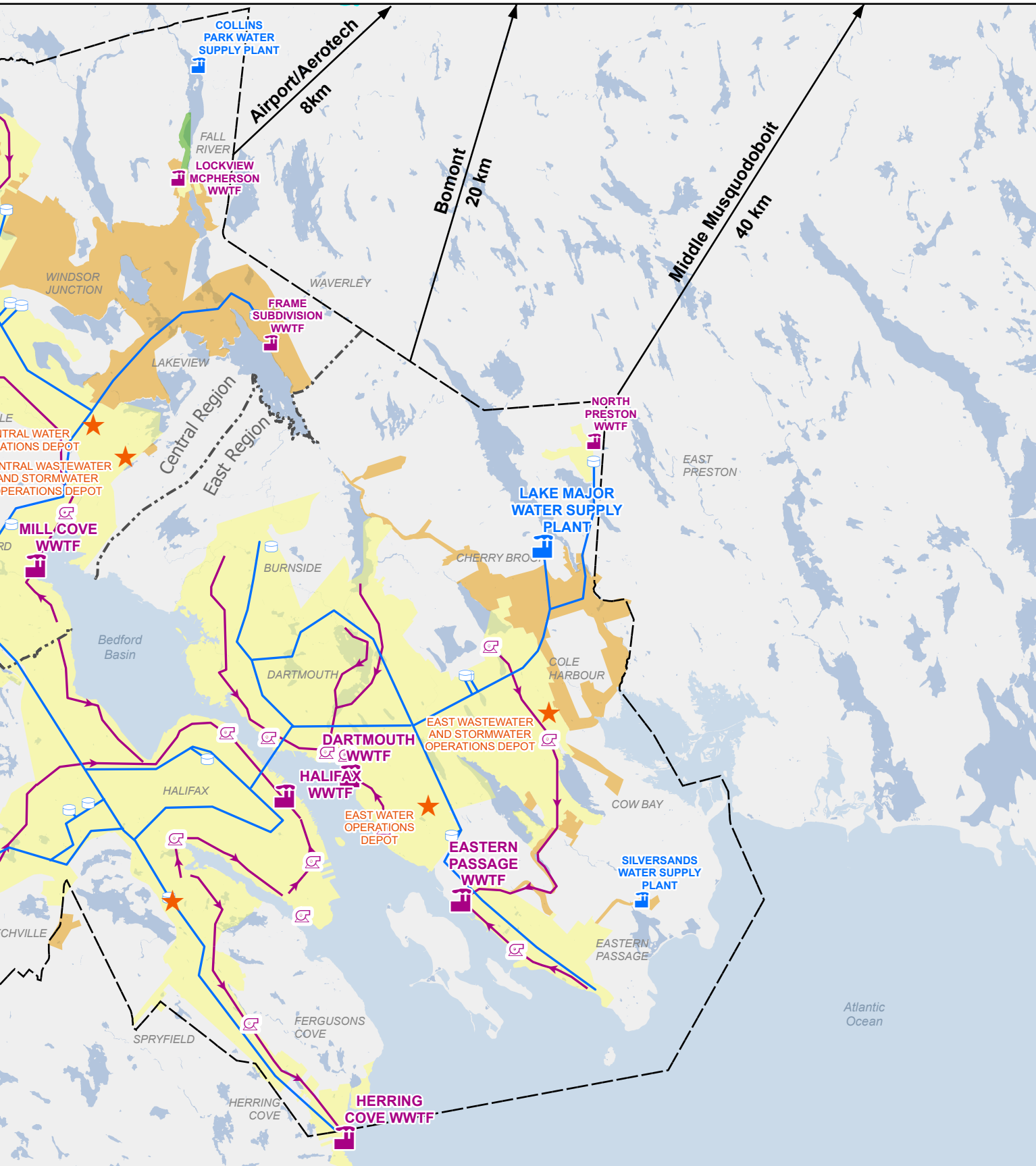
**NEW IN  
2020/21**

Halifax Water has a new scholarship, Women in Non-Traditional Careers; 1 @ \$2,000 to be awarded each Fall. This award is open to women entering one of the following programs at NSCC: Plumbing, Electrical Construction and Industrial - Diploma, Civil Engineering Technology, Environmental Engineering Technology, Geographic Information Systems Advanced Diploma, or Geographic Information Systems Technician



