

March 18, 2022

Becky Kent, B.A., Chair
Halifax Water
Halifax, NS

The regular meeting of the Halifax Water Board will be held virtually on Thursday, March 24, 2022 beginning at 9:00 a.m. Visit www.halifaxwater.ca to register to attend the public portion of the meeting.

AGENDA

In Camera Reports

- 1C Approval of minutes of the In-Camera meeting held on Thursday, January 27, 2022 (5 minutes)

Motion: That the Halifax Water Board approve the In-Camera minutes of January 27, 2022.

- 2C Business arising from minutes

a)

- 3C-I Legal Matter – Verbal (5 minutes)

- 4C-I Regulatory Matter – Verbal (5 minutes)

- 5C-I Regulatory Matter - Verbal (5 minutes)

- 6C-I Contractual Matter – Presentation (20 minutes)

- 7C-I Regulatory Matter – Verbal (20 minutes)

Regular Reports

1. a) Ratification of In-Camera motions (2 minutes)

Motion: That the Halifax Water Board ratify the In-Camera Motions.

- b) Approval of the order of business and approval of additions and deletions (2 minutes)

Motion: That the Halifax Water Board approve the order of business and approve additions and deletions.

2. Approval of minutes of the Regular meeting held on Thursday, January 27, 2022 (2 minutes)

Motion: That the Halifax Water Board approve the minutes of the January 27, 2022 Regular meeting.

3. Business arising from minutes

a)

Financial

4.1 Operating results for the eleven months ended February 28, 2022 (10 minutes) AC/AS

4.2 2022 Spring Debenture (15 minutes)

Motion: That the Halifax Water Board:

1. Approve the financing of \$15,749,000 with a thirty-year amortization term and finance over ten years. The maximum all-inclusive rate is not to exceed 5.5%.
2. Approve the re-financing of \$17,198,315 with a ten-year amortization term and financing over ten years, with an all-inclusive rate not to exceed 5.5%.

Capital approvals

5.1 Capital expenditures for the eleven months ended February 28, 2022 (5 minutes)

5.2 Cogswell District Energy System (DES) Utility Formation + Initial Capital Approval (30 minutes)

Motion: That the Halifax Water Board approve:

1. Execution of a cost sharing agreement with the Halifax Regional Municipality for construction of the Cogswell District Energy System (DES) distribution piping system wherein \$1,302,780 is the net Halifax Water share of the overall \$3,809,199 construction costs of the Cogswell DES distribution piping system.
2. Capital funding in the amount of \$900,000 for the detailed design of the DES energy centre.
3. Capital funding in the amount \$500,000 for development of the regulated DES including development of the cost of service model, rate studies, operating procedures, business processes and regulations.
4. Application to the Nova Scotia Utility & Review Board for approval of the capital expenditure and establishment of the regulated DES service within Halifax Water based on the established business case.

5.3 Application for Funding for Halifax Water Projects – Investing in Canada Infrastructure Program – Green – Environmental Quality Stream (10 min)

Motion: That the Halifax Water Board authorize staff to apply for funding from the Green – Environmental Quality Stream of the Investing in Canada Infrastructure Program (ICIP) in the current call for nominations, set to close on April 1, 2022 for the following projects:

- Sawmill River Daylighting/Renewal Phase 2
- Lake Major Pumping Station Renewal and New Intake

Other Business

6. Corporate Balanced Scorecard – 2022/23 Program (25 minutes)

Motion: That the Halifax Water Board approve:

1. Corporate Balanced Scorecard targets for the 2022/23 fiscal year as detailed in the attached Corporate Balanced Scorecard summary.
2. The Organizational Award Program tied to the outcomes of 12 Organizational Indicators as detailed in the attached presentation.

7. Diversity, Equity and Inclusion Policy (10 min)

Motion: That the Halifax Water Board endorse the Diversity, Equity and Inclusion framework goals for 2022/23 – 2024/25 as set out in the report dated March 15, 2022.

8. Group Extended Health Plan Enhancement (10 min)

Motion: That the Halifax Water Board approve the following enhancement to the Plan on the next renewal period, effective June 1, 2022:

- To add a Mental Health benefit which includes an overall combined practitioner maximum of \$1,500 for Psychologists, Social Workers, Psychotherapists and Counseling Therapist.

9. Dispute Resolution Officer (5 min)

Information Reports


- 1-I Operational Performance Information Report
- 2-I Halifax Regional Water Commission Employees' Pension Plan Financial Report Fourth Quarter, 2021
- 3-I Halifax Water Supplemental Pension Plan Report
- 4-I 2021 Annual Customer Survey
- 5-I Climate Action Plan Update
- 6-I Water and Wastewater Research Program Update – Dalhousie University




Digitally signed by Heidi
Schedler
Date: 2022.03.18
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Heidi Schedler
Secretary

TO: Becky Kent, B.A., Chair, and Members of the Halifax Regional Water Commission Board

SUBMITTED BY:  Digitally signed by Allan Campbell
Date: 2022.03.16 11:28:59 -03'00' *On behalf of:*

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

APPROVED:  Digitally signed by Cathie O'Toole
Date: 2022.03.16 14:29:01 -03'00' _____
Cathie O'Toole, MBA, FCPA, FCGA, ICD.D
General Manager

DATE: March 18, 2022

SUBJECT: **Operating results for the 11 months ended February 28, 2022**

ORIGIN

Financial Information Reporting.

DISCUSSION

Attached are the operating results for the eleven (11) months ended February 28, 2022, with comparative figures for February 28, 2021.

The following discussion of the operating results reflect direct operating costs by department and allocations among water, wastewater and stormwater for common costs shared across all the services provided by Halifax Water.

Statement of Financial Position (NSUARB)

Key indicators and balances from the Statement of Financial Position are provided in the following tables.

ITEM # 4.1
Halifax Water Board
March 24, 2022

Table 1: Assets

February 28 (in thousands)	Notes	2022	2021	March 31 2021	From Prior Year \$ Change	% Change
Assets						
Current						
Cash and cash equivalents	A	\$ 70,686	\$ 58,565	\$ 48,228	\$ 12,121	20.7%
Receivables						
Customer charges and contractual	B	19,004	15,453	17,155	3,551	23.0%
Unbilled service revenues	C	17,636	19,234	18,246	(1,598)	(8.3%)
Halifax Regional Municipality	D	0	0	2,711	0	0.0%
Inventory		2,204	2,120	2,003	84	4.0%
Prepays	E	1,935	724	1,570	1,211	167.3%
		111,465	96,096	89,913	15,369	16.0%
Capital work in progress	F	76,808	65,357	30,908	11,451	17.5%
Utility plant in service	G	1,290,269	1,287,673	1,334,519	2,596	0.2%
Total assets		1,478,542	1,449,126	1,455,340	29,416	2.0%
Regulatory deferral account		2,445	2,637	2,620	(192)	(7.3%)
Total assets and regulatory deferral account		\$ 1,480,987	\$ 1,451,763	\$ 1,457,960	\$ 29,224	2.0%

Notes related to Table 1:

- A) *Cash and cash equivalents* consist of cash on hand and balances held within financial institutions reduced by outstanding cheques. They have increased \$12.1 million from the prior year due to new debt of \$20 million in May 2021, reduced by repayments of \$20.6 million, net receipts of regional development charges of \$22.0 million, and spend on capital.
- B) *Customer charges and contractual receivables* have increased \$3.6 million from the prior year. The change in receivables is driven by the timing of billing cycles, up \$2.9 million from prior year, and an accrual for funding on the Caledonia Road transmission project of \$1.0 million, and the decrease in the allowance for doubtful accounts.

Customer charges and contractual					
	2022	2021			
	'000	'000	\$ Change	% Change	
Trade receivables	\$ 19,213	\$ 16,914	\$ 2,299	13.6%	
Other receivables	3,405	2,297	1,108	48.2%	
Allowance for doubtful accounts	(3,614)	(3,758)	144	(3.8%)	
	\$ 19,004	\$ 15,453	\$ 3,551	23.0%	

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Aging of Trade Receivables (in thousands)					
	Current	31 to 60	61 to 120	120+	Grand Total
2022	11,592	1,725	900	4,996	19,213
2021	7,595	1,367	1,359	6,593	16,914
\$ Change	3,997	358	(459)	(1,597)	2,299
% Change	52.6%	26.2%	(33.8%)	(24.2%)	13.6%
Number of customers with receivables in each category*					
2022	39,628	7,079	5,683	10,786	63,176
2021	27,528	6,299	6,446	14,832	55,105
Change	12,100	780	(763)	(4,046)	8,071

* Customers may have receivable balances in multiple aging categories.

- C) *Unbilled service revenues* have decreased \$1.6 million due to the timing of billing cycles and the annual invoicing of customer who only receive stormwater services.
- D) *Halifax Regional Municipality (HRM) receivable* has decreased from the prior year by \$0.8 million and is in a payable balance this month. This relates to receipt of payment for holdbacks related to the Fall River Water servicing project, Lucasville Road and Wanda Lane cost sharing invoices offset by an increase in amounts accrued for the annual dividend/grant in lieu of taxes owing to HRM. The increase in the Regional Development Charge (RDC) is related to an increase of \$0.8 million in deferrals for charges greater than \$0.1 million and an increase in the monthly balance receivable of \$1.5 million due to more collections which is dependent on development activity.

HRM Receivables and Payables					
	2022	2021			
	'000	'000	\$ Change	% Change	
Receivables	\$ 480	\$ 3,030	\$ (2,550)	(84.2%)	
RDC	4,530	2,200	2,330	105.9%	
Payables	(7,194)	(8,216)	1,022	(12.4%)	
	\$ (2,184)	\$ (2,986)	\$ 802	(26.9%)	

- E) The increase in *prepaids* of \$1.2 million is a result of the annual insurance premiums invoice, which in previous years was invoiced monthly, and new software licenses including the new payroll system. Also contributing to the increase were annual invoices for Microsoft and SAP licenses.
- F) The \$11.5 million increase in *capital work in progress* relates to expenditures during the year of \$43.4 million (\$51.2 million in prior year for the eleven months ended February 28, 2021). The top five projects remaining in capital work in progress at February 28, 2022 are detailed below:

Capital Work in Progress	
	Cumulative '000
Bedford South Reservoir	\$ 5,726
ERP Replacement Project	4,341
Wastewater System Trenchless Rehabilitation	2,862
Romans and Federal Avenues Sewer Separation	2,588
Ellenvale Run Retaining Wall Phase 5	1,749
	17,266
<u>All other projects:</u>	
Water	24,400
Wastewater	28,960
Stormwater	6,182
	59,542
Capital work in progress	\$ 76,808

G) *Utility plant in service* assets total \$1.3 billion, an increase of \$2.6 million from the prior year. The increase is a result of additions at year end of \$52.6 million offset by net disposals and adjustments of \$2.0 million, less depreciation expense of \$48.0 million.

Table 2: Liabilities and Equity

February 28 (in thousands)	Notes	2022	2021	March 31 2021	From Prior Year \$ Change	% Change
Liabilities						
Current						
Payables and accruals						
Trade	A	11,111	11,460	12,644	(349)	(3.0%)
Non-trade		4,755	4,561	6,192	194	4.3%
Interest on long term debt		1,961	2,122	2,065	(161)	(7.6%)
Halifax Regional Municipality	B	2,184	2,986	0	(802)	(26.9%)
Contractor and customer deposits		2,389	2,312	2,115	77	3.3%
Current portion of long term debt	C	48,908	20,559	20,559	28,349	137.9%
Unearned revenue		1,036	1,087	561	(51)	(4.7%)
		72,344	45,087	44,136	27,257	60.5%
Long term debt	D	175,256	204,089	204,106	(28,833)	(14.1%)
Deferred contributions	E	72,642	55,184	55,699	17,458	31.6%
Total liabilities		320,242	304,360	303,941	15,882	5.2%
Equity						
Accumulated capital surplus		1,114,640	1,099,861	1,105,918	14,779	1.3%
Accumulated operating surplus		35,706	41,002	46,289	(5,296)	(12.9%)
Operating surplus used to fund capital		12,380	12,380	12,380	0	0.0%
Deficiency of revenues over expenditures		(1,981)	(5,840)	(10,568)	3,859	(66.1%)
Total equity		1,160,745	1,147,403	1,154,019	13,342	1.2%
Total liabilities and equity		\$ 1,480,987	\$ 1,451,763	\$ 1,457,960	\$ 29,224	2.0%

Notes related to Table 2:

- A) *Trade payables and accruals* have decreased \$0.3 million from the prior year. Trade payables have increased \$0.5 million due to holdbacks for capital projects of \$1.2 million and invoicing for accrued payables resulting in a decrease of \$0.8 million in accruals.

Payables and Accruals					
	2022	2021			
	'000	'000	\$ Change	% Change	
Trade payable	\$ 6,710	\$ 6,213	\$ 497	8.0%	
Trade accrued payables	3,182	3,979	(797)	(20.0%)	
Accrued wastewater rebate	1,219	1,268	(49)	(3.9%)	
	\$ 11,111	\$ 11,460	\$ (349)	(3.0%)	

Aging of Accounts Payable (in thousands)					
	Current	31 to 60	61 to 120	120+	Grand Total
2022	4,884	408	534	884	6,710
2021	5,358	229	492	134	6,213
\$ Change	(474)	179	42	750	497
% Change	(8.8%)	78.2%	8.5%	559.7%	8.0%

Please see Attachment 2, Vendor Spend Report to February 28, 2022, for spend by vendor year to date, the top five are listed below:

Top Vendor Payments	
	Cumulative YTD
	'000
Halifax Regional Municipality	\$ 15,301
NS Power Inc.	7,676
The Northern Trust Company	6,190
Brycon Construction Ltd.	4,037
Dexter Construction Company	3,539
	36,743
All other vendors:	82,180
Total vendor payments	\$ 118,923

- B) *Halifax Regional Municipality (HRM) payable* has decreased from the prior year by \$0.8 million. See explanation under the Notes related to Table 1, letter D.
- C) *Current portion of long term debt* has increased \$28.3 million due to balloon payments required for debt in May and November 2022 expected to be refinanced.
- D) *Long term debt* has decreased \$28.8 million as \$27.3 million has been reallocated to current. New debt of \$20.0 million was issued in May 2021. Long term debt repayments have been \$20.6 million.

Debt servicing ratio is a function of total interest and principal payments (including accrued amounts) plus the amortization of debt issue costs divided by total operating revenue per service. Debt servicing ratio by service as at February 28, 2022 is as follows:

Debt Servicing Ratio by Service		
	2021/22	2020/21
Water	13.77%	13.12%
Wastewater	21.70%	25.00%
Stormwater	26.74%	24.95%
Combined	19.00%	20.11%

The debt servicing ratio for each service, except wastewater, has increased from the prior year as a result of the issuance of new debt. The wastewater debt servicing ratio has decreased from the prior year due to higher revenues than the prior year as a result of an increase to the wastewater discharge rate.

The combined debt servicing ratio of 19.00% is below the maximum 35.00% ratio allowed under the blanket guarantee agreement with HRM.

Statement of Earnings (NSUARB)

Table 3: Summarized Statement of Earnings (NSUARB)

Summarized Statement of Earnings									
Notes	Budget	Forecast	YTD Actual	PYTD Actual	From Prior Year		Budget to Forecast		
	2021/22	2021/22	2021/22	2020/21	\$ Change	% Change	\$ Change	% Change	
	'000	'000	'000	'000					
Operating revenues	\$ 150,467	\$ 151,787	\$ 137,963	\$ 126,086	\$ 11,877	9.42%	\$ 1,320	0.87%	
Operating expenditures	125,379	121,637	108,163	101,817	6,346	6.23%	(3,742)	(2.98%)	
Earnings from operations before financial and other revenues and expenditures	25,088	30,150	29,800	24,269	5,531	22.79%	5,062	20.18%	
Financial and other revenues	722	783	690	716	(26)	(3.63%)	61	8.45%	
Financial and other expenditures	37,460	35,396	32,471	30,825	1,646	5.34%	(2,064)	(5.51%)	
Loss for the year	A \$ (11,650)	\$ (4,463)	\$ (1,981)	\$ (5,840)	\$ 3,859	(66.08%)	\$ 7,187	(61.69%)	

Notes related to Table 3:

- A) The *loss* for the year to date is \$2.0 million, a decrease of \$3.9 million over the prior year loss. The following is a discussion of factors influencing the change.

Table 4: Operating Revenues:

Operating Revenues									
	Notes	Budget 2021/22 '000	Forecast 2021/22 '000	YTD 2021/22 '000	PYTD 2020/21 '000	From Prior Year		Budget to Forecast	
						\$ Change	% Change	\$ Change	% Change
Consumption revenue	B	\$ 96,530	\$ 96,836	\$ 88,403	\$ 77,772	\$ 10,631	13.67%	\$ 306	0.32%
Base charge revenue		34,004	34,180	30,711	30,738	(27)	(0.09%)	176	0.52%
Wastewater rebate	C	(1,493)	(1,113)	(1,054)	(835)	(219)	26.23%	380	(25.45%)
Metered sales total		129,041	129,903	118,060	107,675	10,385	9.64%	862	0.67%
Stormwater site generated charge	D	6,051	6,537	5,858	5,565	293	5.27%	486	8.03%
Stormwater right of way		3,835	3,835	3,515	3,515	-	0.00%	-	0.00%
Public fire protection	E	7,628	7,628	6,992	6,694	298	4.45%	-	0.00%
Private fire protection	E	1,312	1,335	1,157	816	341	41.79%	23	1.75%
Other operating revenue	F	2,600	2,549	2,381	1,821	560	30.75%	(51)	(1.96%)
Operating revenue total	A	\$ 150,467	\$ 151,787	\$ 137,963	\$ 126,086	\$ 11,877	9.42%	\$ 1,320	0.88%

Notes related to Table 4:

Operating revenues are presented below, broken down by type:

- A) *Operating revenues* have increased \$11.9 million as compared to the previous year.
- B) *Consumption* has increased 0.4% on a volumetric basis compared to the prior year. The other factor influencing the increase in *consumption revenue* of \$10.6 million over the prior year is the rate increase for wastewater discharge effective April 1, 2021 from \$1.753 per cubic meter to \$2.073 per cubic meter.

Consumption by Customer Class (m3)				
	2021/22	2020/21	m3 Change	% Change
Commercial	5,497,937	5,263,101	234,835	4.5%
Industrial	1,833,324	1,709,042	124,282	7.3%
Institutional	3,513,258	3,168,667	344,591	10.9%
Multi-residential	7,067,422	6,742,196	325,226	4.8%
Residential	11,834,237	12,735,683	(901,446)	(7.1%)
	29,746,177	29,618,688	127,489	0.4%

- C) *Wastewater rebate* is \$0.2 million more than prior year due to new customers in the current year. The forecast has decreased \$0.4 million compared to budget as annual requests have been processed for lesser volumes of wastewater discharged into our system due to the customers operational requirements.
- D) *Stormwater site generated charge revenue* is \$0.3 million more than the prior year due to the impervious area satellite imagery update. It has been forecast to be \$0.5 million more than budget due to the update.
- E) *Public and private fire protection revenues* have increased by a combined \$0.6 million from the prior year due to an approved rate increase effective October 1, 2020.

- F) *Other operating revenue* has increased \$0.6 million over the prior year due to late payment and interest charges being waived in the prior year as a COVID-19 relief measure, the introduction of a new meter reading charge to recoup the cost of manual meter reads for non-AMI meters effective October 1, 2020, and an increase in drawing review fees which are dependent upon the level of development activity.

Table 5: Operating expenditures:

Operating Expenditures										
	Notes	Budget 2021/22 '000	Forecast 2021/22 '000	YTD 2021/22 '000	PYTD 2020/21 '000	From Prior Year		Budget to Forecast		
						\$ Change	% Change	\$ Change	% Change	
Water supply and treatment	B	\$ 10,778	\$ 10,575	\$ 9,894	\$ 9,100	\$ 794	8.73%	\$ (203)	(1.88%)	
Water transmission and distribution	C	11,876	11,778	10,103	10,546	(443)	(4.20%)	(98)	(0.83%)	
Wastewater collection	D	12,604	12,348	13,326	12,962	364	2.81%	(256)	(2.03%)	
Stormwater collection	E	5,885	5,037	3,997	4,434	(437)	(9.86%)	(848)	(14.41%)	
Wastewater treatment	F	22,071	21,378	19,523	18,623	900	4.83%	(693)	(3.14%)	
Engineering and technology services	G	12,931	13,421	10,014	8,337	1,677	20.12%	490	3.79%	
Regulatory services	H	4,472	4,312	3,991	3,582	409	11.42%	(160)	(3.58%)	
Customer services	I	5,837	4,996	4,512	4,460	52	1.17%	(841)	(14.41%)	
Corporate services	J	3,124	3,156	2,668	178	2,490	1398.88%	32	1.02%	
Administration services	J	4,928	4,725	3,596	4,996	(1,400)	(28.02%)	(203)	(4.12%)	
Depreciation and amortization	K	30,873	29,911	26,539	24,599	1,940	7.89%	(962)	(3.12%)	
Total operating expenditures	A	\$ 125,379	\$ 121,637	\$ 108,163	\$ 101,817	\$ 6,346	6.23%	\$ (3,742)	(2.98%)	

Notes related to Table 5:

- A) *Operating expenditures* of \$108.2 million are \$6.3 million higher than the prior year.
- B) *Water supply and treatment* has increased \$0.8 million from prior year due to increases in salaries and benefits (\$221k) relating to new positions and wage rate increases, and an increase in treatment chemicals (\$289k), mostly alum and phosphates relating to the increased dosage for the Lake Major clarifier project. Lead service line replacement costs also increased (\$300k) due to the new program to pay for the private portion of service line replacements in the current year. Costs relating to the JD Kline lagoon cleaning were (\$65k) more than the prior year, offset by a decrease in equipment repairs (\$134k) relating to a pump failure in prior year. Water supply and treatment forecast has decreased \$0.2 million due in part to reallocation of public portion of the lead service line replacement costs to capital.
- C) *Water transmission and distribution* has decreased \$0.4 million from the prior year. Salaries and benefits have decreased (\$259k) offset by increases in traffic control costs (\$152k) due to an increase in activity over the prior year resulting from COVID-19 delays. Other categories with cost increases include road and street repairs (\$145k) relating to several significant watermain breaks in the current year, offset by a decrease in personal protective equipment (\$89k) and fleet cost allocations (\$256k).
- D) *Wastewater collection* has increased \$0.4 million from prior year due to increases in salaries and benefits (\$70k) based on the allocation of time between wastewater and stormwater services, increase in vehicle cost allocation (\$382k) which is dependent upon usage, and an increase in traffic control costs (\$75k) due to an increase in activity as compared to the prior year. Prior year was lower as a result of COVID-19 delays. The increases have been offset by decreases in personal protective equipment (\$52k) and materials and supplies purchases (\$153k). Wastewater collection is forecast to decrease \$0.3 million due mainly to vacancies

during the year, particularly in the West region, which also resulted in lower costs associated with materials and supplies.