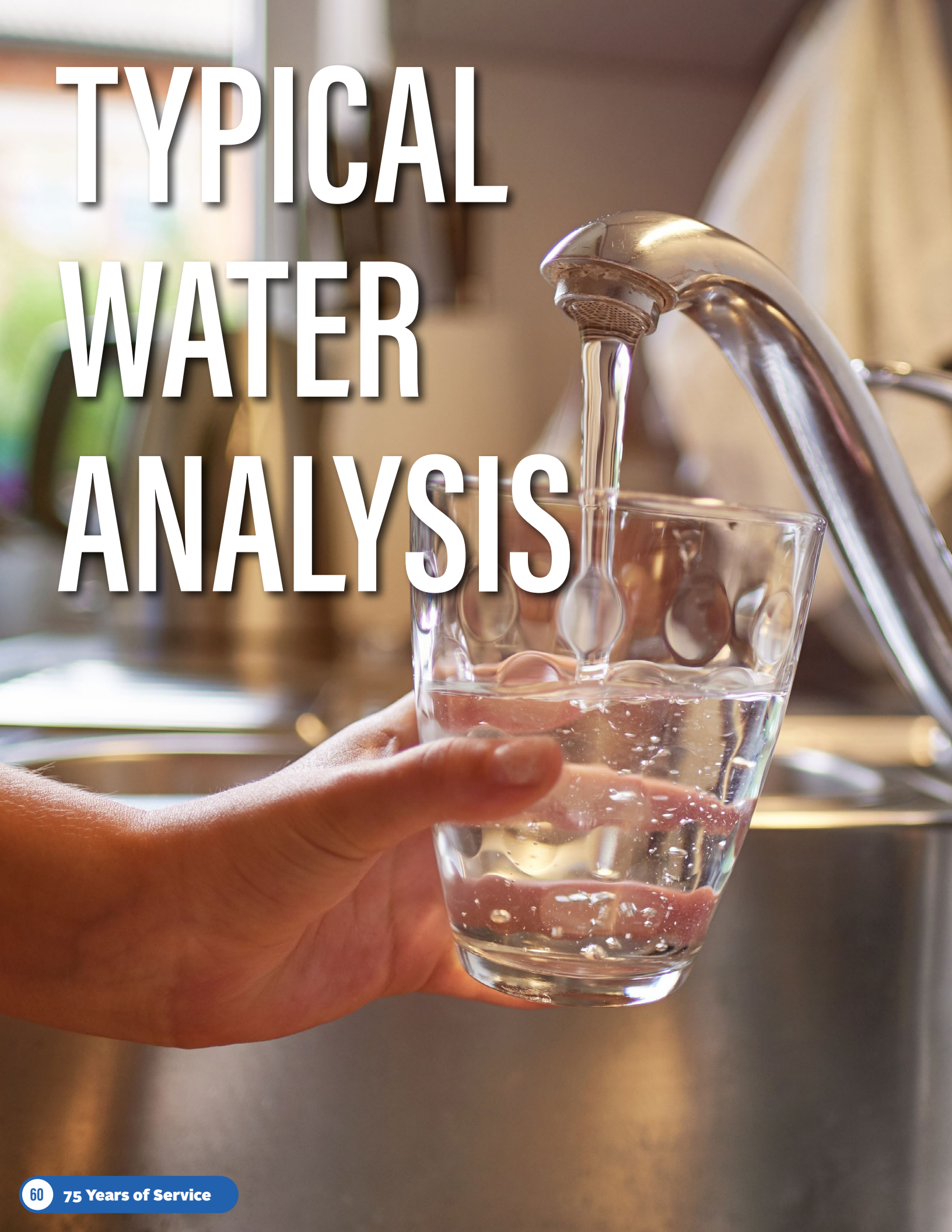








# TYPICAL WATER ANALYSIS

A close-up photograph of a hand holding a clear glass under a chrome faucet. Water is flowing from the faucet into the glass, creating bubbles. The background is a blurred kitchen setting. The text 'TYPICAL WATER ANALYSIS' is overlaid in large, white, bold, sans-serif capital letters on the left side of the image.