- E) *Stormwater collection* has decreased \$0.4 million from prior year due to decreases in salaries and benefits (\$202k) partially due to the allocation of time between wastewater and stormwater services, and a decrease in contract services (\$150k) relating mainly to emergency repairs for the Pier A combined sewer overflow (CSO) in the prior year. Stormwater collection is forecasted to decrease \$0.8 million based on reduced costs being experienced in expenditure categories such as contract services and traffic control, and associated reduction in wages and overtime.
- F) *Wastewater treatment* has increased \$0.9 million from prior year due to increases in salaries and benefits (\$385k) relating to new positions and wage rate increases, and increases in chemicals (\$395k), mostly polymer due to price increases and sodium hypochlorite due to a dry summer requiring more use of the chemical to reduce odors. There were also increases in consulting costs (\$106k) for a Dalhousie research project due to reduced activity in prior year due to COVID-19, and an increase in biosolids treatment and trucking costs (\$200k) due in part to higher volumes being processed. The cost increases are offset by a decrease in tools and equipment purchases mainly relating to UV light purchases in the prior year. Wastewater treatment is forecasted to decrease \$0.7 million partially due to lower flows being experienced at the treatment plants, resulting in lower treatment costs and usage costs for chemicals such as alum. Additionally, the treatment train was down at the Halifax wastewater treatment facility longer than expected, resulting in lower biosolid treatment cost.
- G) *Engineering and technology services* have increased \$1.7 million from prior year due to increases in salaries and benefits (\$345k) relating to new positions and wage rate increases along with training costs (\$41k) due to the availability of courses. Other increases include website hosting (\$60k), new Microsoft Azure licenses (\$267k) which have been included in the revised forecast, software licenses for the new VIP payroll system (\$213k), and customer portal (\$155k). Engineering and technology services are forecasted to increase \$0.5 million due to the need for Microsoft Azure licenses, a higher subscription rate by customers for the customer portal than budgeted, and a net new hire in the information services department.
- H) *Regulatory Services* have increased \$0.4 million mainly due to increases in salaries and benefits (\$368k) relating to wage rate increases and new staff. Expenditures have been forecast \$0.2 million lower due to lower than expected consulting costs, and a reduction in training and development costs. As well, there has been a reallocation of legal services forecast to other departments.
- I) *Customer services* have decreased \$0.1 million from the prior year due to decreases in salaries and benefits (\$20k) relating to vacant positions and a decrease in the bad debt expense (\$43k) due to anticipated collection activities. Customer services are forecasted to decrease by \$0.8 million. This is attributed to deferring implementation of the monthly customer billing project resulting in savings of approximately \$0.7 million as well as cost savings of \$0.1 million relating to salaries due to vacant positions. The decrease has been offset by an increase in subscription costs, which are forecasted to increase \$0.1 million and not previously budgeted.
- J) *Corporate services and administration services* have increased \$1.1 million from the prior year mainly due to increases in salaries and benefits (\$628k) relating to new positions, wage rate increases, and salary adjustments for non-union compensation. Other increases include higher participation in the fitness incentive and employee assistance programs (\$83k) and an

increase in insurance policy premiums (\$257k). Corporate services are forecasted to remain the same with offsetting changes between departments. Administration services are forecast to decrease \$0.2 million due to awards banquet cancellation, fewer arbitrations, and low number of investigations, as well as a decrease in consulting costs for rate and utility consulting.

- K) *Depreciation and amortization* have increased \$1.9 million as a result of additions to utility plant in service and intangibles. Depreciation and amortization are forecasted to be less than budget by \$3.5 million due to fewer additions in prior and current year than budgeted.

Table 6: Operating Expenditures by Nature:

Operating Expenditures by Nature					
	Notes	2021/22 '000	2020/21 '000	\$ Change	% Change
Salaries and benefits	A	\$ 38,655	\$ 36,954	\$ 1,701	4.40%
Training		381	283	98	25.78%
Contract services	B	12,323	11,490	833	6.76%
Electricity		6,301	6,245	56	0.89%
Operating supplies	C	11,535	10,619	916	7.94%
Professional services	D	5,013	4,723	290	5.78%
Chemicals	E	6,166	5,483	683	11.07%
Depreciation on assets allocated to departments	F	1,250	1,421	(171)	(13.68%)
Depreciation and amortization	F	26,539	24,599	1,940	7.31%
		\$ 108,163	\$ 101,817	\$ 6,346	5.87%

Notes related to Table 6:

Operating expenditures of \$108.2 million are \$6.3 million higher than the prior year.

Compared to the prior year, expenditure types with the largest changes in costs are:

- A) Salaries and benefits increase of \$1.7 million is due to wage rate increases and new positions, offset by several retirements.
- B) Contract services increase of \$0.8 million is due to an increase in traffic control services and hired equipment relating to an increase in activity post COVID-19 along with an increase in biosolids treatment due to higher volume being sent for processing at a third-party facility.
- C) Operating supplies increase of \$0.9 million is due mainly to engineering and technology services cost increases relating to software licenses, network costs, and equipment purchases.
- D) Professional services increase of \$0.3 million is due mainly to insurance policy premiums.
- E) Chemicals increase of \$0.7 million is due mainly to price increases and greater usage of certain chemicals.
- F) Depreciation increase of \$1.8 million is due to additions to utility plant in service.

ITEM # 4.1
Halifax Water Board
March 24, 2022

Table 7: Operating Results by Service:

Operating Results by Service								
	Budget 2021/22 '000	Forecast 2021/22 '000	YTD 2021/22 '000	PYTD 2020/21 '000	From Prior Year		Budget to Forecast	
					\$ Change	% Change	\$ Change	% Change
Water	\$ (5,221)	\$ (2,370)	\$ (507)	\$ 1,979	\$ (2,486)	(125.62%)	\$ 2,851	(54.61%)
Wastewater	(1,517)	1,487	384	(5,896)	6,280	(106.51%)	3,004	(198.02%)
Stormwater	(4,912)	(3,580)	(1,858)	(1,923)	65	(3.38%)	1,332	(27.12%)
Loss	\$ (11,650)	\$ (4,463)	\$ (1,981)	\$ (5,840)	\$ 3,859	(66.08%)	\$ 7,187	(61.69%)

The results in Table 7 are explained in more detail in Tables 8 to 10.

Table 8: Operating Results by Service – Water:

Operating Results by Service - Water									
	Notes	Budget 2021/22 '000	Forecast 2021/22 '000	YTD 2021/22 '000	PYTD 2020/21 '000	From Prior Year		Budget to Forecast	
						\$ Change	% Change	\$ Change	% Change
Operating revenues	A	\$ 58,213	\$ 58,556	\$ 53,146	\$ 51,840	\$ 1,306	2.52%	\$ 343	0.59%
Operating expenditures	B	48,638	47,607	41,468	38,504	2,964	7.70%	(1,031)	(2.12%)
Earnings from operations		9,575	10,949	11,678	13,336	(1,658)	(12.43%)	1,374	14.35%
Financial and other revenues		495	578	545	508	37	7.28%	83	16.77%
Financial and other expenditures	C	15,291	13,897	12,730	11,865	865	7.29%	(1,394)	(9.12%)
(Loss) earnings for the year		\$ (5,221)	\$ (2,370)	\$ (507)	\$ 1,979	(2,486)	(125.62%)	2,851	(54.61%)

Water services loss has decreased from the prior year earnings by \$2.5 million due to the following factors:

- A) *Operating revenues* increase of \$1.3 million is attributable to the following:
 - i. Increase in base charges and consumption as a result of new customers.
 - ii. Increase in fire protection revenues of \$0.6 million as a result of a rate increase effective October 1, 2020.
 - iii. Increase in late payment fees of \$0.1 million as prior year fees were waived for part of the year as a result of COVID-19 relief measures.
 - iv. Increase in miscellaneous revenues of \$0.1 million mainly due to new meter reading fee allocated between water and wastewater services.
- B) Increase in *operating expenditures* of \$3.0 million as discussed previously including increases in salaries and benefits increases and depreciation.
- C) Increase in *financial and other expenditures* of \$0.9 million due to higher debt servicing costs and the dividend/grant in lieu of taxes.

Table 9: Operating Results by Service – Wastewater:

Operating Results by Service - Wastewater									
	Notes	Budget 2021/22 '000	Forecast 2021/22 '000	YTD 2021/22 '000	PYTD 2020/21 '000	From Prior Year		Budget to Forecast	
						\$ Change	% Change	\$ Change	% Change
Operating revenues	A	\$ 82,167	\$ 82,682	\$ 75,202	\$ 65,065	\$ 10,137	15.58%	\$ 515	0.63%
Operating expenditures	B	64,837	62,747	57,901	54,524	3,377	6.19%	(2,090)	(3.22%)
Earnings (loss) from operations		17,330	19,935	17,301	10,541	6,760	64.13%	2,605	15.03%
Financial and other revenues		196	187	128	176	(48)	(27.27%)	(9)	(4.59%)
Financial and other expenditures	C	19,043	18,635	17,045	16,613	432	2.60%	(408)	(2.14%)
Earnings (loss) for the year		\$ (1,517)	\$ 1,487	\$ 384	\$ (5,896)	6,280	(106.51%)	3,004	(198.02%)

Wastewater services earnings of \$0.4 million have increased from the prior year loss by \$6.3 million due to the following factors:

- A) *Operating revenues* increase of \$10.1 million is attributable to the following:
 - i. Increase in the wastewater discharge rate from \$1.753 to \$2.073 effective April 1, 2021.
 - ii. Increase in late payment fees of \$80k as prior year fees were waived for part of the year as a result of COVID-19 relief measures.
 - iii. Increase in miscellaneous revenues of \$70k mainly due to new meter reading fee allocated between water and wastewater services.
- B) Increase in *operating expenditures* of \$3.4 million as discussed previously including increases in salaries and benefits increases and depreciation.
- C) Increase in *financial and other expenditures* of \$0.4 million due to higher debt servicing costs and the first full year for the new dividend/grant in lieu of taxes on wastewater assets which became effective October 1, 2020.

Table 10: Operating Results by Service – Stormwater:

Operating Results by Service - Stormwater									
	Notes	Budget 2021/22 '000	Forecast 2021/22 '000	YTD 2021/22 '000	PYTD 2020/21 '000	From Prior Year		Budget to Forecast	
						\$ Change	% Change	\$ Change	% Change
Operating revenues	A	\$ 10,087	\$ 10,549	\$ 9,615	\$ 9,181	\$ 434	4.73%	\$ 462	4.58%
Operating expenditures	B	11,904	11,283	8,794	8,789	5	0.06%	(621)	(5.22%)
Earnings (loss) from operations		(1,817)	(734)	821	392	429	109.44%	1,083	(59.60%)
Financial and other revenues		31	18	17	32	(15)	(46.88%)	(13)	(41.94%)
Financial and other expenditures	C	3,126	2,864	2,696	2,347	349	14.87%	(262)	(8.38%)
Loss for the year		\$ (4,912)	\$ (3,580)	\$ (1,858)	\$ (1,923)	65	(3.38%)	1,332	(27.12%)

Stormwater services loss of \$1.9 million is comparable to prior year. The following factors influenced the results:

- A) Increase of \$0.3 million in site generated revenue due to satellite imagery update and an increase in late payment fees of \$0.1 million as prior year fees were waived for part of the year as a result of COVID-19 relief measures.
- B) Minimal change in *operating expenditures* with an increase in depreciation offset by decreases in salaries and benefits as resources are allocated between wastewater and stormwater collection.
- C) Increase in *financial and other expenditures* of \$0.3 million due to higher debt servicing costs and the first full year for the new dividend/grant in lieu of taxes on stormwater assets which became effective October 1, 2020.

Table 11: Financial and other revenues:

Financial and other revenues									
	Notes	Budget 2021/22 '000	Forecast 2021/22 '000	YTD 2021/22 '000	PYTD 2020/21 '000	From Prior Year		Budget to Forecast	
						\$ Change	% Change	\$ Change	% Change
Interest	A	\$ 173	\$ 163	\$ 160	\$ 202	\$ (42)	(20.79%)	\$ (10)	(6.13%)
Other	B	549	620	530	514	16	3.11%	71	12.93%
Total financial and other revenue		\$ 722	\$ 783	\$ 690	\$ 716	\$ (26)	(3.63%)	\$ 61	8.45%

Notes related to Table 11:

- A) *Interest* is lower than the prior year due to a decrease in interest rates.
- B) *Other revenues* include various un-regulated activities such as tower lease revenues, energy generation revenues, consulting activities and contracted service revenues. The increase in the forecast is mainly related to new source of revenue for the sale of wood.

Table 12: Financial and other expenditures:

Financial and other expenditures									
	Notes	Budget 2021/22 '000	Forecast 2021/22 '000	YTD 2021/22 '000	PYTD 2020/21 '000	From Prior Year		Budget to Forecast	
						\$ Change	% Change	\$ Change	% Change
Interest on long term debt	B	\$ 7,603	\$ 6,822	\$ 6,353	\$ 6,527	\$ (174)	(2.67%)	\$ (781)	(11.45%)
Repayment on long term debt	B	22,716	21,559	19,646	18,634	1,012	5.43%	(1,157)	(5.09%)
Amortization of debt discount	B	258	229	209	195	14	7.18%	(29)	(11.24%)
Dividend/grant in lieu of taxes	C	6,837	6,626	6,074	5,417	657	12.13%	(211)	(3.09%)
Other		46	160	189	52	137	263.46%	114	247.83%
Total financial and other expenditures	A	\$ 37,460	\$ 35,396	\$ 32,471	\$ 30,825	\$ 1,646	5.34%	\$ (2,064)	(5.51%)

Notes related to Table 12:

- A) *Financial and other expenditures* have increased \$1.6 million over the prior year mainly due to an increase in *long term debt payments* due to the acquisition of new debt and an increase in the *dividend/grant in lieu of taxes* due to additions to utility plant in service and a dividend of 0.25% on wastewater and stormwater rate based assets, effective October 1, 2020.

- B) *Long term debt appropriation expenditures (interest, repayment, and amortization)* are forecast to decrease \$2.0 million due to the budgeted debt issuance for this fiscal year being higher than actual debt acquired.
- C) *Dividend/grant in lieu of taxes* has been forecast to decrease \$0.2 million due to lower capital additions as at March 31, 2021 which drives the basis for the dividend.

Table 13: Debt Servicing by Service:

Debt Servicing by Service					
	Notes	2021/22 '000	2020/21 '000	\$ Change	% Change
Water Services					
Interest on long term debt		\$ 1,934	\$ 1,855	\$ 79	4.3%
Repayment on long term debt		5,311	4,877	434	8.9%
Amortization of debt discount		74	68	6	8.8%
Total debt servicing cost - water services	A	\$ 7,319	\$ 6,800	\$ 519	7.6%
Wastewater Services					
Interest on long term debt		\$ 3,751	\$ 4,045	\$ (294)	(7.3%)
Repayment on long term debt		12,452	12,110	342	2.8%
Amortization of debt discount		115	110	5	4.5%
Total debt servicing cost - wastewater services	B	\$ 16,318	\$ 16,265	\$ 53	0.3%
Stormwater Services					
Interest on long term debt		\$ 668	\$ 627	\$ 41	6.5%
Repayment on long term debt		1,883	1,647	236	14.3%
Amortization of debt discount		20	17	3	17.6%
Total debt servicing cost - stormwater services	C	\$ 2,571	\$ 2,291	\$ 280	12.2%

Notes related to Table 13:

- A) *Water debt servicing costs* of \$7.3 million have increased \$0.5 million from the prior year as a result of \$22.0 million in new debt.
- B) *Wastewater debt servicing costs* of \$16.3 million have increased \$0.1 million from the prior year as a result of \$13.4 million in new debt.
- C) *Stormwater debt servicing costs* of \$2.6 million have increased \$0.3 million from the prior year as a result of \$9.6 million in new debt.

Table 14: Operating Results by Activity:

Operating Results by Activity									
	Notes	Budget 2021/22 '000	Forecast 2021/22 '000	YTD 2021/22 '000	PYTD 2020/21 '000	From Prior Year		Budget to Forecast	
						\$ Change	% Change	\$ Change	% Change
Regulated activities	A	\$ (12,175)	\$ (4,900)	\$ (2,358)	\$ (6,546)	\$ 4,188	(63.98%)	\$ 7,275	(59.75%)
Unregulated activities	B	525	437	377	706	(329)	(46.60%)	(88)	(16.76%)
Loss		\$ (11,650)	\$ (4,463)	\$ (1,981)	\$ (5,840)	\$ 3,859	(66.08%)	\$ 7,187	(61.69%)

Notes related to Table 14:

- A) *Regulated activities* loss has decreased from the prior year loss by \$4.2 million due to the factors as previously explained.
- B) *Unregulated activities* earnings of \$0.4 million have decreased \$0.3 million from the prior year due to an increase in operating costs for the leachate and dewatering facilities and allocation of administrative costs.

Table 15: Corporate Balance Scorecard - Responsible Financial Management:

Corporate Balance Scorecard - Responsible Financial Management		
	Budget 2021/22 '000	Forecast 2021/22 '000
Expense to Revenue Ratio	0.820%	0.788%
*(expenses reduced by \$1.6 million)		
Annual Cost per Connection - Water	\$ 543.00	\$ 537.00
*(target reduced by 3%)		
Annual Cost per Connection - Wastewater	\$ 758.00	\$ 741.00
*(target reduced by 3%)		
1 - Targets calculated based on the 2021/22 Operating Budget.		
2 - Operating expenses reduced by \$1,600,000 to incorporate stretch goals for cost containment incentives.		
3 - Targets reported above exclude pension plan accrual amounts.		
4 - Connection costs are based on the budgeted customer base for March 31, 2021, with an estimated increase for the 2021/22 fiscal year.		
5 - Forecast results to February 28, 2022.		
6 - Customer connections as at March 9, 2022		

Notes related to Table 15:

Halifax Water measures and reports annually specific indicators related to the performance of the utility. Three of the indicators are related to the financial results of the utility, these are the expense to revenue ratio, annual cost per connection for water services, and annual cost per connection for wastewater services. The expense to revenue ratio is one of several gateway indicators which is required to be met in order to qualify for the organizational award.

- A) The budgeted *expense to revenue ratio* for the year was 0.820%. The forecast as of February 28, 2022 is trending less than budget.
- B) The budgeted *annual cost per connection for water services* for the year was \$543.00. The forecast as of February 28, 2022 is trending less than budget.
- C) The budgeted *annual cost per connection for wastewater services* for the year was \$758.00. The forecast as of February 28, 2022 is trending less than budget.

Results under International Financial Reporting Standards (IFRS) as compared to NSUARB Handbook

As a rate regulated utility, the Accounting Standards Board (AcSB) requires Halifax Water, to report financial results using IFRS. The NSUARB requires Halifax Water to report in accordance with the NSUARB Handbook. Table 15 below reconciles the results between IFRS and the NSUARB Handbook:

Table 16: Reconciliation IFRS to NSUARB:

Reconcile IFRS to NSUARB			
	Notes	2021/22 '000	2020/21 '000
IFRS comprehensive earnings		\$ 7,114	\$ 2,085
Add non-cash pension expense	A	9,601	9,354
Subtract debt principal payments	B	(19,646)	(18,634)
Add depreciation expense on contributed assets	C	16,356	17,216
Subtract amortization of contributed capital	C	(16,356)	(17,216)
Add various depreciation adjustments	D	950	1,355
Add (subtract) OCI loss (gain)		-	-
NSUARB Loss		\$ (1,981)	\$ (5,840)

Notes related to Table 16:

Operating revenues are the same under both IFRS and the NSUARB Handbook.

The main differences relate to reporting requirements surrounding the recognition of various expenditures as follows:

- A) *Non-cash pension expense* represents the accrual of unpaid contributions to the pension plan and is not considered an expense for NSUARB Handbook reporting purposes.
- B) The *principal payments* on long term debt are recognized as an expense for NSUARB Handbook reporting purposes but are not an expense under IFRS.
- C) *Depreciation expense on contributed assets* is not an expense for NSUARB Handbook purposes, however, it is offset by the removal of the amortization of contributed capital. IFRS requires *contributed capital* to be treated as a long term liability and amortized, resulting in higher long term liabilities and lower equity on the statement of financial position.
- D) The *various depreciation adjustments* include the add back of gains on the disposal of utility plant in service and IFRS requires componentization of assets and shorter useful lives resulting in higher depreciation than under NSUARB Handbook reporting.

Table 17: Statement of Earnings and Comprehensive Earnings (IFRS):

Summarized Comprehensive Earnings					
	Notes	2021/22 '000	2020/21 '000	\$ Change	% Change
Operating revenues	A	\$ 137,963	\$ 126,086	\$ 11,877	9.4%
Operating expenditures	B	135,800	129,877	5,923	4.6%
Earnings (loss) from operations before financial and other revenues and expenditures		2,163	(3,791)	5,954	(157.1%)
Financial and other revenues	C	17,684	17,932	(248)	(1.4%)
Financial and other expenditures	D	12,541	11,864	677	5.7%
Total comprehensive earnings for the year		\$ 7,114	\$ 2,085	\$ 5,029	241.2%

Notes related to Table 17:

Key indicators and balances from the Statement of Earnings and Comprehensive Earnings are as follows:

- A) *Operating revenues* of \$138.0 million are \$11.9 million higher than the prior year. Details have been discussed in preceding pages.
- B) *Operating expenditures* of \$135.8 million are \$5.9 million higher than the prior year. This is primarily the result of the following factors:
 - a. Increase in depreciation and amortization expense of \$1.3 million as a result of additions to utility plant in service.
 - b. Increase in accrued pension expense of \$0.2 million as a result of the actuarial extrapolation at year end, resulting in a higher estimate for this current fiscal year.
- C) *Financial and other revenues* have decreased \$0.2 million from the prior year relating to lower amortization of contributed capital.
- D) *Financial and other expenditures* have increased \$0.7 million from the prior year. This is a result of the dividend/grant in lieu of taxes on wastewater and stormwater assets.

Attachments

Attachment 1: Operating Results for February 28, 2022

Attachment 2: Vendor Spend Report to February 28, 2022

Report prepared by:

**Alicia
Scallion**

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HALIFAX WATER
UNAUDITED STATEMENT OF FINANCIAL POSITION - IFRS
FEBRUARY 28, 2022 (in thousands)

February 28 (in thousands)	2022	2021	March 31 2021	From Prior Year \$ Change	% Change
Assets					
Current					
Cash and cash equivalents	\$ 70,686	\$ 58,565	\$ 48,228	\$ 12,121	20.7%
Receivables					
Customers charges and contractual	19,004	15,453	17,155	3,551	23.0%
Unbilled service revenues	17,636	19,234	18,246	(1,598)	(8.3%)
Halifax Regional Municipality	0	0	2,711	0	0.0%
Inventory	2,204	2,120	2,003	84	4.0%
Prepays	1,935	724	1,570	1,211	167.3%
	<u>111,465</u>	<u>96,096</u>	<u>89,913</u>	<u>15,369</u>	<u>16.0%</u>
Intangible assets					
Capital work in progress	18,651	17,334	20,588	1,317	7.6%
Utility plant in service	76,808	65,357	30,908	11,451	17.5%
Total assets	<u>1,235,815</u>	<u>1,238,850</u>	<u>1,280,283</u>	<u>(3,035)</u>	<u>(0.2%)</u>
	<u>1,442,739</u>	<u>1,417,637</u>	<u>1,421,692</u>	<u>25,102</u>	<u>1.8%</u>
Regulatory deferral account	2,445	2,637	2,620	(192)	(7.3%)
Total assets and regulatory deferral account	\$ 1,445,184	\$ 1,420,274	\$ 1,424,312	\$ 24,910	1.8%
Liabilities					
Current					
Payables and accruals					
Trade	11,111	11,460	12,644	(349)	(3.0%)
Non-trade	4,755	4,561	6,192	194	4.3%
Interest on long term debt	1,961	2,122	2,065	(161)	(7.6%)
Halifax Regional Municipality	2,184	2,986	0	(802)	(26.9%)
Contractor and customer deposits	2,389	2,312	2,115	77	3.3%
Current portion of deferred contributed capital	14,580	14,488	14,580	92	0.6%
Current portion of long term debt	48,908	20,559	20,559	28,349	137.9%
Unearned revenue	1,036	1,087	561	(51)	(4.7%)
	<u>86,924</u>	<u>59,575</u>	<u>58,716</u>	<u>27,349</u>	<u>45.9%</u>
Deferred contributed capital	888,902	877,305	883,916	11,597	1.3%
Long term debt	175,256	204,089	204,106	(28,833)	(14.1%)
Employee benefit obligation	83,394	72,705	73,796	10,689	14.7%
Total liabilities	<u>1,234,476</u>	<u>1,213,674</u>	<u>1,220,534</u>	<u>20,802</u>	<u>1.7%</u>
Equity					
Accumulated other comprehensive loss	(29,682)	(26,452)	(29,682)	(3,230)	12.2%
Accumulated surplus	240,390	233,052	233,460	7,338	3.1%
Total equity	<u>210,708</u>	<u>206,600</u>	<u>203,778</u>	<u>4,108</u>	<u>2.0%</u>
Total liabilities and equity	\$ 1,445,184	\$ 1,420,274	\$ 1,424,312	\$ 24,910	1.8%

HALIFAX WATER
UNAUDITED STATEMENT OF EARNINGS AND COMPREHENSIVE EARNINGS - ALL SERVICES - IFRS
APRIL 1, 2021 - FEBRUARY 28, 2022 (11 MONTHS)
ACTUAL YEAR TO DATE COMPLETE: 91.67%

	ACTUAL		APR 1/21		APR 1/21		APR 1/21		ACTUAL	
	YEAR TO DATE		MAR 31/22		BUDGET		FORECAST		YEAR TO DATE	
	THIS YEAR	LAST YEAR	'000		'000		'000		as % of	BUDGET
	'000	'000								
Operating revenues										
Water	\$ 44,123	\$ 43,717	\$	48,423	\$	48,654			\$	406
Wastewater	73,937	63,958		80,618		81,249			9,979	0.93%
Stormwater	9,373	9,080		9,886		10,372			293	15.60%
Public fire protection	6,992	6,694		7,628		7,628			298	3.23%
Private fire protection	1,157	816		1,312		1,335			298	4.45%
Other operating revenue	2,381	1,821		2,600		2,549			341	41.79%
	137,963	126,086	150,467	151,787					560	30.75%
									11,877	9.42%
Operating expenditures										
Water supply and treatment	9,894	9,100		10,778		10,575			794	8.73%
Water transmission and distribution	10,103	10,546		11,876		11,778			(443)	(4.20%)
Wastewater collection	13,326	12,962		12,604		12,348			364	2.81%
Stormwater collection	3,997	4,434		5,885		5,037			(437)	(9.86%)
Wastewater treatment	19,523	18,623		22,071		21,378			900	4.83%
Engineering and technology services	10,014	8,337		12,931		13,421			1,677	20.12%
Regulatory services	3,991	3,582		4,472		4,312			409	11.42%
Customer services	4,512	4,460		5,837		4,996			52	1.17%
Corporate services	2,668	178		3,124		3,156			2,490	1398.88%
Administration services	3,596	4,996		4,928		4,725			(1,400)	(28.02%)
Pension services	9,601	9,354		0		8,837			247	2.64%
Depreciation and amortization	44,767	43,497		44,837		43,875			1,270	2.92%
	135,992	130,069	139,343	144,438					5,923	4.55%
Earnings (loss) from operations before financial and other revenues and expenditures	1,971	(3,983)	11,124	7,349					5,954	(149.49%)
Financial and other revenues										
Interest	160	202		173		163			(42)	(20.79%)
Amortization of contributed capital	16,994	17,216		13,964		13,964			(222)	(1.29%)
Other	530	514		549		620			16	3.11%
	17,684	17,932	14,686	14,747					(248)	(1.38%)
Financial and other expenditures										
Interest on long term debt	6,353	6,527		7,603		6,822			(174)	(2.67%)
Amortization of debt discount	209	195		258		229			14	7.18%
Dividend/grant in lieu of taxes	6,074	5,417		6,837		6,626			657	12.13%
Other	(95)	(275)		46		160			180	(65.45%)
	12,541	11,864	14,744	13,837					677	5.71%
Total comprehensive earnings for the year	\$ 7,114	\$ 2,085	\$ 11,066	\$ 8,259					\$ 5,029	241.20%

HALIFAX WATER
UNAUDITED STATEMENT OF FINANCIAL POSITION - NSUARB
FEBRUARY 28, 2022 (in thousands)

February 28 (in thousands)	2022	2021	March 31 2021	From Prior Year \$ Change	% Change
Assets					
Current					
Cash and cash equivalents	\$ 70,686	\$ 58,565	\$ 48,228	\$ 12,121	20.7%
Receivables					
Customer charges and contractual	19,004	15,453	17,155	3,551	23.0%
Unbilled service revenues	17,636	19,234	18,246	(1,598)	(8.3%)
Halifax Regional Municipality	0	0	2,711	0	0.0%
Inventory	2,204	2,120	2,003	84	4.0%
Prepays	1,935	724	1,570	1,211	167.3%
	111,465	96,096	89,913	15,369	16.0%
Capital work in progress	76,808	65,357	30,908	11,451	17.5%
Utility plant in service	1,290,269	1,287,673	1,334,519	2,596	0.2%
Total assets	1,478,542	1,449,126	1,455,340	29,416	2.0%
Regulatory deferral account	2,445	2,637	2,620	(192)	(7.3%)
Total assets and regulatory deferral account	\$ 1,480,987	\$ 1,451,763	\$ 1,457,960	\$ 29,224	2.0%
Liabilities					
Current					
Payables and accruals					
Trade	11,111	11,460	12,644	(349)	(3.0%)
Non-trade	4,755	4,561	6,192	194	4.3%
Interest on long term debt	1,961	2,122	2,065	(161)	(7.6%)
Halifax Regional Municipality	2,184	2,986	0	(802)	(26.9%)
Contractor and customer deposits	2,389	2,312	2,115	77	3.3%
Current portion of long term debt	48,908	20,559	20,559	28,349	137.9%
Unearned revenue	1,036	1,087	561	(51)	(4.7%)
	72,344	45,087	44,136	27,257	60.5%
Long term debt	175,256	204,089	204,106	(28,833)	(14.1%)
Deferred contributions	72,642	55,184	55,699	17,458	31.6%
Total liabilities	320,242	304,360	303,941	15,882	5.2%
Equity					
Accumulated capital surplus	1,114,640	1,099,861	1,105,918	14,779	1.3%
Accumulated operating surplus	35,706	41,002	46,289	(5,296)	(12.9%)
Operating surplus used to fund capital	12,380	12,380	12,380	0	0.0%
Deficiency of revenues over expenditures	(1,981)	(5,840)	(10,568)	3,859	(66.1%)
Total equity	1,160,745	1,147,403	1,154,019	13,342	1.2%
Total liabilities and equity	\$ 1,480,987	\$ 1,451,763	\$ 1,457,960	\$ 29,224	2.0%

HALIFAX WATER
UNAUDITED STATEMENT OF EARNINGS - ALL SERVICES - NSUARB
APRIL 1, 2021 - FEBRUARY 28, 2022 (11 MONTHS)
ACTUAL YEAR TO DATE COMPLETE: 91.67%

	ACTUAL YEAR TO DATE THIS YEAR '000	LAST YEAR '000	APR 1/21 MAR 31/22 BUDGET '000	APR 1/21 MAR 31/22 FORECAST '000	ACTUAL YEAR TO DATE as % of BUDGET	ACTUAL YEAR TO DATE as % of FORECAST
Operating revenues						
Water	\$ 44,123	\$ 43,717	\$ 48,423	\$ 48,654	91.12%	90.69%
Wastewater	73,937	63,958	80,618	81,249	91.71%	91.00%
Stormwater site generated service	5,858	5,565	6,051	6,537	96.81%	89.61%
Stormwater right of way service	3,515	3,515	3,835	3,835	91.66%	91.66%
Fire protection (public and private)	8,149	7,510	8,940	8,963	91.15%	90.92%
Other services and fees	1,168	1,161	1,417	1,322	82.43%	88.35%
Late payment and other connection fees	570	252	563	550	101.24%	103.64%
Miscellaneous	643	408	620	677	103.71%	94.98%
	137,963	126,086	150,467	151,787	91.69%	90.89%
Operating expenditures						
Water supply and treatment	9,894	9,100	10,778	10,575	91.80%	93.56%
Water transmission and distribution	10,103	10,546	11,876	11,778	85.07%	85.78%
Wastewater collection	13,326	12,962	12,604	12,348	105.73%	107.92%
Stormwater collection	3,997	4,434	5,885	5,037	67.92%	79.35%
Wastewater treatment	19,523	18,623	22,071	21,378	88.46%	91.32%
Engineering and technology services	10,014	8,337	12,931	13,421	77.44%	74.61%
Regulatory services	3,991	3,582	4,472	4,312	89.24%	92.56%
Customer services	4,512	4,460	5,837	4,996	77.30%	90.31%
Corporate services	2,668	178	3,124	3,156	85.40%	84.54%
Administration services	3,596	4,996	4,928	4,725	72.97%	76.11%
Depreciation and amortization	26,539	24,599	30,873	29,911	85.96%	88.73%
	108,163	101,817	125,379	121,637	86.27%	88.92%
Earnings from operations before financial and other revenues and expenditures	29,800	24,269	25,088	30,150	118.78%	98.84%
Financial and other revenues						
Interest	160	202	173	163	92.49%	98.16%
Other	530	514	549	620	96.54%	85.48%
	690	716	722	783	95.57%	88.12%
Financial and other expenditures						
Interest on long term debt	6,353	6,527	7,603	6,822	83.56%	93.13%
Repayment on long term debt	19,646	18,634	22,716	21,559	86.49%	91.13%
Amortization of debt discount	209	195	258	229	81.01%	91.27%
Dividend/grant in lieu of taxes	6,074	5,417	6,837	6,626	88.84%	91.67%
Other	189	52	46	160	410.87%	118.13%
	32,471	30,825	37,460	35,396	86.68%	91.74%
Loss for the year	\$ (1,981)	\$ (5,840)	\$ (11,650)	\$ (4,463)	17.00%	44.39%

	From Prior Year \$ Change %	Actual to Forecast \$ Remaining % Remaining	Budget to Forecast \$ Change % Change
	\$ 406 9,979 293 0 639 7 318 235 11,877	0.93% 15.60% 5.27% 0.00% 8.51% 0.60% 126.19% 57.60% 9.42%	\$ (4,531) (7,312) (679) (320) (814) (154) 20 (34) (13,824)
	794 (443) 364 (437) 900 1,677 52 2,490 1,940 6,346	8.73% (4.20%) 2.81% (9.86%) 4.83% 20.12% 1.17% 1398.88% 7.89% 6.23%	(203) (98) (256) (848) (693) (490) (841) 32 (962) (3,742)
	5,531	(350)	5,062
	(42) 16 (26)	(3) (90) (93)	(10) 71 61
	(174) 1,012 14 657 137 1,646	(2.67%) 5.43% 7.18% 12.13% 263.46% 5.34%	(781) (1,157) (29) (211) 114 (2,064)
	\$ 3,859	\$ 2,482	\$ 7,187
	(66.08%)	(55.61%)	(61.69%)

Earnings (loss) for the year

HALIFAX WATER

UNAUDITED STATEMENT OF EARNINGS - STORMWATER - NSUARB

APRIL 1, 2021 - FEBRUARY 28, 2022 (11 MONTHS)

ACTUAL YEAR TO DATE COMPLETE: 91.67%

	ACTUAL THIS YEAR	LAST YEAR	APR 31/21 BUDGET	APR 1/20 FORECAST	ACTUAL YEAR TO DATE as % of BUDGET	ACTUAL YEAR TO DATE as % of FORECAST	ACTUAL as % of FORECAST	From Prior Year \$ Change	% Change	Actual to Forecast \$ Remaining	% Remaining	Budget to Forecast \$ Change	% Change
Operating revenues													
Stormwater site generated service	\$ 5,858	\$ 5,565	\$ 6,051	\$ 6,537	96.81%	89.61%	89.61%	\$ 293	5.27%	\$ (679)	(10.39%)	\$ 486	8.03%
Stormwater right of way service	3,515	3,515	3,835	3,835	91.66%	91.66%	91.66%	0	0.00%	(320)	(8.34%)	0	0.00%
Late payment and other connection fees	127	6	104	89	122.12%	142.70%	142.70%	121	2016.67%	38	42.70%	(15)	(14.42%)
Miscellaneous	115	95	97	88	118.56%	130.68%	130.68%	20	21.05%	27	30.68%	(9)	(9.28%)
	9,615	9,181	10,087	10,549	95.32%	91.15%	91.15%	434	4.73%	(934)	(8.85%)	462	4.58%
Operating expenditures													
Stormwater collection	3,997	4,434	5,885	5,037	67.92%	79.35%	79.35%	(437)	(9.86%)	(1,040)	(20.65%)	(848)	(14.41%)
Engineering and technology services	572	456	1,396	1,438	40.97%	39.78%	39.78%	116	25.44%	(866)	(60.22%)	42	3.01%
Regulatory services	1,430	1,359	1,684	1,602	84.92%	89.26%	89.26%	71	5.22%	(172)	(10.74%)	(82)	(4.87%)
Customer services	260	240	341	297	76.25%	87.54%	87.54%	20	8.33%	(37)	(12.46%)	(44)	(12.90%)
Corporate services	184	0	214	217	85.98%	84.79%	84.79%	184	0.00%	(33)	(15.21%)	3	1.40%
Administration services	247	395	338	324	73.08%	76.23%	76.23%	(148)	(37.47%)	(77)	(23.77%)	(14)	(4.14%)
Depreciation and amortization	2,104	1,905	2,046	2,368	102.83%	88.85%	88.85%	199	10.45%	(264)	(11.15%)	322	15.74%
	8,794	8,789	11,904	11,283	73.87%	77.94%	77.94%	5	0.06%	(2,489)	(22.06%)	(621)	(5.22%)
Earnings from operations before financial and other revenues and expenditures	821	392	(1,817)	(734)	(45.18%)	(111.85%)	(111.85%)	429	109.44%	1,555	(211.85%)	1,083	(59.60%)
Financial and other revenues													
Interest	17	32	31	18	54.84%	94.44%	94.44%	(15)	(46.88%)	(1)	(5.56%)	(13)	(41.94%)
	17	32	31	18	54.84%	94.44%	94.44%	(15)	(46.88%)	(1)	(5.56%)	(13)	(41.94%)
Financial and other expenditures													
Interest on long term debt	668	627	791	720	84.45%	92.78%	92.78%	41	6.54%	(52)	(7.22%)	(71)	(8.98%)
Repayment on long term debt	1,883	1,647	2,156	1,986	87.34%	94.81%	94.81%	236	14.33%	(103)	(5.19%)	(170)	(7.88%)
Amortization of debt discount	20	17	25	22	80.00%	90.91%	90.91%	3	17.65%	(2)	(9.09%)	(3)	(12.00%)
Dividend/grant in lieu of taxes	125	56	154	136	81.17%	91.91%	91.91%	69	123.21%	(11)	(6.09%)	(18)	(11.69%)
	2,696	2,347	3,126	2,864	86.24%	94.13%	94.13%	349	14.87%	(468)	(5.87%)	(262)	(8.38%)
Loss for the year	\$ (1,858)	\$ (1,923)	\$ (4,912)	\$ (3,580)	37.83%	51.90%	51.90%	65	(3.38%)	\$ 1,722	(48.10%)	\$ 1,332	(27.12%)

HALIFAX WATER
UNAUDITED STATEMENT OF EARNINGS - REGULATED AND UNREGULATED ACTIVITIES - NSUARB
APRIL 1, 2021 - FEBRUARY 28, 2022 (11 MONTHS)
ACTUAL YEAR TO DATE COMPLETE: 91.67%

REGULATED ACTIVITIES	ACTUAL				APR 1/20		MAR 31/21		ACTUAL		ACTUAL	
	YEAR TO DATE				BUDGET		FORECAST		as % of		YEAR TO DATE	
	THIS YEAR	LAST YEAR	'000	'000	'000	'000	'000	'000	as % of	BUDGET	as % of	FORECAST
Operating revenues												
Water	\$ 44,123	\$ 43,717	\$	48,423	\$	48,654		91.12%		90.69%		
Wastewater	73,937	63,958	80,618	81,249	91.71%	91,00%		91.00%		90.37%		
Stormwater	9,373	9,080	9,886	10,372	94.81%	90.37%		94.81%		90.37%		
Public fire protection	6,992	6,894	7,628	7,628	91.66%	91.66%		91.66%		91.66%		
Private fire protection	1,157	816	1,312	1,335	88.19%	86.67%		88.19%		86.67%		
Miscellaneous	1,487	935	1,497	1,529	99.33%	97.25%		99.33%		97.25%		
	137,069	125,200	149,364	150,767	91.77%	90.91%		91.77%		90.91%		
Operating expenditures												
Water supply and treatment	9,858	9,086	10,746	10,543	91.74%	93.50%		91.74%		93.50%		
Water transmission and distribution	10,103	10,546	11,876	11,778	85.07%	85.78%		85.07%		85.78%		
Wastewater collection	13,308	12,919	12,516	12,260	106.33%	108.55%		106.33%		108.55%		
Stormwater collection	3,997	4,434	5,885	5,037	67.92%	79.35%		67.92%		79.35%		
Wastewater treatment	18,879	18,144	21,312	20,619	88.58%	91.56%		88.58%		91.56%		
Engineering and technology services	10,014	8,337	12,931	13,421	77.44%	74.61%		77.44%		74.61%		
Regulatory services	3,991	3,582	4,472	4,312	89.24%	92.56%		89.24%		92.56%		
Customer services	4,511	4,410	5,837	4,966	77.28%	90.29%		77.28%		90.29%		
Corporate services	2,652	178	3,111	3,143	84.38%	85.25%		84.38%		85.25%		
Administration services	3,494	4,982	4,628	4,628	72.32%	75.50%		72.32%		75.50%		
Depreciation and amortization	26,523	24,583	30,855	29,893	85.96%	88.73%		85.96%		88.73%		
	107,330	101,201	124,372	120,630	86.30%	88.97%		86.30%		88.97%		
Earnings from operations before financial and other revenues and expenditures	29,739	23,999	24,992	30,137	118.99%	98.68%		118.99%		98.68%		
Financial and other revenues												
Interest	160	202	173	163	92.49%	98.16%		92.49%		98.16%		
Other	25	26	39	1	64.10%	2500.00%		64.10%		2500.00%		
	185	228	212	164	87.26%	112.80%		87.26%		112.80%		
Financial and other expenditures												
Interest on long term debt	6,353	6,527	7,592	6,811	83.68%	93.28%		83.68%		93.28%		
Repayment on long term debt	19,646	18,634	22,692	21,535	86.56%	91.23%		86.56%		91.23%		
Amortization of debt discount	209	195	258	229	81.01%	91.27%		81.01%		91.27%		
Dividend/grant in lieu of taxes	6,074	5,417	6,937	6,626	88.84%	91.67%		88.84%		91.67%		
	32,282	30,773	37,379	35,201	86.36%	91.71%		86.36%		91.71%		
Loss for the year - Regulated	\$ (2,358)	\$ (6,546)	\$ (12,175)	\$ (4,900)	19.37%	48.12%		19.37%		48.12%		