# TYPICAL ANALYSIS OF POCKWOCK LAKE & LAKE MAJOR WATER

2019 - 2020

(in milligrams per litre unless shown otherwise)

Note: All Regulatory Compliance Analysis are Processed by Third Party Laboratories

PARAMETERS	(Halifax) POCKWOCK		(Dartmouth) LAKE MAJOR		GUIDELINES FOR CANADIAN DRINKING WATER QUALITY	
	Raw Water	Treated Water	Raw Water	Treated Water	Maximum Acceptable Concentration	Aesthetic Objective Concentration
Alkalinity (as CaCO <sub>3</sub> )	<5.0	18.0	<5.0	19.0	-	-
Aluminum	0.104	<sup>A</sup> 0.088	0.197	<sup>A</sup> 0.014	-	<sup>A</sup> 0.20/0.10
Ammonia (N)	<0.050	<0.050	<0.050	<0.050	-	-
Arsenic	<0.001	<0.001	<0.001	<0.001	0.010	-
Calcium	1.0	4.3	1.0	14.0	-	-
Chloride	6.4	8.7	6.0	7.6	-	≤250
Chlorate	<0.10	<0.10	<0.10	<0.10	1.0	-
Chlorite	<0.10	<0.10	<0.10	<0.10	1.0	-
Colour (True Colour Units)	17.0	<5.0	39.0	<5.0	-	≤15.0
Conductivity (µS/cm)	32.0	72.0	32.0	110.0	-	-
Copper (Total)	0.0450	<0.0005	0.0537	0.0013	2.0	≤1.0
Fluoride	<0.10	0.52	<0.10	<sup>B</sup> 0.49	1.5	-
Hardness (as CaCO <sub>3</sub> )	3.9	13.0	4.0	32.0	-	-
HAA <sub>5</sub> (avg.)	-	0.014	-	0.028	0.080	-
Iron (Total)	0.03	<0.05	0.09	<0.05	-	≤0.3
Langelier Index @ 4°C	-	-2.41	-	-1.97	-	-
Langelier Index @ 20°C	-	-2.16	-	-1.72	-	-
Lead (Total) (µg/l)	<0.50	<0.50	<0.50	<0.50	5.0	-
Magnesium	0.390	0.402	0.395	0.410	-	-
Manganese (Total)	0.022	0.015	0.053	<0.002	0.12	≤0.05
Mercury (µg/l)	<0.013	<0.013	<0.013	<0.013	1.0	-
Nitrate (as N)	<0.050	<0.050	<0.050	<0.050	10.0	-
Nitrite (as N)	<0.010	<0.010	<0.010	<0.010	1	-
pH (pH Units)	6.1	7.3	5.9	7.2	-	7.0 - 10.5
Potassium	0.230	0.290	0.250	0.240	-	-
Sodium	4.3	12.0	4.0	9.3	-	≤200
Solids (Total Dissolved)	31.0	57.0	31.5	84.0	-	≤500
Sulphate	3.2	8.8	3.2	28.0	-	≤500
Turbidity (NTU)	0.33	<sup>C</sup> 0.06	0.39	<sup>C</sup> 0.04	<sup>C</sup> 0.15/0.2	-
Total Organic Carbon (TOC)	3.80	3.00	5.50	1.90	-	-
THM's (avg.)	-	0.027	-	0.039	0.100	-
Uranium (µg/l)	<0.10	<0.10	<0.10	<0.10	20.0	-
Zinc (Total)	<0.005	0.098	<0.005	0.088	-	≤5.0
PCB (µg/l)	<0.05	<0.05	<0.05	<0.05	-	-
Gross Alpha / Gross Beta (Bq/L)	<0.10/<0.10	<0.10/<0.10	<0.10/<0.10	<0.10/<0.10	0.5 / 1.0	-

<sup>A</sup>Aluminum objective is related to type of plant filtration; the aluminum objective for direct filtration (Pockwock) is <0.20 mg/l and conventional filtration (Lake Major) is <0.10 mg/l.

<sup>B</sup>Fluoride was not being added to the finished water at the Lake Major WSP approximately 65% of the time due to system maintenance.

<sup>C</sup>The Pockwock and Lake Major plants analyze turbidity immediately post-filtration. Each filter must produce water with a turbidity of <0.15 NTU 95% of the time at the Pockwock Water Supply Plant and <0.20 NTU 95% of the time at the Lake Major Water Supply Plant. Both Water Supply Plants must produce water with a turbidity <1.00 NTU 100% of the time, as required by Provincial Permit.



# TYPICAL ANALYSIS – SMALL SYSTEMS

2019 - 2020

(in milligrams per litre unless shown otherwise)

Note: All Regulatory Compliance Analysis are Processed by Third Party Laboratories

PARAMETERS	BENNERY LAKE		FIVE ISLAND LAKE		GUIDELINES FOR CANADIAN DRINKING WATER QUALITY	
	Raw Water	Treated Water	Raw Water	Treated Water	Maximum Acceptable Concentration	Aesthetic Objective Concentration
Alkalinity (as CaCO <sub>3</sub> )	10.2	41.0	31.0	32.0	-	-
Aluminum	0.099	0.016	<0.005	<0.005	-	0.2
Ammonia (N)	<0.050	<0.050	0.115	<0.050	-	-
Arsenic	<0.001	<0.001	0.004	0.004	0.010	-
Calcium	2.6	19.0	9.9	9.5	-	-
Chloride	7.6	9.5	9.2	9.8	-	≤250
Chlorate	<0.10	0.28	<0.10	0.19	1.0	-
Chlorite	<0.10	<0.10	<0.10	<0.10	1.0	-
Colour (True Colour Units)	35.0	<5.0	<5.0	<5.0	-	≤15.0
Conductivity (µS/cm)	36.0	140.0	88.0	88.0	-	-
Copper (Total)	0.059	0.018	0.002	0.010	2.0	≤1.0
Fluoride	<0.10	<0.10	0.33	0.37	1.5	-
Hardness (as CaCO <sub>3</sub> )	8.6	48.0	30.0	28.0	-	-
HAA5 (avg.)	-	0.025	-	<0.005	0.080	-
Iron (Total)	0.33	<0.05	<0.05	<0.05	-	≤0.3
Langelier Index @ 4°C	-	-1.41	-2.07	-1.48	-	-
Langelier Index @ 20°C	-	-1.16	-1.82	-1.23	-	-
Lead (Total) (µg/l)	<0.50	<0.50	<0.50	<0.50	5.0	-
Magnesium	0.555	0.645	1.2	1.1	-	-
Manganese (Total)	0.185	0.020	<0.002	<0.002	0.12	≤0.05
Mercury (µg/l)	<0.013	<0.013	<0.013	<0.013	1.0	-
Nitrate (as N)	0.059	0.069	<0.050	<0.050	10.0	-
Nitrite (as N)	<0.010	<0.010	<0.010	<0.010	1.0	-
pH (pH Units)	6.5	7.6	7.0	7.6	-	7.0 - 10.5
Potassium	0.280	0.320	0.50	0.49	-	-
Sodium	4.5	15.0	6.0	6.9	-	≤200
Solids (Total Dissolved)	45.5	114.0	56.0	65.0	-	≤500
Sulphate	10.8	29.0	3.3	3.7	-	≤500
Turbidity (NTU)	3.73	<sup>A</sup> 0.04	0.41	<sup>B</sup> 0.04	<sup>A</sup> 0.2/1.0 <sup>B</sup> 1.0	-
Total Organic Carbon (TOC)	3.90	2.10	<0.50	<0.50	-	-
THM's (avg.)	-	0.036	-	<0.001	0.100	-
Uranium (µg/l)	<0.10	<0.10	10.00	9.90	20.0	-
Zinc (Total)	0.013	0.040	0.006	<0.005	-	≤5.0
PCB (µg/l)	<0.05	<0.05	<0.05	<0.05	-	-
Gross Alpha / Gross Beta (Bq/L)	<0.10/<0.10	<0.10/<0.10	0.35/0.53	0.42/<0.10	0.5 / 1.0	-

<sup>A</sup>The Bennery Lake plant analyzes turbidity immediately post-filtration and must produce water with a turbidity of <0.20 NTU 95% of the time and <1.00 NTU 100% of the time.