REGULATED ACTIVITIES	ACTUAL				APR 1/20		MAR 31/21		ACTUAL		ACTUAL	
	YEAR TO DATE				BUDGET		FORECAST		as % of		YEAR TO DATE	
	THIS YEAR	LAST YEAR	'000	'000	'000	'000	'000	'000	as % of	BUDGET	as % of	FORECAST
Operating revenues												
Water	\$ 44,123	\$ 43,717	\$	48,423	\$	48,654		91.12%		90.69%		
Wastewater	73,937	63,958	80,618	81,249	91.71%	91,00%		91.00%		90.37%		
Stormwater	9,373	9,080	9,886	10,372	94.81%	90.37%		94.81%		90.37%		
Public fire protection	6,992	6,894	7,628	7,628	91.66%	91.66%		91.66%		91.66%		
Private fire protection	1,157	816	1,312	1,335	88.19%	86.67%		88.19%		86.67%		
Miscellaneous	1,487	935	1,497	1,529	99.33%	97.25%		99.33%		97.25%		
	137,069	125,200	149,364	150,767	91.77%	90.91%		91.77%		90.91%		
Operating expenditures												
Water supply and treatment	9,858	9,086	10,746	10,543	91.74%	93.50%		91.74%		93.50%		
Water transmission and distribution	10,103	10,546	11,876	11,778	85.07%	85.78%		85.07%		85.78%		
Wastewater collection	13,308	12,919	12,516	12,260	106.33%	108.55%		106.33%		108.55%		
Stormwater collection	3,997	4,434	5,885	5,037	67.92%	79.35%		67.92%		79.35%		
Wastewater treatment	18,879	18,144	21,312	20,619	88.58%	91.56%		88.58%		91.56%		
Engineering and technology services	10,014	8,337	12,931	13,421	77.44%	74.61%		77.44%		74.61%		
Regulatory services	3,991	3,582	4,472	4,312	89.24%	92.56%		89.24%		92.56%		
Customer services	4,511	4,410	5,837	4,966	77.28%	90.29%		77.28%		90.29%		
Corporate services	2,652	178	3,111	3,143	85.25%	84.38%		85.25%		84.38%		
Administration services	3,494	4,982	4,628	4,628	72.32%	75.50%		72.32%		75.50%		
Depreciation and amortization	26,523	24,583	30,855	29,893	85.96%	88.73%		85.96%		88.73%		
	107,330	101,201	124,372	120,630	86.30%	88.97%		86.30%		88.97%		
Earnings from operations before financial and other revenues and expenditures	29,739	23,999	24,992	30,137	118.99%	98.68%		118.99%		98.68%		
Financial and other revenues												
Interest	160	202	173	163	92.49%	98.16%		92.49%		98.16%		
Other	25	26	39	1	64.10%	2500.00%		64.10%		2500.00%		
	185	228	212	164	87.26%	112.80%		87.26%		112.80%		
Financial and other expenditures												
Interest on long term debt	6,353	6,527	7,592	6,811	83.68%	93.28%		83.68%		93.28%		
Repayment on long term debt	19,646	18,634	22,692	21,535	86.56%	91.23%		86.56%		91.23%		
Amortization of debt discount	209	195	258	229	81.01%	91.27%		81.01%		91.27%		
Dividend/grant in lieu of taxes	6,074	5,417	6,937	6,626	88.84%	91.67%		88.84%		91.67%		
	32,282	30,773	37,379	35,201	86.36%	91.71%		86.36%		91.71%		
Loss for the year - Regulated	\$ (2,358)	\$ (6,546)	\$ (12,175)	\$ (4,900)	19.37%	48.12%		19.37%		48.12%		

REGULATED ACTIVITIES	ACTUAL				APR 1/20		MAR 31/21		ACTUAL		ACTUAL	
	YEAR TO DATE				BUDGET		FORECAST		as % of		YEAR TO DATE	
	THIS YEAR	LAST YEAR	'000	'000	'000	'000	'000	'000	as % of	BUDGET	as % of	FORECAST
Operating revenues												
Water	\$ 44,123	\$ 43,717	\$	48,423	\$	48,654		91.12%		90.69%		
Wastewater	73,937	63,958	80,618	81,249	91.71%	91,00%		91.00%		90.37%		
Stormwater	9,373	9,080	9,886	10,372	94.81%	90.37%		94.81%		90.37%		
Public fire protection	6,992	6,894	7,628	7,628	91.66%	91.66%		91.66%		91.66%		
Private fire protection	1,157	816	1,312	1,335	88.19%	86.67%		88.19%		86.67%		
Miscellaneous	1,487	935	1,497	1,529	99.33%	97.25%		99.33%		97.25%		
	137,069	125,200	149,364	150,767	91.77%	90.91%		91.77%		90.91%		
Operating expenditures												
Water supply and treatment	9,858	9,086	10,746	10,543	91.74%	93.50%		91.74%		93.50%		
Water transmission and distribution	10,103	10,546	11,876	11,778	85.07%	85.78%		85.07%		85.78%		
Wastewater collection	13,308	12,919	12,516	12,260	106.33%	108.55%		106.33%		108.55%		
Stormwater collection	3,997	4,434	5,885	5,037	67.92%	79.35%		67.92%		79.35%		
Wastewater treatment	18,879	18,144	21,312	20,619	88.58%	91.56%		88.58%		91.56%		
Engineering and technology services	10,014	8,337	12,931	13,421	77.44%	74.61%		77.44%		74.61%		
Regulatory services	3,991	3,582	4,472	4,312	89.24%	92.56%		89.24%		92.56%		
Customer services	4,511	4,410	5,837	4,966	77.28%	90.29%		77.28%		90.29%		
Corporate services	2,652	178	3,111	3,143	85.25%	84.38%		85.25%		84.38%		
Administration services	3,494	4,982	4,628	4,628	72.32%	75.50%		72.32%		75.50%		
Depreciation and amortization	26,523	24,583	30,855	29,893	85.96%	88.73%		85.96%		88.73%		
	107,330	101,201	124,372	120,630	86.30%	88.97%		86.30%		88.97%		
Earnings from operations before financial and other revenues and expenditures	29,739	23,999	24,992	30,137	118.99%	98.68%		118.99%		98.68%		
Financial and other revenues												
Interest	160	202	173	163	92.49%	98.16%		92.49%		98.16%		
Other	25	26	39	1	64.10%	2500.00%		64.10%		2500.00%		
	185	228	212	164	87.26%	112.80%		87.26%		112.80%		
Financial and other expenditures												
Interest on long term debt	6,353	6,527	7,592	6,811	83.68%	93.28%		83.68%		93.28%		
Repayment on long term debt	19,646	18,634	22,692	21,535	86.56%	91.23%		86.56%		91.23%		
Amortization of debt discount	209	195	258	229	81.01%	91.27%		81.01%		91.27%		
Dividend/grant in lieu of taxes	6,074	5,417	6,937	6,626	88.84%	91.67%		88.84%		91.67%		
	32,282	30,773	37,379	35,201	86.36%	91.71%		86.36%		91.71%		
Loss for the year - Regulated	\$ (2,358)	\$ (6,546)	\$ (12,175)	\$ (4,900)	19.37%	48.12%		19.37%		48.12%		

REGULATED ACTIVITIES	ACTUAL				APR 1/20		MAR 31/21		ACTUAL		ACTUAL	
	YEAR TO DATE				BUDGET		FORECAST		as % of		YEAR TO DATE	
	THIS YEAR	LAST YEAR	'000	'000	'000	'000	'000	'000	as % of	BUDGET	as % of	FORECAST
Operating revenues												
Water	\$ 44,123	\$ 43,717	\$	48,423	\$	48,654		91.12%		90.69%		
Wastewater	73,937	63,958	80,618	81,249	91.71%	91,00%		91.00%		90.37%		
Stormwater	9,373	9,080	9,886	10,372	94.81%	90.37%		94.81%		90.37%		
Public fire protection	6,992	6,894	7,628	7,628	91.66%	91.66%		91.66%		91.66%</		

HALIFAX REGIONAL WATER COMMISSION
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CoCd	Recon acct	Vendor	Name 1	Country	PostalCode	City	Street	Rg	Crcy	Purchasing
HRWC	2110	54	HALIFAX REGIONAL MUNICIPALITY	CA	B3J 3A5	HALIFAX		NS	CAD	15,301,237.53
HRWC	2020	146	NS POWER INC.	CA	B3J 2W5	HALIFAX	P.O. BOX 910	NS	CAD	7,676,210.06
HRWC	2020	1215	THE NORTHERN TRUST COMPANY	CA	M5H 1J8	TORONTO	145 KING STREET WEST, SUITE 1910	ON	CAD	6,189,748.00
HRWC	2020	559	BRYCON CONSTRUCTION LTD.	CA	B2Y 4P4	DARTMOUTH	67 ATLANTIC ST	NS	CAD	4,037,348.65
HRWC	2020	109	DEXTER CONSTRUCTION COMPANY LI	CA	B4A 3Z2	BEDFORD		NS	CAD	3,538,619.16
HRWC	2020	1151	N-VIRO SYSTEMS CANADA LP	CA	B2T 1K3	GOFFS	350 AEROTECH PARK DR	NS	CAD	3,380,007.27
HRWC	2020	1689	LANDMARK STRUCTURES CO.	CA	L7R 3X4	BURLINGTON	3091 HARRISON COURT	ON	CAD	3,101,750.36
HRWC	2020	1715	INSITUFORM TECHNOLOGIES LIMITE	CA	T6P 1N9	EDMONTON	7605 18TH STREET	AB	CAD	2,787,145.36
HRWC	2020	133	CHEMTRADE	CA	M5W 1P8	TORONTO		ON	CAD	2,725,946.52
HRWC	2020	2732	N HARRIS COMPUTER CORPORATION	CA	K2E 8C4	OTTAWA	1 ANLARES DRIVE, SUITE 400	ON	CAD	2,532,237.29
HRWC	2020	447	HARBOR CONSTRUCTION COMPANY L	CA	B3B 1L3	DARTMOUTH	40 ISLEY AVE	NS	CAD	2,289,583.41
HRWC	2020	277	SACKVILLE TRENCHING LTD.	CA	B4C 3G4	LOWER SACKVILLE		NS	CAD	2,176,719.90
HRWC	2020	2251	ATLANTIC ROAD CONSTRUCTION & P	CA	B3G 1M7	EASTERN PASSAGE		NS	CAD	2,015,258.89
HRWC	2020	2180	EASTERN TRAFFIC SERVICES LIMIT	CA	B4A 3Z2	BEDFORD	927 ROCKY LAKE DRIVE	NS	CAD	1,860,242.52
HRWC	2020	403	CBCL LIMITED	CA	B3J 2R7	HALIFAX		NS	CAD	1,799,001.50
HRWC	2020	111	G & R KELLY ENTERPRISES LTD.	CA	B4B 1B1	BEDFORD	738 HAMMONDS PLAINS ROAD	NS	CAD	1,677,566.57
HRWC	2020	2	BLACK & MCDONALD LTD.	CA	B3B 126	DARTMOUTH	10 PAYZANT AVENUE	NS	CAD	1,548,879.66
HRWC	2020	340	MEDAVIE BLUE CROSS	CA	E1C 8L3	MONCTON		NB	CAD	1,429,620.11
HRWC	2020	2797	AMG ENVIRONMENTAL INC	CA	L4N 9J5	BARRIE	494 VETERANS DR, UNIT 12	ON	CAD	1,398,521.90
HRWC	2020	3342	EASTERN TRENCHLESS LTD.	CA	E3B 5N8	FREDERICTON	711 WOODSTOCK RD	NB	CAD	1,265,004.63
HRWC	2020	283	W. ERIC WHEBBY LTD.	CA	B3B 1W2	DARTMOUTH	201 BROWNLOW AVE., UNIT 57	NS	CAD	1,181,958.11
HRWC	2020	2476	CGI INFORMATION SYSTEMS AND MG	CA	E3C 2R2	FREDERICTON	30 KNOWLEDGE PARK DRIVE - SUITE #30	NB	CAD	961,244.37
HRWC	2020	1216	THE NORTHERN TRUST COMPANY	CA	M5H 1J8	TORONTO	145 KING STREET WEST, SUITE 1910	ON	CAD	936,730.70
HRWC	2020	3101	MEDAVIE INC. (LTD & LIFE)	CA	E1C 8L3	MONCTON	644 MAIN STREET	NB	CAD	935,621.31
HRWC	2020	1249	SNF CANADA LIMITED	CA	L4L 3Z5	VAUGHAN	4 DIRECTOR COURT, SUITE 101	ON	CAD	914,898.26
HRWC	2020	147	BRENNTAG CANADA INC.	CA	M8Z 2G6	TORONTO	43 JUTLAND ROAD	ON	CAD	830,924.95
HRWC	2020	99	IMP GROUP LIMITED	CA	B3L 4T1	HALIFAX	2651 JOSEPH HOWE DRIVE, STE 400	NS	CAD	808,165.82
HRWC	2020	1	ONE TIME VENDOR	CA					CAD	749,499.60
HRWC	2020	18	ATLANTIC PURIFICATION SYSTEM	CA	B2Y 3Z5	DARTMOUTH		NS	CAD	744,807.77
HRWC	2020	262	OCEAN CONTRACTORS LIMITED	CA	B2Y 3Y9	DARTMOUTH		NS	CAD	730,350.72
HRWC	2020	696	MINISTER OF FINANCE FOR NS	CA	B3J 2V2	HALIFAX	HALIFAX CENTRAL	NS	CAD	676,895.19
HRWC	2020	3069	FOAM & COATING PROS LIMITED	CA	B0N 2T0	WINDSOR	6536 HWY #14, RR #1	NS	CAD	670,685.71
HRWC	2020	1824	BULLETPROOF SOLUTIONS INC.	CA	E3C 2N5	FREDERICTON	25 ALISON BLVD	NB	CAD	667,583.58
HRWC	2020	2454	BOURQUE SECURITY SERVICES	CA	B3S 1B5	HALIFAX	55 CRANE LAKE DR	NS	CAD	637,176.89
HRWC	2020	1821	WEST BEDFORD HOLDINGS LIMITED	CA	B3M 4G2	HALIFAX	255 LACEWOOD DRIVE, SUITE 100C	NS	CAD	629,909.03
HRWC	2020	3124	PIVOT CONSULTING INC.	CA	B3J 1P3	HALIFAX	5251 DUKE ST, SUITE 1210, DUKE TOWE	NS	CAD	629,049.68
HRWC	2020	620	BARRINGTON CONSULTING GROUP IN	CA	B3J 3R7	HALIFAX	1696 UPPER WATER STREET, TWR 2, STE	NS	CAD	619,525.78
HRWC	2020	953	MCCARTHY'S ROOFING LTD.	CA	B2W 3V1	DARTMOUTH	850 MAIN STREET	NS	CAD	617,421.15
HRWC	2020	47	CN NON FREIGHT	CA	M5W 5S5	TORONTO		ON	CAD	609,591.40
HRWC	2020	2299	VEOLIA WATER SOLUTIONS & TECHN	CA	H4S 2B3	SAINT-LAURENT	4105 RUE SARTELON	QC	CAD	602,554.22
HRWC	2020	1447	OLSEN'S MECHANICAL LIMITED	CA	B0N 2T0	WINDSOR	88 SANFORD DRIVE	NS	CAD	593,646.41
HRWC	2020	370	MCLENNAN SALES (EMCO)	CA	NSW 3A7	LONDON	1108 DUNDAS STREET	ON	CAD	552,804.00
HRWC	2020	2828	ONX ENTERPRISE SOLUTIONS LTD	CA	L3T 7V8	THORNHILL	165 COMMERCE VALLEY DR W. #300	ON	CAD	538,284.98
HRWC	2020	246	ALPHA CHEMICAL LTD	CA	B3B 1K2	DARTMOUTH	40 PETTIPAS DRIVE	NS	CAD	533,241.08
HRWC	2020	1940	MICROSOFT LICENSING, GP	US	89511	RENO	6100 NEIL RD STE 210	NV	CAD	526,271.33
HRWC	2020	649	ENVIROSYSTEMS (TERRAPURE)	CA	B3B 1Z7	DARTMOUTH	11 BROWN AVENUE	NS	CAD	521,972.56
HRWC	2020	1976	WSP CANADA INC.	CA	H3C 5Z8	MONTREAL	SUCCURSALE CENTRE-VILLE	QC	CAD	504,435.58
HRWC	2020	754	ELMSDALE LANDSCAPING LTD.	CA	B2S 1K7	ELMSDALE	113 ELMSDALE ROAD	NS	CAD	490,705.02
HRWC	2020	41	BUREAU VERITAS CANADA (2019) I	CA	M5W 5V2	TORONTO	PO BOX 4269, POSTAL STN A	ON	CAD	476,251.21
HRWC	2020	77	ESRI CANADA LIMITED	CA	M3C 3R8	TORONTO	12 CONCORDE PLACE	ON	CAD	472,294.74
HRWC	2020	349	NS UTILITY & REVIEW BOARD	CA	B3J 3S3	HALIFAX	PO BOX 1692 UNIT M	NS	CAD	464,496.99
HRWC	2020	305	TOROMONT CAT	CA	B2Y 3Z6	DARTMOUTH	P.O. BOX 953	NS	CAD	449,577.00
HRWC	2020	394	DALHOUSIE UNIVERSITY	CA	B3H 4H6	HALIFAX	FINANCIAL SERVICES	NS	CAD	431,539.54
HRWC	2020	2421	TELUS CORPORATION	CA	L7R 4S8	BURLINGTON		ON	CAD	426,705.42
HRWC	2020	127	SANSOM EQUIPMENT LTD	CA	B2N 6W8	TRURO	100 UPHAM DRIVE	NS	CAD	412,506.51
HRWC	2020	2690	DESIGNPOINT ENGINEERING & SURV	CA	B4A 4J4	BEDFORD	200 WATERFRONT DR	NS	CAD	412,091.50
HRWC	2020	2215	CORNELL VIDEO INSPECTIONS	CA	B3B 1H5	DARTMOUTH	9 RALSTON AVENUE	NS	CAD	410,256.11
HRWC	2020	98	GRAYMONT (NB) INC.	CA	M5W 5V2	TORONTO		ON	CAD	395,108.44
HRWC	2020	1245	AIR LIQUIDE CANADA INC	CA	B2Y 3Z7	DARTMOUTH	180 AKERLEY BLVD	NS	CAD	391,901.53
HRWC	2020	505	WOLSELEY CANADA - MECHANICAL G	CA	L7N 3V6	BURLINGTON	880 LAURENTIAN DR	ON	CAD	388,834.83
HRWC	2020	297	C.R. FALKENHAM	CA	B4A 1N4	BEDFORD	8 LINDSAY HILL	NS	CAD	364,288.27
HRWC	2020	645	CANADA POST CORPORATION	CA	K1A 1L7	OTTAWA	2701 RIVERSIDE DRIVE	ON	CAD	359,142.29
HRWC	2020	264	XYLEM WATER SOLUTIONS	CA	H9R 4V5	POINT-CLAIRE	300 LABROSSE AVE	QC	CAD	353,480.32
HRWC	2020	860	UNIVAR CANADA LTD.	CA	M5W 0B8	TORONTO	PO BOX 4910, STATION A	ON	CAD	349,359.80
HRWC	2020	3521	R.V. ANDERSON ASSOCIATES LTD	CA	M2J 4Z8	TORONTO	2001 SHEPPARD AVENUE EAST SUITE 300	ON	CAD	344,099.95
HRWC	2020	1287	STANTEC CONSULTING LTD.	CA	T2P 2J2	CALGARY	C/O LOCKBOX 310260, BOX 578 STN M	AB	CAD	334,591.94
HRWC	2020	2095	EASTPOINT ENGINEERING LIMITED	CA	B3J 3N4	HALIFAX	1801 HOLLIS ST - SUITE #1500	NS	CAD	328,209.39
HRWC	2020	320	IRVING ENERGY DISTRIBUTION & M	CA	E2L 4C3	SAINT JOHN		NB	CAD	319,042.37
HRWC	2020	352	CARUS CORPORATION	US	60693	CHICAGO	1555 COLLECTIONS CENTER DR	IL	CAD	301,272.11
HRWC	2020	2371	BELL CANADA	CA	L4W 5R1	MISSISSAUGA	5115 CREEKBANK RD, E3-M2	ON	CAD	293,983.53
HRWC	2020	1392	L & R CONSTRUCTION LIMITED	CA	B0N 2J0	STEWIACKE	75 RIVER PARK RD., RR#2	NS	CAD	293,250.00
HRWC	2020	2926	ITRON CANADA INC	US	99019	LIBERTY LAKE	2111 N MOLTER RD	WA	CAD	292,838.67
HRWC	2020	1000	WESTERN PLUMBING & HEATING LTD	CA	B2Y 3Z3	DARTMOUTH		NS	CAD	292,511.60
HRWC	2020	2886	SNT SOLUTIONS INC	CA	B4B 1P7	HAMMONDS PLAINS	1411 LUCASVILLE RD	NS	CAD	290,540.74
HRWC	2020	3577	MINDWIRE SYSTEMS LTD	CA	K1Z 8P9	OTTAWA	1545 CARLING AVENUE - SUITE 308	ON	CAD	268,942.45
HRWC	2020	1565	LAURENTIDE CONTROLS	CA	H9J 4A1	KIRKLAND	18000 RTE TRANSCANADIENNE	QC	CAD	265,332.85
HRWC	2020	68	SOURCE ATLANTIC	CA	E2L 4E4	SAINT JOHN		NB	CAD	261,116.60
HRWC	2020	95	MUNICIPAL ENTERPRISES LIMITED	CA	B4A 3Z2	BEDFORD		NS	CAD	258,647.57
HRWC	2020	816	J.W. LINDSAY ENTERPRISES LTD.	CA	B3B 1E2	DARTMOUTH	22 FIELDING AVENUE	NS	CAD	256,951.08
HRWC	2020	829	JOE JOHNSON EQUIPMENT INC.	CA	L9S 3V6	INNISFIL	2521 BOWMAN STREET	ON	CAD	254,116.18
HRWC	2020	1551	MACPHEE FORD SALES	CA	B2W 3M3	DARTMOUTH	580 PORTLAND ST	NS	CAD	250,483.80
HRWC	2020	3184	MUSIAL'S COMPUTER CONSULTING I	CA	B1T 1N9	BEAVER COVE	5192 GRAND NARROWS HWY	NS	CAD	245,941.88
HRWC	2020	1421	ATLANTICA MECHANICAL CONTRACTO	CA	B3B 1H5	DARTMOUTH	9 RALSTON AVENUE	NS	CAD	237,955.03
HRWC	2020	2289	DALE FABRICATION INC.	CA	B4E 3C1	UPPER SACKVILLE	43 CARIBOU ROAD	NS	CAD	224,405.94
HRWC	2020	51	LINDE	CA	H3B 3L2	MONTREAL		QC	CAD	222,679.60
HRWC	2020	1989	RASMUSSEN'S WELDING LTD.	CA	B2X 3G8	DARTMOUTH	16 CAPRI COURT	NS	CAD	221,394.61