<sup>B</sup>The Five Island Lake plant must produce water with turbidity of <1.00 NTU 95% of the time, as required by Provincial Permit. Treated water turbidity is calculated from clearwell monitoring.



# TYPICAL ANALYSIS - SMALL SYSTEMS

2019 - 2020

(in milligrams per litre unless shown otherwise)

Note: All Regulatory Compliance Analysis are Processed by Third Party Laboratories

PARAMETERS	COLLINS PARK		MIDDLE MUSQUODOBOIT		GUIDELINES FOR CANADIAN DRINKING WATER QUALITY	
	Raw Water	Treated Water	Raw Water	Treated Water	Maximum Acceptable Concentration	Aesthetic Objective Concentration
Alkalinity (as CaCO <sub>3</sub> )	11.0	10.0	49.0	160.0	-	-
Aluminum	0.047	0.005	0.005	0.006	-	0.2
Ammonia (N)	<0.050	0.051	<0.050	<0.050	-	-
Arsenic	0.003	<0.001	<0.001	<0.001	0.010	-
Calcium	6.1	0.7	15.0	2.7	-	-
Chloride	37.0	17.0	12.0	4.3	-	≤250
Chlorate	<0.10	0.17	<0.10	<0.10	1.0	-
Chlorite	<0.10	<0.10	<0.10	<0.10	1.0	-
Colour (True Color Units)	19.0	<5.0	<5.0	<5.0	-	≤15.0
Conductivity (µS/cm)	140.0	60.0	150.0	240.0	-	-
Copper (Total)	0.0008	<0.0005	0.0006	0.0014	2.0	≤1.0
Fluoride	<0.10	<0.10	<0.10	<0.10	1.5	-
Hardness (as CaCO <sub>3</sub> )	19.0	1.6	59.0	11.0	-	-
HAA5 (avg.)	-	<0.005	-	<0.005	0.080	-
Iron (Total)	0.10	<0.05	<0.05	<0.05	-	≤0.3
Langelier Index @ 4°C	-2.64	-3.59	-1.85	-1.34	-	-
Langelier Index @ 20°C	-2.39	-3.33	-1.60	-1.09	-	-
Lead (Total) (µg/l)	<0.50	<0.50	<0.50	<0.50	5.0	-
Magnesium	0.85	<0.10	5.10	0.99	-	-
Manganese (Total)	0.056	<0.002	<0.002	<0.002	0.12	≤0.05
Mercury (µg/l)	<0.013	<0.013	<0.013	<0.013	1.0	-
Nitrate (as N)	0.093	0.073	1.160	0.900	10.0	-
Nitrite (as N)	<0.010	<0.010	<0.010	<0.010	1	-
pH (pH Units)	7.2	7.2	7.0	7.9	-	7.0 - 10.5
Potassium	0.87	0.36	1.00	0.51	-	-
Sodium	22.0	13.0	6.6	55.0	-	≤200
Solids (Total Dissolved)	91.0	40.0	100.0	150.0	-	≤500
Sulphate	7.0	2.0	12.7	<2.0	-	≤500
Turbidity (NTU)	1.00	<sup>A</sup> 0.04	0.14	<sup>A</sup> 0.06	<sup>A</sup> 0.1/0.3	-
Total Organic Carbon (TOC)	4.50	<0.50	0.68	<0.50	-	-
THM's (avg.)	-	0.008	-	0.002	0.100	-
Uranium (µg/l)	<0.10	<0.10	<0.10	<0.10	20.0	-
Zinc (Total)	<0.005	0.081	<0.005	0.042	-	≤5.0
PCB (µg/l)	<0.05	<0.05	<0.05	<0.05	-	-
Gross Alpha / Gross Beta (Bq/L)	<0.10/<0.10	<0.10/<0.10	<0.10/<0.10	<0.10/<0.10	0.5 / 1.0	-

<sup>A</sup>Ultra-filtration membrane plants must produce water with turbidity of <0.10 NTU 99% of the time and <0.30 NTU 100% of the time, as required by Provincial Permit. Treated water turbidity is calculated from clearwell monitoring.