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CoCd	Recon acct	Vendor	Name 1	Country	PostalCode	City	Street	Rg	Crcy	Purchasing
HRWC	2020	867	MITCHELMORE ENGINEERING	CA	B35 158	DARTMOUTH	109 ILSLEY AVE, UNIT 14	NS	CAD	220,148.50
HRWC	2020	92	BATTLEFIELD EQUIPMENT RENTALS	CA	B3B 2B1	DARTMOUTH	185 AKERLEY BLVD	NS	CAD	218,966.64
HRWC	2020	2892	Suez Treatment Solutions Inc	US	23255	Richmond		VA	CAD	213,835.33
HRWC	2020	959	WATCHDOG SECURITY SYSTEMS	CA	B3M 4H4	HALIFAX		NS	CAD	213,132.28
HRWC	2020	2848	JOHN BROOKS	CA	L5N 7K5	MISSISSAUGA	2625 MEADOWPINE BLVD	ON	CAD	212,077.10
HRWC	2020	3517	CUPE NATIONAL (LOCAL 227)	CA	K1G 0Z7	OTTAWA	1375 ST. LAURENT BLVD	ON	CAD	204,235.24
HRWC	2020	263	MCINNES COOPER	CA	B3J 3R7	HALIFAX	1969 UPPER WATER ST	NS	CAD	204,132.40
HRWC	2020	3640	ADS ENVIRONMENTAL TECHNOLOGIES	US	35806	HUNTVILLE	340 BRIDGE STREET - SUITE 204	AL	CAD	196,977.75
HRWC	2020	2463	MARINER PARTNERS INC	CA	E2L 5G5	SAINT JOHN	12 SMYTHE STREET, 3RD FLOOR	NB	CAD	195,528.75
HRWC	2020	3558	PSD CITYWIDE INC	CA	N6A 5P3	LONDON	148 FULFORD ST, 9TH FLOOR	ON	CAD	189,980.00
HRWC	2020	3480	ENVIROGEM INC	CA	L5M 5L5	MISSISSAUGA	2529 RAGLAN COURT	ON	CAD	189,819.48
HRWC	2020	2367	GIL-SON CONSTRUCTION LTD.	CA	B3T 1P3	GOODWOOD	1 MILLS DRIVE	NS	CAD	184,599.37
HRWC	2020	549	ROBINSON CONSULTANTS	CA	K2V 1A8	KANATA	350 PALLADIUM DRIVE	ON	CAD	183,719.03
HRWC	2020	934	L & B ELECTRIC LTD.	CA	B4V 3V4	BRIDGEWATER	94 WENTZELL DRIVE	NS	CAD	181,256.35
HRWC	2020	2199	DITCH DOCTOR ATLANTIC LIMITED	CA	B0M 1G0	GLENHOLME	2896 HIGHWAY #4	NS	CAD	179,687.50
HRWC	2020	332	SUEZ WATER TECHNOLOGIES & SOLU	CA	H3C 5H1	MONTREAL		QC	CAD	177,742.82
HRWC	2020	612	ADM SYSTEMS ENGINEERING LTD.	CA	E2M 3X8	ST. JOHN	1465 MANAWAGONISH ROAD	NB	CAD	175,492.41
HRWC	2020	1272	ROYAL ENVIRONMENTAL INC	CA	B3M 2T2	HALIFAX	209 KEARNEY LAKE DRIVE	NS	CAD	174,273.52
HRWC	2020	128	BELL ALIANT MOBILITY INC	CA	L7R 4R7	BURLINGTON		ON	CAD	164,669.74
HRWC	2020	3202	NOVA SPATIAL	CA	B4A 3R4	BEDFORD	130 BEDFORD HILLS ROAD	NS	CAD	164,446.23
HRWC	2020	1126	EVOQUA WATER TECHNOLOGIES LLC	US	30022	ALPHARETTA	4800 NORTH POINT PARKWAY - SUITE #25	GA	CAD	164,068.83
HRWC	2020	548	IMPERIAL CLEANERS LTD.	CA	B2W 6B2	DARTMOUTH	PO BOX 21057	NS	CAD	163,670.88
HRWC	2020	3260	ENGLOBE CORP.	CA	B3R 2A7	DARTMOUTH	97 TROOP AVE	NS	CAD	163,236.00
HRWC	2020	3565	AVERTRA CORP	US	20170	HERNDON	580 HERNDON PARKWAY	VA	CAD	155,390.85
HRWC	2020	2298	FILTRUM CONSTRUCTION	CA	G1M 1B3	QUEBEC	430 RUE DES ENTREPRENEURS	QC	CAD	154,241.23
HRWC	2020	153	NORTHEAST EQUIPMENT LIMITED	CA	B3B 1W1	DARTMOUTH	135 JOSEPH ZATZMAN DRIVE	NS	CAD	151,442.12
HRWC	2020	2940	LABATT BREWING COMPANY LIMITED	CA	M5J 1A7	TORONTO	207 QUEEN'S QUAY WEST, SUITE 299	ON	CAD	151,433.07
HRWC	2020	364	ACKLANDS GRAINGER INC.	CA	R3C 4B5	WINNIPEG		MB	CAD	149,895.57
HRWC	2020	2488	BLUEROCK CONSTRUCTION	CA	B3E 1C6	LAKE ECHO	3416 HIGHWAY #7	NS	CAD	148,317.57
HRWC	2020	3652	KLIR INC	US	89501	RENO	1 E LIBERTY ST #600	NV	CAD	144,900.00
HRWC	2020	1268	FOURNIER INDUSTRIES INC	CA	G6H 2B5	THETFORD MINES	3787 BOULEVARD FRONTENAC OUEST	QC	CAD	144,262.35
HRWC	2020	367	CONRAD BROTHERS LTD	CA	B2W 3Y2	DARTMOUTH	PO BOX 2129 DARTMOUTH EAST	NS	CAD	141,972.33
HRWC	2020	3136	GARTNER CANADA CO.	CA	M2N 7E9	TORONTO	5000 YONGE ST, 14TH FLOOR, SUITE 14	ON	CAD	137,195.00
HRWC	2020	1347	NATIONAL PROCESS EQUIPMENT INC	CA	B3B 1L5	DARTMOUTH	95 ISLEY AVENUE UNIT C	NS	CAD	134,106.97
HRWC	2020	2649	C & C SAFETY & COMPLIANCE SERV	CA	B3M 4X2	HALIFAX	64 BEDROS LANE, APT 603	NS	CAD	131,563.32
HRWC	2020	2883	VALMET LTD	CA	H4R 2B2	ST LAURENT	4900 BOUL THIMENS	QC	CAD	131,206.26
HRWC	2020	2839	ROGERS ELECTRIC & MACHINE	CA	E2A 4W7	BATHURST	1990 CONNOLLY AVE	NB	CAD	130,396.67
HRWC	2020	159	P.S.C. EMPLOYEES' CREDIT UNION	CA	B3K 5M1	HALIFAX		NS	CAD	128,104.73
HRWC	2020	3458	CHERWELL SOFTWARE LLC	US	80908	COLORADO SPRINGS	10125 FEDERAL DRIVE SUITE 100	CO	CAD	127,717.12
HRWC	2020	1610	RECEIVER GENERAL FOR CANADA	CA	K1A 0K2	OTTAWA	101 COLONEL BY DR	ON	CAD	123,400.35
HRWC	2020	3564	BLUECONDUIT	US	48103	ANN ARBOR	315 2nd ST APT 205	MI	CAD	119,251.50
HRWC	2020	160	CANADIAN UNION OF PUBLIC EMPLO	CA	K1G 0Z7	Ottawa	1375 St. Laurent Blvd	ON	CAD	117,444.00
HRWC	2020	905	EASTLINK	CA	B3K 5M2	HALIFAX		NS	CAD	117,251.70
HRWC	2020	541	HACH SALES & SERVICE CANADA LP	CA	N5V 4T7	LONDON	3020 GORE RD	ON	CAD	117,208.99
HRWC	2020	1468	MEGA-LAB MANUFACTURING CO.LTD	CA	L4K 5R2	CONCORD	361 CONNIE CRESCENT, UNIT B	ON	CAD	116,869.81
HRWC	2020	121	MACFARLANDS RENTIT	CA	B3B 0I6	DARTMOUTH	34 CUTLER AVENUE	NS	CAD	115,921.16
HRWC	2020	1482	HERITAGE GAS LIMITED	CA	B2Y 4W3	DARTMOUTH		NS	CAD	115,091.25
HRWC	2020	420	NEPTUNE TECHNOLOGY GROUP	CA	M5W 2N7	TORONTO		ON	CAD	112,148.83
HRWC	2020	183	K & D PRATT LIMITED	CA	A1N 459	MOUNT PEARL	126 GLENCOE DRIVE	NL	CAD	110,836.62
HRWC	2020	399	ECKLER PARTNERS LTD.	CA	B3J 3R7	HALIFAX	1969 UPPER WATER STREET, STE 1306	NS	CAD	107,170.07
HRWC	2020	3017	KULVINDER DHILLON	CA	B3S 1K4	HALIFAX	22 PARKMOUNT CLOSE	NS	CAD	106,007.91
HRWC	2020	666	CAPS PLUS	CA	B4C 2K3	LWR. SACKVILLE	732 OLD SACKVILLE ROAD	NS	CAD	103,355.68
HRWC	2020	1624	NORTHERN BUSINESS INTELLIGENCE	CA	B3B 0K4	DARTMOUTH	201-26 AKERLEY BLVD	NS	CAD	101,923.59
HRWC	2020	239	OMNITECH INCORPORATED	CA	B3B 1J4	DARTMOUTH	10 AKERLEY BLVD., STE 1	NS	CAD	101,800.89
HRWC	2020	385	SNC LAVALIN OPERATIONS AND MAI	CA	B3J 3R4	HALIFAX	5657 SPRING GARDEN ROAD, STE 200	NS	CAD	98,041.85
HRWC	2020	3052	BLUEJACK CONSULTING INC.	CA	B3J 0G7	UPPER TANTALLON	152 FALCOURT RUN	NS	CAD	98,034.63
HRWC	2020	902	TOTAL FALL PROTECTION	CA	B2W 3C8	DARTMOUTH		NS	CAD	96,157.96
HRWC	2020	965	ADVANCED ENERGY MANAGEMENT LTD	CA	B3B 0B1	DARTMOUTH	60 DOREY AVE, SUITE 103	NS	CAD	95,629.62
HRWC	2020	1665	MARITIME PRESSURE WORKS LTD	CA	B2Y 4K3	DARTMOUTH	41 ESTATES ROAD	NS	CAD	93,620.36
HRWC	2020	1267	WAJAX INDUSTRIAL COMPONENTS	CA	H8T 2Y3	LACHINA	2200 52nd AVENUE	QC	CAD	93,598.44
HRWC	2020	818	ST. JOSEPH PRINT GROUP INC	CA	K1G 6S1	OTTAWA	1165 KENASTON RD	ON	CAD	92,468.63
HRWC	2020	3439	STRONGCO CORPORATION	CA	L4W 4Z4	MISSISSAUGA	1640 ENTERPRISE RD	ON	CAD	92,152.11
HRWC	2020	223	REXEL CANADA ELECTRICAL INC.-A	CA	B3B 1X2	BURNSIDE		NS	CAD	90,768.41
HRWC	2020	94	BELL ALIANT	CA	E2L 4K2	SAINT JOHN		NB	CAD	90,726.67
HRWC	2020	2326	HR ATLANTIC	CA	C1A 4I6	CHARLOTTETOWN	20 GREAT GEORGE ST UNIT 201	PE	CAD	90,285.40
HRWC	2020	3570	RAFTELIS	US	28202	Charlotte	227 W Trade St	NC	CAD	88,543.50
HRWC	2020	3653	NOXON (WIRES)	SE	43903	Fjaras	Fjaras Industrivag 19		CAD	86,685.00
HRWC	2020	537	CANSEL WADE	CA	B3B 1L3	DARTMOUTH	100 ISLEY AVE - UNIT C AND D	NS	CAD	85,968.72
HRWC	2020	424	FRED M. DUNPHY EXCAVATING	CA	B2Z 1B3	WESTPHAL	237 LAKE MAJOR ROAD	NS	CAD	81,586.27
HRWC	2020	3464	G6N CONSULTING GROUP INC	CA	B4B 2B7	HAMMONDS PLAINS	19 REINING WAY	NS	CAD	80,905.75
HRWC	2020	3532	CLOUD MANAGED NETWORKS	CA	L4S 0B8	RICHMOND HILL	30 VIA RENZO DRIVE #200	ON	CAD	79,822.47
HRWC	2020	2802	SFC ENERGY LTD	CA	T2C 5C2	CALGARY	10509 46 STREET SE	AB	CAD	75,119.17
HRWC	2020	2701	FRONTLINE TRAFFIC	CA	B3G 1M7	EASTERN PASSAGE		NS	CAD	74,791.27
HRWC	2020	3120	OPIN SOFTWARE INC.	CA	K1R 5T5	OTTAWA	320 CATHERINE ST, SUITE 2	ON	CAD	74,750.00
HRWC	2020	2598	GM BLUEPLAN ENGINEERING LIMITE	CA	N1K 1B8	GUELPH	650 WOODLAWN ROAD WEST, BLOCK C, UN	ON	CAD	73,286.64
HRWC	2020	1281	HERCULES SLR INC	CA	B3B 1B3	DARTMOUTH	520 WINDMILL ROAD	NS	CAD	73,197.93
HRWC	2020	371	XEROX CANADA LTD.	CA	M4W 3H1	TORONTO	33 BLOOR STREET EAST	ON	CAD	71,351.53
HRWC	2020	1344	BROOKFIELD CONCRETE PRODUCTS L	CA	B0N 1C0	BROOKFIELD		NS	CAD	70,869.26
HRWC	2020	1273	POOLCORP / SCP DISTRIBUTORS IN	CA	B4B 1J3	BEDFORD	380 BLUEWATER ROAD	NS	CAD	70,738.29
HRWC	2020	414	BEVLO PRODUCTS INC.	CA	B3E 1H4	PORTERS LAKE	2 THIS STREET	NS	CAD	70,537.70
HRWC	2020	184	WORK AUTHORITY	CA	M5W 1P8	TORONTO		ON	CAD	67,989.06
HRWC	2020	2485	PRIORITY WATER LTD	CA	B4E 3G1	MIDDLE SACKVILLE	1272 SACKVILLE DR	NS	CAD	64,410.00
HRWC	2020	522	GRANT THORNTON	CA	B3J 0E9	HALIFAX	1675 GRAFTON ST, SUITE 1001	NS	CAD	64,145.51
HRWC	2020	3042	CLEANEARTH INDUSTRIAL	CA	B3B 1C5	DARTMOUTH	20 MACDONALD AVENUE	NS	CAD	62,921.52
HRWC	2020	97	GRAYBAR CANADA LTD	CA	B3K 5M7	HALIFAX		NS	CAD	60,560.17
HRWC	2020	1929	BEDFORD READY MIX LTD	CA	E2K 5L6	SAINT JOHN	400 CHESLEY DRIVE	NB	CAD	60,487.08