# TYPICAL ANALYSIS OF BOMONT WATER

2019 - 2020

(in milligrams per litre unless shown otherwise)

Note: All Regulatory Compliance Analysis are Processed by Third Party Laboratories

PARAMETERS	BOMONT		Silver Sands		GUIDELINES FOR CANADIAN DRINKING WATER QUALITY	
	<sup>A</sup> Raw Water	Treated Water	Raw Water	Treated Water	Maximum Acceptable Concentration	Aesthetic Objective Concentration
Alkalinity (as CaCO <sub>3</sub> )	-	18.0	69.0	70.0	-	-
Aluminum	-	0.071	<0.005	<0.005	-	0.2
Ammonia (N)	-	<0.050	0.140	<0.050	-	-
Arsenic	-	<0.001	0.002	<0.001	0.010	-
Calcium	-	4.5	38.0	36.0	-	-
Chloride	-	9.8	64.0	66.0	-	≤250
Chlorate	-	0.36	<0.10	0.35	1.0	-
Chlorite	-	<0.10	<0.10	<0.10	1.0	-
Colour (True Colour Units)	-	<5.0	23.8	<5.0	-	≤15.0
Conductivity (µS/cm)	-	80.0	350.0	360.0	-	-
Copper (Total)	-	0.001	<0.0005	0.0106	2.0	≤1.0
Fluoride	-	<0.10	0.23	0.18	1.5	-
Hardness (as CaCO <sub>3</sub> )	-	13.0	110.0	110.0	-	-
HAA5 (avg.)	-	0.066	-	<0.005	0.080	-
Iron (Total)	-	<0.05	1.08	<0.05	-	≤0.3
Langelier Index @ 4°C	-	-2.39	-0.75	-0.69	-	-
Langelier Index @ 20°C	-	-2.13	-0.50	-0.44	-	-
Lead (Total) (µg/l)	-	<0.50	<0.50	<0.50	5.0	-
Magnesium	-	0.400	5.000	4.700	-	-
Manganese (Total)	-	0.006	1.163	0.005	0.12	≤0.05
Mercury (µg/l)	-	<0.013	<0.013	<0.013	1.0	-
Nitrate (as N)	-	<0.050	<0.050	<0.050	10.0	-
Nitrite (as N)	-	<0.010	<0.010	<0.010	1	-
pH (pH Units)	-	7.4	7.7	7.6	-	7.0 - 10.5
Potassium	-	0.280	0.900	0.870	-	-
Sodium	-	13.0	23.0	27.0	-	≤200
Solids (Total Dissolved)	-	82.0	220.0	250.0	-	≤500
Sulphate	-	17.7	20.0	19.0	-	≤500
Turbidity (NTU)	-	<sup>B</sup> 0.28	14.5	<sup>C</sup> 0.09	<sup>B</sup> 0.1/ <sup>C</sup> 1.0	-
Total Organic Carbon (TOC)	-	2.0	<0.50	<0.50	-	-
THM's (avg.)	-	0.057	-	<0.001	0.100	-
Uranium (µg/l)	-	<0.10	<0.10	<0.10	20.0	-
Zinc (Total)	-	0.085	<0.005	<0.005	-	≤5.0
PCB (µg/l)	-	<0.05	<0.05	<0.05	-	-
Gross Alpha / Gross Beta (Bq/L)	-	<0.10/<0.10	<0.10/<0.10	<0.10/<0.10	0.5 / 1.0	-

<sup>A</sup>Raw water samples were not collected from the Bomont raw water source this past year. Treated water was supplied from either the Lake Major or Pockwock water systems.

<sup>B</sup>The Bomont Water Supply Plant must produce water with turbidity of <0.10 NTU 99% of the time and <0.30 NTU 100% of the time, as required by Provincial Permit. Treated water turbidity is calculated from clearwell monitoring.

<sup>C</sup>The Silver Sands Water Supply Plant must produce water with turbidity of <1.00 NTU 95% of the time, as required by Provincial Permit. Treated water turbidity is calculated from clearwell monitoring.