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CoCd	Recon acct	Vendor	Name 1	Country	PostalCode	City	Street	Rg	Crcy	Purchasing
HRWC	2020	1351	GCR TIRE CENTRES	CA	L5R 3G5	MISSISSAUGA	5770 HURONTARIO STREET, SUITE 400	ON	CAD	57,440.36
HRWC	2020	1303	EASTERN ALTERNATIVE POWER SYST	CA	B3B 1S4	DARTMOUTH	N-21 LISLEY AVE	NS	CAD	57,069.99
HRWC	2020	1258	TEAK TREE ENTERPRISES	CA	B4C 4C9	LAKEVIEW	229 THIR D AVENUE	NS	CAD	56,016.50
HRWC	2020	3571	ARCADIS	US					CAD	55,495.28
HRWC	2020	341	ANIXTER CANADA INC	CA	H2Y 3E9	MONTREAL	PO BOX 144 SUCCERSALE PLACE	QC	CAD	54,746.99
HRWC	2020	497	MERCER HUMAN RESOURCE	CA	B3J 3N4	HALIFAX	1801 HOLLIS ST., STE 1300	NS	CAD	54,638.13
HRWC	2020	1348	TRIHEDRAL ENGINEERING LTD	CA	B4A 1C1	BEDFORD	1160 BEDFORD HWY., SUITE 400	NS	CAD	54,180.60
HRWC	2020	2912	MAPDEV TECHNOLOGY SOLUTIONS IN	CA	B4C 4A2	LOWER SACKVILLE	100 STONE MOUNT DR	NS	CAD	54,025.77
HRWC	2020	2624	EFP TECHNICAL SOLUTIONS INC.	CA	B3B 1N7	DARTMOUTH	97 SIMMONDS DR, BURNSIDE IND PRK	NS	CAD	53,473.79
HRWC	2020	586	BIRD STAIRS	CA	B3B 0C9	DARTMOUTH	102 JOHN SAVAGE AVENUE	NS	CAD	52,716.17
HRWC	2020	833	CME-CANADIAN MARITIME ENGINEER	CA	B3B 1S3	DARTMOUTH	90 THORNHILL DRIVE	NS	CAD	52,538.99
HRWC	2020	1762	STONHARD DIVISION, RPM CANANDA	CA	L1N 9C9	WHITBY	95 SUNRAY STREET	ON	CAD	52,191.60
HRWC	2020	2205	SOFTCHOICE LP	CA	L6M 2W1	OAKVILLE	105-1175 NORTH SERVICE RD WEST	ON	CAD	51,893.75
HRWC	2020	443	LIVINGSTON INTERNATIONAL	CA	H4T 2B5	St. Laurent,Bureau 300	6700 chemin de la Coste-de-Liesse	QC	CAD	51,611.86
HRWC	2020	1135	FADER AGENCIES	CA	B3B 1L6	DARTMOUTH	30 TOPPLE DR	NS	CAD	51,468.60
HRWC	2020	3216	ADESSO PROJECT MANAGEMENT	CA	B3J 2A4	HALIFAX	1725 BARRINGTON ST, SUITE 300	NS	CAD	50,955.72
HRWC	2020	1928	KNIGHTSBRIDGE ROBERTSON SURRET	CA	B3J 3T2	HALIFAX	5475 SPRING GARDEN ROAD, 6TH FLOOR	NS	CAD	50,600.01
HRWC	2020	144	MINISTER OF FINANCE	CA	B3J 2T9	HALIFAX	PO BOX 698	NS	CAD	50,595.01
HRWC	2020	1683	STRUM ENVIRONMENTAL	CA	B4A 1C5	BEDFORD	1355 BEDFORD HIGHWAY	NS	CAD	50,045.22
HRWC	2020	1261	WAJAX POWER SYSTEMS	CA	G1X 3W1	QUEBEC	2997 RUE WATT	QC	CAD	50,011.78
HRWC	2020	2272	WALLACE CONSTRUCTION SPECIALTI	CA	S7K 1T6	SASKATOON	825 MACKAY ST	SK	CAD	49,784.39
HRWC	2020	1767	CTS CONTAINER & TRAILER SERVIC	CA	B3B 1C6	DARTMOUTH	33 MACDONALD AVENUE	NS	CAD	49,701.85
HRWC	2020	348	EASTERN FENCE ERECTORS LTD.	CA	B3B 0J5	DARTMOUTH	145 CUTLER AVENUE	NS	CAD	49,360.76
HRWC	2020	1211	CUMMINS CANADA ULC	CA	H9R 1C2	POINT CLAIRE	7200 TRANS CANADA HWY	QC	CAD	47,604.44
HRWC	2020	2045	KEMTAG ENTERPRISES LTD	CA	E1B 4T9	RIVERVIEW		NB	CAD	47,593.90
HRWC	2020	1469	MICHELIN NORTH AMERICA(CANADA)	CA	H3C 6P4	MONTREAL	P O BOX 11725, SUCCURSALE CENTRE-VI	QC	CAD	47,549.37
HRWC	2020	569	COASTAL CONTROLS & INSTRUMENT	CA	B4A 2Z5	BEDFORD	20 DUKE STREET, UNIT 107	NS	CAD	47,345.68
HRWC	2020	158	OVERHEAD DOOR OF NS LTD.	CA	B3A 1H6	DARTMOUTH	328 WINDMILL ROAD	NS	CAD	46,575.00
HRWC	2020	3401	HOMEWOOD HEALTH INC	CA	V6E 3S7	VANCOUVER	1050 WEST PENDER ST, SUITE 500	BC	CAD	46,454.40
HRWC	2020	162	STRUM ENGINEERING ASSOC LTD	CA	B3B 1Y6	DARTMOUTH	80 EILEEN STUBBS AVE.	NS	CAD	44,573.56
HRWC	2020	2033	WESTECH ENGINEERING INC	US	84165-0068	SALT LAKE CITY		UT	CAD	44,194.97
HRWC	2020	3684	ASHANTI LEADERSHIP AND PROFESS	CA	B3M 3Y7	HALIFAX	103 287 LACEWOOD DR - SUITE 181	NS	CAD	43,687.35
HRWC	2020	500	SGS CANADA INC.	CA	M5W 4W2	TORONTO	PO BOX 4580, DEPT 5, STN A	ON	CAD	43,014.38
HRWC	2020	102	MARSH ADJUSTMENT BUREAU LTD.	CA	B4A 1E6	BEDFORD	1550 BEDFORD HWY., STE 711	NS	CAD	42,914.48
HRWC	2020	3620	EXCELITR	CA	K1P 5N4	OTTAWA	102 BANK STREET, SUITE 300	ON	CAD	42,061.25
HRWC	2020	3553	DIRECT EQUIPMENT LTD	CA	L6J 7T5	OAKVILLE	1363 CORNWALL RD	ON	CAD	41,866.50
HRWC	2020	2592	SEASCAPE BUILDING MAINTENANCE	CA		MIDDLE SACKVILLE	515 LUCASVILLE ROAD UNIT 101	NS	CAD	41,825.50
HRWC	2020	1827	EAST COAST INTERNATIONAL TRUCK	CA	E1H 2R5	MONCTON	100 UROUHART AVE	NB	CAD	41,213.00
HRWC	2020	455	AECOM CANADA LIMITED	CA	L3T 7W3	MARKHAM	105 COMMERCE VALLEY DRIVE WEST	ON	CAD	41,132.91
HRWC	2110	451	HALIFAX REGIONAL MUNICIPALITY	CA	B3J 3Y8	HALIFAX	1841 ARGYLE ST.,CITY HALL, 4TH FLO	NS	CAD	40,968.00
HRWC	2020	1367	FLOWSTAR INDUSTRIAL INC	CA	B2N 5Z5	TRURO		NS	CAD	40,577.71
HRWC	2020	3079	CANADIAN WATER NETWORK	CA	N2L 3G1	WATERLOO	200 UNIVERSITY AVE WEST	ON	CAD	40,000.00
HRWC	2020	1666	KROWN RUST CONTROL SYSTEMS	CA	B3K 4P3	HALIFAX	2823 ROBIE STREET	NS	CAD	39,518.55
HRWC	2020	1169	IMAGINIT CANADA	CA	L5W 1Y5	MISSISSAUGA	151 COURTNEYPARK DR. WEST STE. 201	ON	CAD	39,144.41
HRWC	2020	284	NOVA COMMUNICATIONS	CA	B3B 0J5	DARTMOUTH	89 CUTLER AVE, UNIT 104	NS	CAD	38,967.02
HRWC	2020	93	THE HALIFAX HERALD LTD.	CA	B3J 2T2	HALIFAX		NS	CAD	38,594.84
HRWC	2020	2292	SEPEX.COM	US	44193	CLEVELAND	PO BOX 951454	OH	CAD	38,245.75
HRWC	2020	2608	CDW CANADA INC	CA	M5W 5M5	TORONTO	POSTAL STATION A	ON	CAD	37,857.52
HRWC	2020	1172	BDI A DIVISION OF BELL MOBILIT	CA	M9C 0A8	ETOBICOKE	PO A	ON	CAD	37,666.06
HRWC	2020	3413	C3 WATER INC	CA	N0B 1M0	BRESLAU	350 WOOLWICH STREET SOUTH	ON	CAD	37,573.78
HRWC	2020	3167	ATLAS COPCO COMPRESSORS CANADA	CA	H4R 2P1	SAINT LAURENT	5060 LEVY	QC	CAD	37,570.44
HRWC	2020	3559	SURVIVAL SYSTEMS TRAINING LTD	CA	B2Y 4R9	DARTMOUTH	40 MOUNT HOPE AVE	NS	CAD	37,432.50
HRWC	2020	2876	Nintex	US	98004	Bellevue	10800 NE 8th Street Suite 400	WA	CAD	36,939.00
HRWC	2020	1596	WESTECH INDUSTRIAL LTD	CA	T2H 1Z6	CALGARY	5636 BURBANK CRESCENT SE	AB	CAD	36,712.60
HRWC	2020	3551	ICINFRASTRUCTURE CORPORATION	CA	V4T 2E9	WEST KELOWNA	2475 DOBBIN ROAD UNIT 22-517	BC	CAD	36,645.00
HRWC	2020	1585	WHITE CAP SUPPLY/BRAFASCO	CA	L4L 0B9	VAUGHAN	100 GALCAT DR	ON	CAD	36,274.45
HRWC	2020	3498	COOPER EQUIPMENT RENTALS LTD	CA	L5W 0G7	MISSISSAUGA	255 LONGSIDE DR UNIT 103	ON	CAD	36,006.57
HRWC	2020	3148	CITY CENTRE PROPERTY MANAGEMEN	CA	B3M 0J9	HALIFAX	300-50 BEDFORD HIGHWAY	NS	CAD	35,997.78
HRWC	2020	3262	GEMTEC CONSULTING ENGINEERS &	CA	E3C 2E6	FREDERICTON	121 DOAK RD	NB	CAD	35,945.56
HRWC	2020	1365	MARITIME HOSE SPECIALTIES	CA	L5T 1V1	MISSISSAUGA	7945 PACIFIC CIRCLE	ON	CAD	35,745.41
HRWC	2020	3252	INFO-EXCAVATION	CA	H3M 3E2	MONTREAL	1600 BOUL-HENRI-BOURASSA O	QC	CAD	35,701.70
HRWC	2020	292	VWR INTERNATIONAL, CO	CA	L5N 5Z7	MISSISSAUGA	2360 ARGENTIA RD	ON	CAD	35,549.64
HRWC	2020	1402	WURTH CANADA LTD	CA	N1C 0A1	GUELPH	345 HANLON CREEK BOULEVARD	ON	CAD	35,001.60
HRWC	2020	245	SACKVILLE CONCRETE LTD.	CA	B4C 3Z2	LR. SACKVILLE	17 ESTATE DRIVE	NS	CAD	34,923.85
HRWC	2020	149	KENT BUILDING SUPPLIES	CA	E2L 4G7	SAINT JOHN		NB	CAD	34,822.14
HRWC	2020	2733	EC ARMITAGE HARDWARE	CA	B3K 2E9	HALIFAX	5655 STANLY ST	NS	CAD	34,713.13
HRWC	2020	181	PARTS FOR TRUCKS INC.	CA	B3B 1C6	DARTMOUTH	15 MACDONALD AVE.	NS	CAD	34,586.37
HRWC	2020	3435	EXCALIBUR DATA SYSTEMS CORP	CA	E2M 5S8	LANCASTER	PO BOX 27068	NB	CAD	34,284.71
HRWC	2020	2933	C & D CLEANING & SECURITY SERV	CA	B3S 1A8	HALIFAX	106 CHAIN LAKE DR, UNIT 2A	NS	CAD	34,271.15
HRWC	2020	335	RECEIVER GENERAL FOR CANADA	CA	K1P 6K1	OTTAWA		ON	CAD	33,943.26
HRWC	2020	3203	NOVATE SYSTEMS INC.	CA	B3B 1P7	DARTMOUTH	900 WINDMILL RD, UNIT 107B	NS	CAD	33,792.75
HRWC	2020	1185	EATON INDUSTRIES (CANADA) COMP	CA	K1B 5N2	OTTAWA	2615 LANCASTER ROAD, UNIT 6	ON	CAD	33,453.50
HRWC	2020	2302	A-PLUS ROOFING & MASONRY LTD	CA	B4C 1R9	LOWER SACKVILLE	186 SKYRIDGE AVE	NS	CAD	33,097.00
HRWC	2020	2098	WILL-KARE PAVING & CONTRACTING	CA	B2N 5E5	TRURO	95 LOWER TRURO RD, BOX 651	NS	CAD	32,937.38
HRWC	2020	173	QUALITY CONCRETE	CA	B3B 1C5	DARTMOUTH	20 MACDONALD AVENUE	NS	CAD	32,683.74
HRWC	2020	1428	KENTAIN PRODUCTS LTD	CA	N2K 2Z4	KITCHENER	55 HOWARD PLACE	ON	CAD	32,194.25
HRWC	2020	1306	STRESCON LIMITED	CA	E2K 5L6	SAINT JOHN	400 CHESLEY DRIVE	NB	CAD	31,964.25
HRWC	2020	1629	HAYWARD GORDON LTD.	CA	L7G 0A3	HALTON HILLS	5 BRIDGEN GATE	ON	CAD	31,895.24
HRWC	2020	1862	ULINE	CA	L6Y 0N3	BRAMPTON	60 HEREFORD STREET	ON	CAD	31,706.54
HRWC	2020	1630	CANADIAN BEARINGS LTD	CA	L5S 155	MISSISSAUGA	1600 DREW RD	ON	CAD	31,518.30
HRWC	2020	3050	Innovyze	US	91016	Monrovia	605 East Huntington Dr., Suite 205	CA	CAD	31,438.07
HRWC	2020	3469	DILIGENT CANADA INC	CA	H3B 4W5	MONTREAL	1000 DE LA GAUCHETIERE WEST, 24TH F	QC	CAD	31,089.58
HRWC	2020	1908	KGP CO. (FORMERLY HUTTON COMM	CA	L4W 2R4	MISSISSAUGA	5228 EVEREST DR	ON	CAD	30,278.50
HRWC	2020	3560	PROGRESS	US	1730	BEDFORD	14 OAK PARK DR	MA	CAD	30,086.79
HRWC	2020	3387	FLOTTWEG SEPARATION TECHNOLOGY	US	41051	INDEPENDENCE	10700 TOEBBEN DRIVE	KY	CAD	29,925.89
HRWC	2020	2202	PMC INC	US	21204	TOWSON	110 WEST RD, SUITE 213	MD	CAD	29,349.35

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CoCd	Recon acct	Vendor	Name 1	Country	PostalCode	City	Street	Rg	Crcy	Purchasing
HRWC	2020	3192	KORN FERRY HAY GROUP LTD.	CA	M5J 2T3	TORONTO	181 BAY ST, SUITE 3810	ON	CAD	28,980.00
HRWC	2020	654	LONGSTAFF-PARKER-WAMBOLDT SURV	CA	B2W 3Y6	DARTMOUTH	73 TACOMA DRIVE - SUITE 807	NS	CAD	28,750.00
HRWC	2020	3409	SHORELINE LUBE DISTRIBUTION IN	CA	E4P 7M7	GRAND BARACHOIS	55 RAYMEL ROAD	NB	CAD	28,393.09
HRWC	2020	2906	CORRPRO CANADA INC.	CA	H9P 1G9	DORVAL	1985 55TH AVENUE	QC	CAD	28,177.88
HRWC	2020	1263	ROMA WELDING & MAINTENANCE LTD	CA	B3E 1K5	PORTERS LAKE	442 WEST PORTERS LAKE ROAD	NS	CAD	27,914.66
HRWC	2020	3612	GARLAND CANADA INC	CA	M9W 5Y8	ETOBICOKE	209 CARRIER DRIVE	ON	CAD	27,536.75
HRWC	2020	2884	KENT HOMES	CA	E2L 4M3	SAINT JOHN		NB	CAD	27,517.20
HRWC	2020	2920	LUMEN DIVISION OF SONEPAR CANA	CA	H2Y 1L6	MONTREAL	119 SAINT-JACQUES ST	QC	CAD	26,946.72
HRWC	2020	2493	INDEPENDENT SECURITY SERVICES	CA	B3M 3Y7	HALIFAX	287 LACEWOOD DR, UNIT 103, SUITE 14	NS	CAD	26,559.93
HRWC	2020	3614	GW ASPHALT PAVING LIMITED	CA	B2Z 2T6	COLE HARBOUR	1729 COLE HARBOUR RD	NS	CAD	26,243.00
HRWC	2020	2983	ERGOCENTRIC SEATING SYSTEMS IN	CA	L5T 2L6	MISSISSAUGA	275 SUPERIOR BLVD UNIT 2	ON	CAD	26,150.14
HRWC	2020	728	MMP OFFICE INTERIORS INC.	CA	B3B 1B8	DARTMOUTH	656 WINDMILL ROAD	NS	CAD	25,746.69
HRWC	2020	3627	SALTWIRE NETWORK	CA	A1B 3T7	ST. JOHNS	36 AUSTIN ST	NL	CAD	24,786.80
HRWC	2020	2939	KSB PUMPS INC.	CA	L4W 8G2	MISSISSAUGA	5205 TOMKEN ROAD	ON	CAD	24,494.60
HRWC	2020	1450	COX & PALMER	CA	B3J 3E5	HALIFAX	1959 UPPER WATER STREET	NS	CAD	24,378.62
HRWC	2020	2203	GALVANIC APPLIED SCIENCES USA	US	1851	LOWELL	41 WELLMAN STREET	MA	CAD	24,347.04
HRWC	2020	2361	PREDICTIVE SUCCESS CORPORATION	CA	L1N 1X3	WHITBY	316 COLBORNE ST WEST	ON	CAD	24,029.25
HRWC	2020	1196	PORT OF HALIFAX	CA	B3J 2P6	HALIFAX		NS	CAD	23,916.18
HRWC	2020	1467	ADVOCATE PRINTING & PUBL. CO. L	CA	B0K 1H0	PICTOU	181 BROWNS POINT RD	NS	CAD	23,680.97
HRWC	2020	886	WAJAX EQUIPMENT	CA	T7X 5A3	ACHESON	#30 26313 TWP 531A	AB	CAD	23,292.62
HRWC	2020	2597	ATLANTEK COMPUTER POWER SOLUTI	CA	B3B 1R3	DARTMOUTH	14-24 SIMMONDS DR	NS	CAD	23,248.98
HRWC	2020	1321	BLUEWAVE ENERGY INC (ULTRAMAR)	CA	B3J 0A5	DARTMOUTH	P O BOX 728, STN CENTRAL	NS	CAD	23,016.81
HRWC	2020	494	NGUYEN TECHNOLOGIES & ELECTRIC	CA	B3A 1H8	DARTMOUTH	339 WINDMILL ROAD	NS	CAD	22,904.16
HRWC	2020	3658	WOOD ENVIRONMENT & INFRASTRUCT	CA	T2E 7T8	CALGARY	401-1925 18TH AVENUE NE	AB	CAD	22,826.67
HRWC	2020	1505	DUERDEN&KEANE ENVIRONMENTAL IN	CA	B3A 2M3	DARTMOUTH	26 FOREST ROAD	NS	CAD	22,770.00
HRWC	2020	3655	STINGRAY RADIO INC	CA	B3B 1W8	DARTMOUTH	208-3 SPECTACLE LAKE DR	NS	CAD	22,770.00
HRWC	2020	977	UNDERGROUND CONSULTING SERVICE	CA	B3A 3H7	DARTMOUTH	12 GRAHAM STREET	NS	CAD	22,737.11
HRWC	2020	2526	ST. GEORGE'S TENNIS CLUB	CA	B2Y 3Y5	DARTMOUTH	PO BOX 422 DARTMOUTH MAIN	NS	CAD	22,702.48
HRWC	2020	281	J & M MURPHY LTD.	CA	B3L 4H7	HALIFAX	3514 JOSEPH HOWE DRIVE	NS	CAD	22,349.60
HRWC	2020	3664	VTGROUP SOLUTION INC	CA	R3T 2A7	WINNIPEG	205-1200 PEMBINA HIGHWAY	MB	CAD	22,010.10
HRWC	2020	1238	PITNEY WORKS	CA	L9W 2Z7	ORANGEVILLE		ON	CAD	21,854.38
HRWC	2020	2662	ENVIROSPHERE CONSULTANTS LTD.	CA		NEWPORT		NS	CAD	21,851.45
HRWC	2020	3606	NEXOM INC	CA		NAVIN	5 BURKS WAY	MB	CAD	21,620.00
HRWC	2020	659	XL ELECTRIC LIMITED	CA	B3B 1K3	DARTMOUTH	4 WADELLE AVENUE	NS	CAD	21,577.24
HRWC	2020	3054	CORPORATE EXPRESS CANADA INC	CA	B3B 2E5	DARTMOUTH	2 ROYLES AVENUE	NS	CAD	21,162.23
HRWC	2020	2288	VAN HOUTTE COFFEE SERVICES INC	CA	H1Z 4J9	MONTREAL	8215 17TH AVENUE	QC	CAD	21,093.35
HRWC	2020	630	ATLANTIC CRANE & MAT. HANDLING	CA	B3B 1V6	DARTMOUTH	49 TRIDER CRES	NS	CAD	20,814.21
HRWC	2020	2676	BLUE WATER AGENCIES LIMITED	CA	B3B 1L6	DARTMOUTH	40 TOPPLE DR	NS	CAD	20,630.61
HRWC	2020	2971	INDUSTRIAL ALLIANCE	CA	B2B 1Y2	DARTMOUTH	238 BROWNLOW AVE, SUITE 320	NS	CAD	20,355.22
HRWC	2020	3119	ILLER DOOR SYSTEMS LTD.	CA	B6L 1X2	TRURO	159 TRURO HEIGHTS RD	NS	CAD	20,343.97
HRWC	2020	772	CORROSION SERVICE CO. LTD.	CA	L6C 3A1	MARKHAM	280 HILLMOUNT ROAD, UNIT 9	ON	CAD	20,060.20
HRWC	2020	3130	HATCH CORPORATION	CA	B3J 3K8	HALIFAX	1809 BARRINGTON ST, SUITE 1009	NS	CAD	20,041.07
HRWC	2020	1754	JAVELIN CONSTRUCTION LTD	CA	B3A 1H3	DARTMOUTH	311 WINDMILL ROAD	NS	CAD	19,785.75
HRWC	2020	2142	KILDOON INTELECTION INC	CA	B3P 2H5	HALIFAX	9 MELVIN RD	NS	CAD	19,785.75
HRWC	2020	3602	HIGHLAND GEOMATICS & ENGINEERI	CA	B4C 2R3	LOWER SACKVILLE	153 SACKVILLE DR, SUITE 1	NS	CAD	19,550.00
HRWC	2020	3641	METRO ROOFING	CA	B3B 1R7	DARTMOUTH	95 AKERLEY BLVD - UNIT 110	NS	CAD	19,406.25
HRWC	2020	2846	MAXWELL PROMOTIONAL PRODUCTS	CA	B3M 3Y7	HALIFAX	287 LACEWOOD DRIVE UNIT 103-273	NS	CAD	19,212.36
HRWC	2020	3527	MITACS INC	CA	V6T 1Z3	VANCOUVER	6190 AGRONOMY RD, SUITE 301	BC	CAD	19,166.67
HRWC	2020	3546	XPLORENET COMMUNICATIONS	CA	E7M 6B5	WOODSTOCK	300 LOCKHART MILL RD, PO BOX 9060	NB	CAD	19,090.00
HRWC	2020	3611	SMITH + ANDERSEN CONSULTING EN	CA	B3J 3R7	HALIFAX	1969 UPPER WATER STREET - SUITE 190	NS	CAD	18,709.36
HRWC	2020	1410	HSE INTEGRATED LTD	CA	B3B 1L5	DARTMOUTH	95 ILSLEY AVENUE	NS	CAD	18,474.75
HRWC	2020	486	ATLANTIC BACKFLOW SPECIALISTS	CA	B2W 3K6	DARTMOUTH	65 MT. EDWARD ROAD	NS	CAD	18,374.05
HRWC	2020	376	RAE INDUSTRIAL ELECTRONICS LTD	CA	B3B 1M2	DARTMOUTH	11 MORRIS DR., SUITE 103	NS	CAD	18,113.58
HRWC	2020	2506	LOFTY PERCH INC	CA	L3R 5V6	MARKHAM	15-505 HOOD RD	ON	CAD	18,112.50
HRWC	2020	3146	NETWRIX	US	43017	DUBLIN	565 METRO PLACE	OH	CAD	18,028.79
HRWC	2020	185	SERVANT, DUNBRACK, MCKENZIE &	CA	B3S 1C6	HALIFAX	36 OLAND CRESCENT	NS	CAD	17,869.85
HRWC	2020	334	HETEK SOLUTIONS INC.	CA	T5J 3P4	EDMONTON	10250 101 STREET NW	AB	CAD	17,653.10
HRWC	2020	2120	JAMES LEGGATE FORESTRY	CA	B0N 2L0	UPPER KENNEDYCOOK	6079 HIGHWAY 236 - RR #1	NS	CAD	17,618.00
HRWC	2020	429	SSQ INSURANCE COMPANY INC	CA	H3A 2A5	MONTREAL	200 UNIVERSITY AVE, SUITE 1800	QC	CAD	17,415.45
HRWC	2020	1996	WOOD WYANT	CA	B3B 1C9	DARTMOUTH	27 FIDING AVENUE	NS	CAD	17,353.16
HRWC	2020	849	BRANDT TRACTOR LTD.	CA	S4P 3R8	REGINA	HWY1 EAST BOX 3856	SK	CAD	17,312.01
HRWC	2020	1288	THE SHAW GROUP LIMITED	CA	B2S 1M9	LANTZ	1101 HIGHWAY #2	NS	CAD	17,161.40
HRWC	2020	1352	PARKWAY AUTOMOTIVE SERVICES LT	CA	B2W 3T7	DARTMOUTH	676 MAIN STREET	NS	CAD	17,148.45
HRWC	2020	835	PACE PLUMBING & HEATING	CA	B3P 2C8	HALIFAX	34 WINCHESTER AVENUE	NS	CAD	17,139.25
HRWC	2020	3670	VALENCIA IIP ADVISORS LIMITED	CA	K1Y 3B6	OTTAWA	1327A WELLINGTON ST W, STE 203	ON	CAD	16,950.00
HRWC	2020	3070	FRANKLIN COVEY	US	84119	SALT LAKE CITY	2200 W PARKWAY BLVD	UT	CAD	16,905.00
HRWC	2020	882	HEATHER BOUDREAU	CA	B4B 2B2	HAMMONDS PLAINS	28 HARNESS TRAIL	NS	CAD	16,219.98
HRWC	2020	2182	DAN-X RECYCLING LIMITED	CA	B3B 1R6	DARTMOUTH	64 TRIDER CRES	NS	CAD	16,213.72
HRWC	2020	2566	JC AUTOWORKS INCORPORATED	CA	B3V 1A3	HARRIETSFIELD	801 OLD SAMBRO ROAD	NS	CAD	16,085.28
HRWC	2020	617	SPRING WATER INC.	CA	B4C 4G3	LOWER SACKVILLE	17 MURDOCK MACKAY CRT, SUITE 101	NS	CAD	15,936.87
HRWC	2020	3601	PRAXES EMERGENCY SPECIALISTS I	CA	B3K 1Z7	HALIFAX	5539B YOUNG STREET	NS	CAD	15,778.00
HRWC	2020	2494	CROMER INDUSTRIES (1988) CORP.	CA	P2S 2W8	SEGUIN	160A HIGHWAY 141	ON	CAD	15,466.96
HRWC	2020	3648	EVEREST AUTOMATION INC	CA	G7A 1B3	LEVIS	1076A CHEMIN INDUSTRIEL	QC	CAD	15,351.36
HRWC	2020	1301	TRAILWALK HOLDINGS LTD	CA	B0N 2T0	WINDSOR	RR #1 391 WENTWORTH RD	NS	CAD	15,108.70
HRWC	2020	2600	JOHNSON CONTROLS	CA	B4A 2T3	BEDFORD	275 ROCKY LAKE DRIVE, SUITE 20	NS	CAD	14,868.53
HRWC	2020	1669	AINSWORTH INC	CA	M4A 1X4	TORONTO	131 BERMONDSEY ROAD	ON	CAD	14,834.15
HRWC	2020	2351	WESTOWER COMMUNICATIONS LTD.	CA	N3B 2Z2	ELMIRA	60 SOUTH FIELD DRIVE	ON	CAD	14,795.90
HRWC	2020	3682	KEVIN CORMIER MARBLE AND TILE	CA	B3R 0B6	HALIFAX	22 ANGLER DRIVE	NS	CAD	14,720.00
HRWC	2020	1915	HAZMASTERS INC.	CA	B3B 1S1	DARTMOUTH	60 THORNHILL DRIVE, UNIT 5	NS	CAD	14,706.25
HRWC	2020	1934	BRUNSWICK NEWS INC	CA	E1C 8P3	MONCTON	PO BOX 1001	NB	CAD	14,705.34
HRWC	2020	35	DON BRENTON'S	CA	B3T 1L7	LAKESIDE	2 LAKESIDE PARK DRIVE, UNIT 12	NS	CAD	14,700.44
HRWC	2020	199	TERRA NOVA LANDSCAPING LTD	CA	B4B 1J7	BEDFORD	130 BLUEWATER ROAD	NS	CAD	14,691.44
HRWC	2020	2339	UNIFORM WORKS LIMITED	CA	B3B 0J5	DARTMOUTH	89 CUTLER AVENUE, SUITE 104	NS	CAD	14,428.59
HRWC	2020	2280	DIESEL AND AUTO ELECTRIC LIMIT	CA	B3B 1N7	DARTMOUTH	105 SIMMONDS DRIVE BURNSIDE PARK	NS	CAD	14,339.10
HRWC	2020	3291	TTX CANADA INC	CA	N1T 1N6	CAMBRIDGE	150 WERLICH DR UNIT 5 & 6	ON	CAD	14,304.85
HRWC	2020	1009	COMMISSIONAIRES NOVA SCOTIA	CA	B3J 2Z1	HALIFAX		NS	CAD	14,105.90