# FINANCIAL OVERVIEW





# Financial Overview

## Abbreviated Financial Overview (IFRS)

	Year ended March 31, 2020 '000	Year ended March 31, 2019 '000	\$ Change
<b>ASSETS</b>			
Total current assets	\$ 92,131	\$ 90,008	\$ 2,123
Utility plant in services			
Cost	1,524,594	1,433,062	91,532
Accumulated depreciation	(243,584)	(199,622)	(43,962)
Net utility plant in service	1,281,010	1,233,440	47,570
Intangible assets	18,951	15,418	3,533
Capital work in progress	18,104	29,605	(11,501)
Total non-current assets	1,318,065	1,278,463	39,602
Regulatory deferral account	2,812	3,004	(192)
<b>Total assets and regulatory deferral account</b>	<b>\$ 1,413,008</b>	<b>\$ 1,371,475</b>	<b>\$ 41,533</b>

## LIABILITIES AND EQUITY

Payables, deposits and unearned revenue	\$ 31,852	\$ 26,258	\$ 5,594
Long term debt	219,146	207,441	11,705
Deferred contributed capital	893,948	881,648	12,300
Employee benefit obligations	63,365	72,330	(8,965)
Total liabilities	1,208,311	1,187,677	20,634
Total equity	204,697	183,798	20,899
<b>Total liabilities and equity</b>	<b>\$ 1,413,008</b>	<b>\$ 1,371,475</b>	<b>\$ 41,533</b>

	Year ended March 31, 2020 '000	Year ended March 31, 2019 '000	\$ Change
<b>EARNINGS AND COMPREHENSIVE EARNINGS</b>			
Operating revenues	\$ 137,750	\$ 138,202	\$ (452)
Operating expenses (excluding depreciation and amortization)	(92,630)	(88,726)	(3,904)
Depreciation and amortization	(46,410)	(44,060)	(2,350)
Earnings from operations	(1,290)	5,416	(6,706)
Financial and other revenues	20,236	20,041	195
Financial and other expenditures	(12,611)	(12,861)	250
Earnings for the year	6,335	12,596	(6,261)
Regulatory deferral account depreciation	(192)	(192)	0
Re-measurement on defined benefits plans	14,756	3,734	11,022
<b>Total comprehensive earnings for the year</b>	<b>\$ 20,899</b>	<b>\$ 16,138</b>	<b>\$ 4,761</b>



# Financial Overview

## Abbreviated Financial Overview (NSUARB Handbook)

	Year ended March 31, 2020 '000	Year ended March 31, 2019 '000	\$ Change
<b>ASSETS</b>			
Total current assets	\$ 92,131	\$ 90,008	\$ 2,123
Utility plant in services			
Cost	1,836,187	1,739,067	97,120
Accumulated depreciation	(506,040)	(463,924)	(42,116)
Net utility plant in service	1,330,147	1,275,143	55,004
Capital work in progress	18,104	29,605	(11,501)
Total non-current assets	1,348,251	1,304,748	43,503
Regulatory deferral account	2,812	3,004	(192)
<b>Total assets and regulatory deferral account</b>	<b>\$ 1,443,194</b>	<b>\$ 1,397,760</b>	<b>\$ 45,434</b>

<b>LIABILITIES AND EQUITY</b>			
Payables, deposits and unearned revenue	\$ 31,852	\$ 26,258	\$ 5,594
Long term debt	219,146	207,441	11,705
Employee benefit obligations	63,365	72,330	(8,965)
Total liabilities	314,363	306,029	8,334
Total equity	1,128,831	1,091,731	37,100
<b>Total liabilities and equity</b>	<b>\$ 1,443,194</b>	<b>\$ 1,397,760</b>	<b>\$ 45,434</b>

	Year ended March 31, 2020 '000	Year ended March 31, 2019 '000	\$ Change
<b>EARNINGS AND COMPREHENSIVE EARNINGS</b>			
Operating revenues	\$ 137,750	\$ 138,202	\$ (452)
Operating expenditure (excluding depreciation and amortization)	(79,170)	(77,519)	(1,651)
Dividend/grant in lieu of taxes	(5,078)	(4,999)	(79)
Depreciation and amortization	(25,078)	(23,006)	(2,072)
Earnings from operations	28,424	32,678	(4,254)
Financial and other revenues	1,211	1,899	(688)
Financial and other expenditures	(31,195)	(33,189)	1,994
<b>Earnings (loss) for the year</b>	<b>\$ (1,560)</b>	<b>\$ 1,388</b>	<b>\$ (2,948)</b>











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