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CoCd	Recon acct	Vendor	Name 1	Country	PostalCode	City	Street	Rg	Crcy	Purchasing
HRWC	2020	1103	RORY MACNEIL	CA	B3K 5M1	HALIFAX		NS	CAD	13,803.90
HRWC	2020	3557	THE PROCUREMENT LAW OFFICE	CA	M5V 3L5	TORONTO	781 KING ST WEST, SUITE 406	ON	CAD	13,800.00
HRWC	2020	2377	DAC INDUSTRIAL ENGINES	CA	B3B 126	DARTMOUTH	10 PAYZANT AVE	NS	CAD	13,672.04
HRWC	2020	2593	INTEGRATED PNEUMATICS LIMITED	CA	E2K 4B5	SAINT JOHN	22 ROCKY TERRACE	NB	CAD	13,638.37
HRWC	2020	3097	PINCHIN LTD.	CA	L5N 7W5	MISSISSAUGA	2470 MILLTOWER COURT	ON	CAD	13,595.62
HRWC	2020	2129	THE SALVATION ARMY	CA	B3K 3A9	HALIFAX	2044 GOTTINGEN ST	NS	CAD	13,505.50
HRWC	2020	3575	VOLCANO CONSTRUCTION SERVICES	CA	B3B 1E4	DARTMOUTH	36 FIELDING AVENUE	NS	CAD	13,455.00
HRWC	2020	1503	DRIVE PRODUCTS / OCEAN TRUCK E	CA	B3B 1M7	DARTMOUTH	141A JOSEPH ZATZMAN DRIVE	NS	CAD	13,407.64
HRWC	2020	2691	CONTRO VALVE	CA	J4Y 2R4	BROSSARD	9610B IGNACE	QC	CAD	13,269.85
HRWC	2020	3534	E SOURCE	US	80301	Boulder	1745 38th Street	CO	CAD	13,007.81
HRWC	2020	154	WATER FOR PEOPLE CANADA	CA	M2J 1R3	TORONTO	245 CONSUMERS ROAD, SUITE 400	ON	CAD	12,875.42
HRWC	2020	9	AWWA RESEARCH FOUNDATION	US	80235-3098	DENVER	6666 WEST QUINCY AVENUE	CO	CAD	12,688.71
HRWC	2020	3181	ROCKWELL AUTOMATION CANADA LTD	CA	M5W 1P8	TORONTO		ON	CAD	12,581.00
HRWC	2020	2927	BEIZONA ATLANTIC CANADA	CA	B3B 1H3	DARTMOUTH	70 WRIGHT AVE	NS	CAD	12,563.18
HRWC	2020	2590	ROSS VALVE MANUFACTURING CO	US	12181	TROY	79 102 ND STREET	NY	CAD	12,550.85
HRWC	2020	1330	STELLAR INDUSTRIAL SALES LTD	CA	B3B 1B3	DARTMOUTH	520 WINDMILL RD	NS	CAD	12,458.37
HRWC	2020	1705	CUSTOM PROTECT EAR INC.	CA	V3S 9E9	SURREY	#681-7789 134TH STREET	BC	CAD	11,996.64
HRWC	2020	3572	PHYTOXIGENE INC	US	44311	AKRON	526 SOUTH MAIN STREET	OH	CAD	11,976.47
HRWC	2020	1041	GLOBAL KNOWLEDGE NETWORK CANAD	CA	M4Y 3A5	TORONTO	2 BLOOR ST EAST 31ST FLOOR	ON	CAD	11,972.09
HRWC	2020	3555	BIRD MECHANICAL LTD	CA	L3Y 9C3	NEWMARKET	1201 NICHOLSON RD	ON	CAD	11,952.32
HRWC	2020	1164	NATIONAL LIFE SUPPORT	CA	B3M 4H4	HALIFAX		NS	CAD	11,781.00
HRWC	2020	2191	WIRE ROPE INDUSTRIES (ATLANTIC	CA	B3B 1S3	DARTMOUTH	84 THORNHILL DRIVE	NS	CAD	11,746.75
HRWC	2020	2164	EASYKLEEN PRESSURE SYSTEMS LTD	CA	E4E 2N8	SUSSEX	26 EVELEIGH ST	NB	CAD	11,721.66
HRWC	2020	3513	NATURAL FORCES SOLAR INC	CA	B3T 3N4	HALIFAX	1205-1801 HOLLIS ST	NS	CAD	11,720.23
HRWC	2020	641	UNITED RENTALS OF CANADA LTD.	CA	N2B 3G1	KITCHENER	36 CENTENNIAL ROAD	ON	CAD	11,666.91
HRWC	2020	446	ALL GLASS & UPHOLSTERY	CA	B3S 1C4	HALIFAX	55 MCQUADE LAKE CR	NS	CAD	11,624.20
HRWC	2020	3463	REFINED ROOFING	CA	B3K 3P8	HALIFAX	3675 ACADIA ST	NS	CAD	11,557.50
HRWC	2020	2397	LINKEDIN IRELAND	CA	M5E 0E9	TORONTO		ON	CAD	11,520.00
HRWC	2020	3619	RLS CONTRACTING LIMITED	CA	B4B 1E9	HAMMONDS PLAINS	34 CRESTFIELD DRIVE	NS	CAD	11,518.40
HRWC	2020	3568	JAMES HANNAN INC	CA	B3M 3B1	HALIFAX	12 KINGFISHER CRESCENT	NS	CAD	11,509.03
HRWC	2020	3044	FITTER INTERNATIONAL INC. (VA	CA	T2G 4M6	CALGARY	3050-2600 PORTLAND ST SE	AB	CAD	11,500.00
HRWC	2020	3287	3325398 NOVA SCOTIA LTD.	CA	B3K 4X8	HALIFAX	3770 KEMPT RD, SUITE 110	NS	CAD	11,500.00
HRWC	2020	3449	HALIFAX PARTNERSHIP	CA	B3J 0E9	HALIFAX	1675 GRAFTON ST - SUITE 701	NS	CAD	11,500.00
HRWC	2020	2829	CENTRIFUGES UNLIMITED INC.	CA	T2C 1P4	CALGARY	3504-64 AVENUE SE	AB	CAD	11,425.94
HRWC	2020	3292	EAST COAST MOBILE MEDICAL	CA	B3B 1S8	DARTMOUTH	101 ILSLEY AVE, SUITE 1	NS	CAD	11,413.75
HRWC	2020	588	OSISOFT, INC.	CA	H3B 3K9	MONTREAL		QC	CAD	11,374.07
HRWC	2020	398	SHIRLEY SAMPSON	CA	B2W 1H1	DARTMOUTH	63 EVERETTE STREET	NS	CAD	11,344.50
HRWC	2020	2764	WINCAN	US	15205	PITTSBURGH	300 CEDAR RIDGE DRIVE SUITE 308	PA	CAD	11,319.25
HRWC	2020	2504	FIRST RATE MACHINING LTD	CA	B3B 1L4	DARTMOUTH	31 RADDALL AVE - UNIT #3	NS	CAD	11,284.95
HRWC	2020	1542	FOWLER BAULD & MITCHELL	CA	B3J 1V7	HALIFAX	H51-1600 HOLLIS ST	NS	CAD	11,235.22
HRWC	2020	1863	E.B.M. TRUCK & TRAILER LIMITED	CA	B4C 3Z2	LOWER SACKVILLE	9 ESTATES ROAD	NS	CAD	11,193.01
HRWC	2020	44	TRANS WORLD DISTRIBUTING LTD.	CA	B3B 1K4	DARTMOUTH	9 WADDELL AVENUE	NS	CAD	11,065.44
HRWC	2020	440	ANSWER 365	CA	B3K 4E5	HALIFAX	2829 AGRICOLA STREET	NS	CAD	11,035.79
HRWC	2020	732	COASTAL RESTORATION & MASONRY	CA	B3T 1P3	GOODWOOD	8 MILLS DRIVE	NS	CAD	10,991.70
HRWC	2020	3490	SCOTIA TIRE - ANDY'S TIRE - A1	CA	B3T 1A1	LAKESIDE	12 DOMINION CRES	NS	CAD	10,979.57
HRWC	2020	3639	WILLSCOT	CA	M5W 0E9	TORONTO	C/O 911630 PO BOX 4090 STN A	ON	CAD	10,976.13
HRWC	2020	1984	MINISTER OF FINANCE	CA	B3B 1T3	DARTMOUTH	780 WINDMILL RD - 3RD FLOOR	NS	CAD	10,893.39
HRWC	2020	3681	KAL TIRE	CA	B3B 1W3	DARTMOUTH	42 ISNOR DR	NS	CAD	10,744.27
HRWC	2020	3451	PROAX TECHNOLOGIES LTD	CA	H7P 0C9	LAVAL	3505 JOHN PRATT STREET	QC	CAD	10,709.16
HRWC	2020	2954	THAUMAS ENVIRONMENTAL CONSULTA	CA	B2Y 4C8	DARTMOUTH	30 BECKFOOT DR	NS	CAD	10,698.46
HRWC	2020	3593	PALADIN SECURITY GROUP LTD	CA	V5G 4W3	BURNABY	201-3001 WAYBURN DRIVE	BC	CAD	10,687.81
HRWC	2020	511	STANHOPE SIMPSON INSURANCE LTD	CA	B3K 5M6	HALIFAX		NS	CAD	10,600.00
HRWC	2020	678	HURRICANE INDUSTRIAL EQUIPMENT	CA	B3B 1N4	DARTMOUTH	188 JOSEPH ZATZMAN DRIVE	NS	CAD	10,562.25
HRWC	2020	961	HODGSON TRUCKING LTD.	CA	B3G 1M4	EASTERN PASSAGE		NS	CAD	10,524.80
HRWC	2020	79	GUILDFORDS (2005) INC.	CA	B3B 0H5	DARTMOUTH	25 GUILDFORD AVENUE	NS	CAD	10,453.85
HRWC	2020	1773	STEEL 'N MOTION INC	CA	B3V 1B9	HALIFAX	1922 OLD SAMBRO ROAD	NS	CAD	10,334.33
HRWC	2020	3549	VACUTRUX LTD	CA	N3B 2A1	ELMIRA	20 MARTINS LANE	ON	CAD	10,319.30
HRWC	2020	1623	DOUG CLARKE AUTO BODY LTD	CA	B2R 1R9	WAVERLEY	2578 ROCKY LAKE DR	NS	CAD	10,183.91
HRWC	2020	1380	CANADAWIDE SCIENTIFIC LTD	CA	K1G 6B1	OTTAWA	2300 WALKLEY ROAD	ON	CAD	10,070.79
HRWC	2020	2760	BRAND SAFFWAY ACCESS INC	CA	N6M 1A1	LONDON	138 NEPTUNE CRESCENT UNIT 5	ON	CAD	10,062.75
HRWC	2020	876	DISCOVERY CENTRE	CA	B3J 3S8	HALIFAX	1215 LOWER WATER ST	NS	CAD	10,000.00
HRWC	2020	3394	BLACKBURN LAW	CA	B4A 3Y4	BEDFORD	1595 BEDFORD HIGHWAY, SUITE 231	NS	CAD	9,897.10
HRWC	2020	3533	PARK PLACE TECHNOLOGIES CANADA	CA	L4B 1E4	TORONTO	50 MURAL STREET	ON	CAD	9,544.00
HRWC	2020	1266	ALL-TECH ENVIROMENTAL SERVICE	CA	B4A 2Z5	BEDFORD	20 DUKE STREET, SUITE 109	NS	CAD	9,453.00
HRWC	2020	2661	PROPERTY VALUATION SERVICE COR	CA	B3B 2B4	DARTMOUTH	238A BROWNLOW AVE, SUITE 200	NS	CAD	9,417.12
HRWC	2020	3461	CUES CANADA INC	CA	L4W 1P9	MISSISSAUGA	2-1675 SISMET RD	ON	CAD	9,386.80
HRWC	2020	2710	PRINT 101 LTD	CA	B3K 5A8	HALIFAX	3667 STRAWBERRY HILL ST, UNIT 200	NS	CAD	9,341.19
HRWC	2020	1757	HARRIS INDUSTRIAL TESTING SERV	CA	B2R 1P4	WAVERLEY	21 OLD COBEQUID ROAD	NS	CAD	9,200.00
HRWC	2020	3631	FINISHCOAT PAINTING LTD	CA	B3R 1X3	HALIFAX	531 HERRING COVE RD	NS	CAD	9,188.50
HRWC	2020	234	SAFETY SERVICES OF N S	CA	B3B 1W2	DARTMOUTH	201 BROWNLOW AVENUE, UNIT 1	NS	CAD	8,970.00
HRWC	2020	1746	BDI CANADA INC	CA	L5T 1K2	MISSISSAUGA	6235 TOMKEN ROAD	ON	CAD	8,913.34
HRWC	2020	1416	SCHNEIDER ELECTRIC CANADA INC	CA	M4B 1Y2	TORONTO	19 WATERMAN AVENUE	ON	CAD	8,891.26
HRWC	2020	2844	SHAREGATE	CA	H3K 1G6	MONTREAL	1751 RICHARDSON ST, SUITE 5400	QC	CAD	8,883.24
HRWC	2020	1944	GALARDI ROTHSTEIN GROUP	US	60605	CHICAGO	740 S FEDERAL ST #1101	IL	CAD	8,625.07
HRWC	2020	1559	DOMINION DIVING	CA	B2Y 2W1	DARTMOUTH	7 CANAL STREET	NS	CAD	8,611.20
HRWC	2020	2673	TERRAPURE REVOLUTION ENVIRONME	CA	B3B 1W8	DARTMOUTH	3 SPECTACLE LAKE DRIVE, UNIT 290	NS	CAD	8,525.89
HRWC	2020	824	CONNORS DIVING SERVICES LTD.	CA	B3T 1L7	LAKESIDE	11-2 LAKESIDE PARK DRIVE	NS	CAD	8,326.29
HRWC	2020	2313	E.D. TECHNICAL SERVICES	CA	B0J 1J0	CHESTER	85 GRANITE ST	NS	CAD	8,325.43
HRWC	2020	2309	APPLIED INDUSTRIAL TECHNOLOGIE	CA	S7P 0A4	SASKATOON	143 WHEELER STREET	SK	CAD	8,306.53
HRWC	2020	3637	RADWELL	CA		STONEY CREEK	1100 SOUTH SERVICE RD #101	ON	CAD	8,283.58
HRWC	2020	140	DYMAXION RESEARCH LTD	CA	B3S 0H9	HALIFAX	107-145 HOBSONS LAKE DR	NS	CAD	8,243.89
HRWC	2020	3678	KOOLEQUIPMENT INC	CA	L9T 5X2	MILTON	237 LEDWITH DR	ON	CAD	8,198.10
HRWC	2020	3491	QUEST SOFTWARE CANADA INCORPOR	CA	M5A 4L5	TORONTO	260 KING STREET EAST	ON	CAD	8,182.87
HRWC	2020	2130	DINKA ENTERPRISES	CA	B2W 6E2	DARTMOUTH	PO BOX 28031 RPO TACOMA	NS	CAD	8,073.00
HRWC	2020	3438	TEAM INDUSTRIAL SERVICES	CA	A1L 0A7	ST JOHNS	149 MCNAMARA DR	NL	CAD	8,014.36
HRWC	2020	1847	VERONICS INSTRUMENTS INC	CA	L8E 0C5	STONEY CREEK	1100 SOUTH SERVICE RD, SUITE #114	ON	CAD	7,990.20


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
CoCd	Recon acct	Vendor	Name 1	Country	PostalCode	City	Street	Rg	Crcy	Purchasing
HRWC	2020	328	CTH INSTRUMENTS LTD.	CA	B3B 1J4	DARTMOUTH	10 AKERLEY BLVD., SUITE 36	NS	CAD	7,900.50
HRWC	2020	3576	COMPUGEN INC	CA	L4S 0B8	RICHMOND HILL	100 VIA RENZO DR	ON	CAD	7,834.95
HRWC	2020	1556	SVM SERVICES/ACE PEST CONTROL	CA	B3B 0M4	DARTMOUTH	204 BROWNLOW AVE, UNIT 155	NS	CAD	7,807.35
HRWC	2020	3582	KOOLTRONIC	US	8534	PENNINGTON	30 PENNINGTON-HOPEWELL ROAD	NJ	CAD	7,746.69
HRWC	2020	769	BENTLEY SYSTEMS INC.	CA	M5L1K1	TORONTO	PO BOX 3695 COMMERCE CRT POSTAL STA	ON	CAD	7,745.25
HRWC	2020	3337	MALVERN PANALYTICAL	CA	M5W 1C1	TORONTO		ON	CAD	7,699.25
HRWC	2020	3673	VX FACILITIES ENGINEERING LTD	CA	B2A 4S5	DARTMOUTH	99 WYSE ROAD	NS	CAD	7,613.00
HRWC	2020	449	THOMPSON CONN LTD.	CA	B3L 4P8	HALIFAX	6169 QUINPOOL ROAD	NS	CAD	7,561.25
HRWC	2020	2953	ZEROWATER	US	19053	Trevoise	7 Neshaminy Interplex, Suite 1116	PA	CAD	7,558.08
HRWC	2020	2708	ROYAL FLUSH	CA	B4C 4B1	LOWER SACKVILLE	69 COLONEL JOSEPH SCOTT DR	NS	CAD	7,478.05
HRWC	2020	2200	INDEPENDENT ARMORED TRANSPORT	CA	B3M 3Y7	HALIFAX	287 LACEWOOD DR (UNIT 103) SUITE 14	NS	CAD	7,438.43
HRWC	2020	381	CANADIAN WATER & WASTEWATER	CA	K1J 9H9	OTTAWA	1010 POLYTEK STREET, UNIT 11	ON	CAD	7,388.75
HRWC	2020	1721	COMPUTATIONAL HYDRAULICS INC	CA	N1H 4E9	GUELPH	147 WYNDHAM STREET NORTH	ON	CAD	7,360.00
HRWC	2020	2337	BERNIE VERGE	CA	B2S 3A9	EAST GORE	3308 HIGHWAY 202	NS	CAD	7,300.00
HRWC	2020	721	MINISTER OF FINANCE	CA	B3J 2P8	HALIFAX	PO BOX 442	NS	CAD	7,278.75
HRWC	2020	1409	HOSKIN SCIENTIFIC LTD	CA	L6L 0B1	OAKVILLE	5-3280 SOUTH SERVICE RD. W	ON	CAD	7,274.90
HRWC	2020	1171	MANULIFE FINANCIAL CANADIAN	CA	H3A 3A2	MONTREAL	1410-2000 MANSFIELD STREET	QC	CAD	7,245.74
HRWC	2020	1382	FILTRATION PLUS LTD	CA	B3B 0J6	DARTMOUTH	90 CUTLER AVENUE, UNIT 1	NS	CAD	7,163.15
HRWC	2020	3596	ST NICHOLAS ANGLICAN CHURCH	CA	B3Z 1H4	UPPER TANTALLON	29 WESTWOOD HILLS	NS	CAD	7,153.00
HRWC	2020	3515	SPRAY-NET PEI/NB	CA	C1A 4A9	CHARLOTTETOWN	600-97 QUEEN ST	PE	CAD	7,101.25
HRWC	2020	1573	SAFETY MADE EASY	CA	B2H 5W1	NEW GLASGOW	450 MOUNTAIN RD	NB	CAD	7,059.39
HRWC	2020	3141	LZG CONTRACTING	CA	B0N 1P0	KENNETCOOK	6060 HIGHWAY 354	NS	CAD	7,015.00
HRWC	2020	3125	UDENWA NNAMDI-HEI	CA	B3K 5M1	HALIFAX	450 COWIE HILL RD	NS	CAD	6,988.38
HRWC	2020	3607	MELT WATER NEWS CANADA, INC	CA	M5H 1J9	TORONTO	150 KING ST. W, FLOOR 7	ON	CAD	6,911.50
HRWC	2020	3609	PROCUREMENT ADVISORY OFFICE IN	CA	M5V 3I5	TORONTO	781 KING ST, W, SUITE 406	ON	CAD	6,900.00
HRWC	2020	1507	CARMICHAEL ENGINEERING LTD	CA	L4X 2G1	MISSISSAUGA	3146 LENWORTH DRIVE	ON	CAD	6,853.69
HRWC	2020	774	TROY LIFE & FIRE SAFETY LTD.	CA	N4K 2H7	OWEN SOUND	1042 2ND AVENUE, EAST	ON	CAD	6,841.57
HRWC	2020	3066	SCHOONER EXCAVATION LTD.	CA	B3T 1P3	GOODWOOD	8 MILLS DR	NS	CAD	6,785.00
HRWC	2020	1532	CRANE SUPPLY	CA	E1E 3X3	MONCTON	145 ENGLISH DR	NB	CAD	6,763.26
HRWC	2020	866	FISHER SCIENTIFIC	CA	M5W 0E9	TORONTO	C/O T915660, PO BOX 4090, STN A	ON	CAD	6,758.38
HRWC	2020	834	PETROMAX	CA	B3B 1E1	DARTMOUTH	16A FIELDING AVENUE	NS	CAD	6,722.80
HRWC	2020	3447	BRUNSWICK LIFT RENTALS	CA	B3B 1H3	DARTMOUTH	56 WRIGHT AVE	NS	CAD	6,699.35
HRWC	2020	3281	FENNELL & ASSOCIATES APPRAISER	CA	B3K 4X8	HALIFAX	3600 KEMPT RD, SUITE 209	NS	CAD	6,670.00
HRWC	2020	1699	OFFICE-TEC ATLANTIC LTD	CA	B3L 4T7	HALIFAX	PO BOX 22022, BAYERS RPO	NS	CAD	6,555.00
HRWC	2020	3518	EVOLVED METALWORK	CA	B3B 1R3	DARTMOUTH	24 SIMMONDS DR - UNIT 10	NS	CAD	6,532.00
HRWC	2020	2784	FASTENAL CANADA	CA	N2C 0B7	KITCHENER	900 WABANAKI DRIVE	ON	CAD	6,513.18
HRWC	2020	3403	KELLY PEREIRA	CA	B3K 5M1	HALIFAX	450 COWIE HIL RD	NS	CAD	6,405.56
HRWC	2020	1323	CABOT SHIPPING SUPPLIES	CA	B3B 1R7	DARTMOUTH	79 AKERLEY BLVD., UNIT P	NS	CAD	6,405.17
HRWC	2020	1174	KEMPTON APPRAISALS LIMITED	CA	B2Y 1K8	DARTMOUTH	376 PORTLAND STREET	NS	CAD	6,325.00
HRWC	2020	344	NS MAIN. ENFORCEMENT PROGRAM	CA	B3J 2V2	HALIFAX		NS	CAD	6,248.00
HRWC	2020	2717	BOOMER TECHNICAL RESOURCES LTD	CA	B3B 1R6	DARTMOUTH	34 TRIDER CRES	NS	CAD	6,164.00
HRWC	2020	3649	ATLANTIC STAINLESS SERVICES	CA	B4G 2S6	BEAVER BANK	3029 BEAVER BANK RD	NS	CAD	6,130.25
HRWC	2020	1578	GRATEC LIMITED	CA	L3K 4C5	CONCORD	30 RITIN LANE, UNIT 1	ON	CAD	6,129.50
HRWC	2020	1543	SANCTION ACCESS INC.	CA	E2L 3Y2	SAINT JOHN		NB	CAD	6,123.54
HRWC	2020	1902	HILTI (CANADA) CORPORATION	CA	L5N 6S2	MISSISSAUGA	2360 MEADOWPINE BLVD	ON	CAD	6,034.73
HRWC	2020	1627	TRIMAR PROMOTIONAL PRODUCTS	CA	B3B 1S8	Dartmouth	109 ILSLEY AVENUE, UNIT 4	NS	CAD	6,034.05
HRWC	2020	359	WESCO DISTRIBUTION- CANADA LP	CA	L3R 0S8	MARKHAM	475 HOOD ROAD	ON	CAD	5,987.32
HRWC	2020	661	MEEHAN'S GARAGE & TRUCKING	CA	B0N 2N0	HANTS CO.	2370 HWY 14, R.R.#1 UPPER RAWDON	NS	CAD	5,956.82
HRWC	2020	220	PAYZANT BUILDING PRODUCTS LTD.	CA	B4C 2R4	SACKVILLE	250 SACKVILLE DRIVE	NS	CAD	5,943.50
HRWC	2020	3580	IBI GROUP PROFESSIONAL SERVICE	CA	M4V 2Y7	TORONTO	55 ST. CLAIR AVENUE WEST	NS	CAD	5,922.50
HRWC	2020	3683	JUST DRAINS INC	CA		LOWER SACKVILLE	104 BEAVER BANK RD	NS	CAD	5,922.50
HRWC	2020	3154	ARCTIGULAR FABRICATION	CA	B2W 4A2	DARTMOUTH	46 SPAR CRES	NS	CAD	5,895.48
HRWC	2020	1941	COMMERCIAL SAFETY SURVEYS LTD.	CA	B2N 5G6	TRURO		NS	CAD	5,807.50
HRWC	2020	2863	METRO LINE-X	CA	B3K 4P3	HALIFAX	2823 ROBIE ST	NS	CAD	5,807.50
HRWC	2020	1814	DAVID MACDONALD	CA	V7E 2Z1	RICHMOND	205-3571 CHATHAM ST	BC	CAD	5,788.91
HRWC	2020	2090	EKELE INFORMATION SYSTEMS INC	US	14445-2201	EAST ROCHESTER	445 W. COMMERCIAL ST	NY	CAD	5,706.06
HRWC	2020	152	WOLSELEY INDUSTRIAL CANADA INC	CA	L7N 3V6	BURLINGTON	880 LAURENTIAN DRIVE	ON	CAD	5,700.80
HRWC	2020	298	JENTRONICS LIMITED	CA	B3B 2C8	DARTMOUTH	15 WESTON COURT	NS	CAD	5,697.06
HRWC	2020	3473	EXPERT FLUSH TOILET RENTALS	CA	B0N 1C0	BROOKFIELD	PO BOX 205, SHORTTS LAKE	NS	CAD	5,692.50
HRWC	2020	2444	TRANSPARA	US	85087	PHOENIX	4715 WEST CULPEPPER DR	AZ	CAD	5,683.04
HRWC	2020	3563	SHORELINE DISTRIBUTION LIMITED	CA	L3M 5P6	GRIMSBY	33 WILLOW LANE	ON	CAD	5,632.90
HRWC	2020	3112	WESTERN PRINCIPLES CONSULTING	CA	V6C 1G8	VANCOUVER	304-700 W. PENDER ST	BC	CAD	5,565.20
HRWC	2020	1658	TRANE ATLANTIC	CA	B3B 2E3	DARTMOUTH	109 WILLIAMS AVE, UNIT 5	NS	CAD	5,554.11
HRWC	2020	1660	LEVITT-SAFETY LIMITED	CA	L6H 5T5	OAKVILL	2872 BRISTOL CIRCLE	ON	CAD	5,521.56
HRWC	2020	947	GRAFFITI GONE	CA	B3N 1B2	HALIFAX	60 WITHROD DRIVE	NS	CAD	5,520.00
HRWC	2020	254	MARK LIVELY WELDING LTD	CA	B4C 4C5	LWR. SACKVILLE	381 COBEQUID ROAD	NS	CAD	5,424.46
HRWC	2020	1704	WEED MAN (PLANTATION HOLDINGS	CA	B3B 1R6	DARTMOUTH	60 TRIDER CRESCENT	NS	CAD	5,399.25
HRWC	2020	2981	ALUMA SYSTEMS INC	CA	B3B 1R3	DARTMOUTH	40 SIMMONDS DR	NS	CAD	5,367.97
HRWC	2020	365	SOJOURN ENTERPRISES LTD.	CA	B3B 1L3	DARTMOUTH	100 ILSLEY AVENUE, UNIT R	NS	CAD	5,354.64
HRWC	2020	3654	MARITIME AGGREGATES LTD	CA	B3B 1E1	DARTMOUTH	16 FIELDING AVE	NS	CAD	5,339.20
HRWC	2020	331	BAY EQUIPMENT RENTALS	CA	B4C 4E6	LOWER SACKVILLE	295 COBEQUID RD	NS	CAD	5,300.36
HRWC	2020	2006	NOVA TRUCK CENTRES	CA	B3B 0J4	DARTMOUTH	670 WILLINGTON AVE	NS	CAD	5,292.93
HRWC	2020	881	FRANK HORNE AUTO BODY	CA	B3G 1H9	EASTERN PASSAGE	2011 CALDWELL ROAD	NS	CAD	5,285.00
HRWC	2020	1803	LAND & SEA INSTRUMENTATION LTD	CA	B2Y 4K3	DARTMOUTH	25 ESTATES ROAD	NS	CAD	5,283.02
HRWC	2020	1372	RIDEOUT TOOL & MACHINE INC	CA	B3B 1Z5	DARTMOUTH	170 AKERLEY BLVD., UNIT 1	NS	CAD	5,256.55
HRWC	2020	3499	GENESIS INTEGRATION INC	CA	T5L 2Y6	EDMONTON	14721 123 AVENUE	AB	CAD	5,197.03
HRWC	2020	3470	QRA CONSULTING INC	CA	B3K 5L2	HALIFAX	101-6080 YOUNG ST	NS	CAD	5,175.00
HRWC	2020	1257	STATE CHEMICAL LTD.	CA	L5T 1L5	MISSISSAUGA	6935 DAVAND DRIVE	ON	CAD	5,116.97
HRWC	2020	252	ACTION FIBERGLASS / CAR AND TR	CA	E1E 0E8	MONCTON	200 HORSMAN ROAD	NB	CAD	5,103.94
HRWC	2020	1560	EASTWING PRODUCTS LIMITED	CA	B2X 2C3	DARTMOUTH	221 WAVERLEY ROAD, UNIT 6	NS	CAD	5,099.10
HRWC	2020	1343	GROUPLINK CORPORATION	US	84010-8172	BOUNTIFUL	563 W 500 S, SUITE 400	UT	CAD	5,095.07
HRWC	2020	2061	MACKAY'S TRUCK & TRAILER CENTE	CA	B2N 5E8	TRURO	PO BOX 723	NS	CAD	5,080.88
HRWC	2020	251	DILLON CONSULTING LIMITED	CA	B3S 1B3	HALIFAX	137 CHAIN LAKE DRIVE, STE 100	NS	CAD	5,071.82
HRWC	2020	2152	CONCEPTS PLASTICS INC.	CA	B3B 1I4	DARTMOUTH	31 RADDALL AVE - UNIT 5	NS	CAD	5,038.15
HRWC	2020	2236	CARVERY'S CONSTRUCTION LTD	CA	B3B 1H7	DARTMOUTH	6 RALSTON AVE	NS	CAD	5,035.74
HRWC	2020	1584	CINTAS CANADA LTD. (ZEE MEDIC	CA	M5W 0J2	TORONTO		ON	CAD	5,021.63

HALIFAX REGIONAL WATER COMMISSION
Reporting Periods - April 1, 2021 to Feb 28, 2022

[illegible]

TO: Becky Kent, B.A., Chair, and Members of the Halifax Regional Water Commission Board

SUBMITTED BY:  Digitally signed by Allan Campbell
Date: 2022.03.17 16:13:35 -03'00' *On behalf of:*
Louis de Montbrun, CPA, CA, Director, Corporate Services/CFO

APPROVED: Cathie  Digitally signed by Cathie O'Toole
Date: 2022.03.17 21:49:32 -03'00'
Cathie O'Toole, MBA, FCPA, FCGA, ICD.D, General Manager

DATE: March 11, 2022

SUBJECT: **2022 Spring Debenture**

ORIGIN

Halifax Regional Water Commission (Halifax Water) participation in the Spring 2022 Municipal Finance Corporation (MFC) debenture issue to secure debt financing for 2021/22 additions to utility plant in service and re-financing for balloon payments on existing debt.

RECOMMENDATION

It is recommended that the Halifax Water Board:

1. Approve the financing of \$15,749,000 with a thirty-year amortization term and finance over ten years. The maximum all-inclusive rate is not to exceed 5.5%.
2. Approve the re-financing of \$17,198,315 with a ten-year amortization term and financing over ten years, with an all-inclusive rate not to exceed 5.5%.

BACKGROUND

Halifax Water is legally required to borrow through the MFC. The borrowing proposed in this report is estimated using the Five Year Business Plan, the approved Operating and Capital Budgets for 2022/23, and the rate schedule approved by the Nova Scotia Utility and Review Board.

DISCUSSION

Long term debt issued for capital projects has historically been amortized for a period of twenty years based on the life of the assets being financed. Traditionally the market for twenty year financing in Canada has been more expensive than ten year financing. To take advantage of the lower ten year rates, debt is amortized over twenty years and financed for ten years and then a balloon payment is used to refinance the balance for the remaining ten years. Though a lower interest rate cost is secured for the first ten years, there is a risk that interest rates will be higher at the time the balloon payments are due for refinancing.

In 2021/22, Halifax Water reviewed the useful lives of the assets being brought into service and determined that the useful lives were more than 20 years. To better match the debt to the useful lives, Halifax Water is recommending that the amortization period for new debt be 30 years, rather than 20 years, and there to be three 10 year financing terms. The 2022/23 Operating Budget has been developed using this assumption.

The 2022/23, Operating Budget was prepared based on issuing new debt of \$15.7 million to finance water and stormwater additions to utility plant in service. The \$15.7 million will be applied to water and stormwater as follows:

Water	\$13.1 million
Stormwater	\$2.6 million

In addition to funding the new capital assets, refinancing of \$17.2 million is required in the Spring of 2022 for a balloon payment.

The balloon payment due relates to debt issued in fiscal 2012/13 of \$34.4 million which was acquired to fund wastewater capital expenditures. There were two debentures issued, both for ten year terms with twenty year amortization. The first 2012/13 debenture of \$2,396,630 issued May 15, 2012 had an all-in interest rate of 3.64% and the second 2012/13 debenture of \$32,000,000 issued July 6, 2012 had an all-in interest rate of 3.08%. Halifax Water's current Weighted Average Cost of Debt is 2.86% and the Fall 2020 Debenture had an interest rate of 2.26%. It is anticipated that the new debt issue can be expected to have a lower interest rate than the original debt issue but based on the current uncertainty in the world financial markets it is difficult to predict with certainty.

In the recommendation, Halifax Water uses a rate of 5.5% as recommended by MFC. This would be the upper limit that Halifax Water can finance debt. If the actual interest rate is greater than 5.5%, a revised report will be required for the Board. If the actual interest rate is lower than 5.5%, a revised report is not required.

The final interest rates and timing of the debt issues will not be known with certainty until MFC concludes the formal debenture process.

Halifax Water's debt is covered by a blanket guarantee approved by Halifax Regional Municipality (HRM) Council in September 2014. The blanket guarantee will apply to all Halifax Water debt with a condition that Halifax Water must maintain a debt service ratio of 35% or less. Halifax Water's debt service ratio is 18.95% as of January 31, 2022. The debt service ratio is calculated as the cost of debt interest, principal and discount payments divided by the total Operating Revenue as found on the income statement (NSUARB format).

Halifax Water's outstanding debt at January 31, 2022 (including the current portion) was \$224.1 million, and debt is projected to be \$224.0 million at March 31, 2022.

BUDGET IMPLICATIONS

The 2022/23 budget includes \$28.5 million in debt servicing costs. Halifax Water's capital financing strategy is designed to maintain a debt service ratio of 35% or less; and to use a mixture of infrastructure funding, development related charges (reserves), depreciation, and debt.

ALTERNATIVE

1. Halifax Water could choose to delay the new debt for Spring 2022 to the Fall 2022 debenture issue. This would lower debt servicing expenditures by \$0.4 million. Halifax Water has chosen not to delay obtaining the new debt due to several factors. These include a heavier demand on cash throughout the summer and fall relating to capital work in progress expenditures and uncertainty relating to the timing of the Fall debenture. The Fall 2020 debenture was delayed by the MFC due to the demand for debt being higher than they anticipated and funds were not received until May 2021. Halifax Water does not want to risk another delay.

Attachment 2 provides a cash flow estimate for the 2022/23 fiscal year. The model estimates capital expenditures for the year to be \$69.5 million based on spending patterns and current projects in progress. There is potential for the expenditures to be more based on the 2022/23 capital budget of \$106.5 million and other projects from previous fiscal years that had been delayed. If expenditures begin to trend higher than projected, Halifax Water can reassess their Fall 2022 debt requirements.

ATTACHMENTS

1. Borrowing Resolution for \$32.9 million of debt.
2. Cash Flow Model for 2022/23 based on approved Operating and Capital Budgets and anticipated cash flow.

Report prepared by:	Alicia Scallion	<div style="font-size: small;">Digitally signed by Alicia Scallion Date: 2022.03.17 15:23:21 -03'00'</div> <hr/> <div>Alicia Scallion, CPA, CA, Manager, Accounting, 902-497-9785</div>
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HALIFAX REGIONAL WATER COMMISSION
BORROWING RESOLUTION

WHEREAS the Halifax Regional Water Commission (Halifax Water), is incorporated under the provisions of the *Halifax Regional Water Commission Act*, Ch. 55 of the Acts of 2007 (the “Act”);

AND WHEREAS the Act provides that Halifax Water has power to borrow such sums as may be authorized and approved by the Board of the Commission for the purposes of the Commission, subject to the approval of the Nova Scotia Utility and Review Board;

AND WHEREAS Halifax Water wishes to borrow \$15,749,000 for the purpose of financing regular additions to utility plant in service for a 30 year amortization period;

AND WHEREAS Halifax Water wishes to borrow \$17,198,315 for the purpose of refinancing balloon payments for their remaining 10 year amortization period;

AND WHEREAS a blanket guarantee for Halifax Water Debt was approved by the Halifax Regional Municipality on September 23, 2014;

BE IT RESOLVED THAT:

1. Under the authority of Section 16 of the *Act*, Halifax Water borrow from the Municipal Finance Corporation, for the purpose set forth above, a sum or sums not exceeding \$15,749,000 with a thirty-year amortization term and finance over ten years, and \$17,198,315 with a ten-year amortization term and finance over ten years. The maximum all-inclusive rate is not to exceed 5.5% percent;
2. The sum noted above be borrowed by the issue of debentures of Halifax Water to such an amount as Halifax Water deems necessary and that the debentures be arranged with the Nova Scotia Municipal Finance Corporation, with interest to be paid semi-annually and principal payments made annually; and
3. This resolution remains in force for a period of not more than 12 months from the passing of this resolution.

I certify the above to be a true copy of a Resolution approved at a meeting of the Halifax Water Board of Directors held on March 24, 2022.

Heidi Schedler, Q.C.
General Counsel and Corporate Secretary

Halifax Water
Cash Flow Model for 2022-23

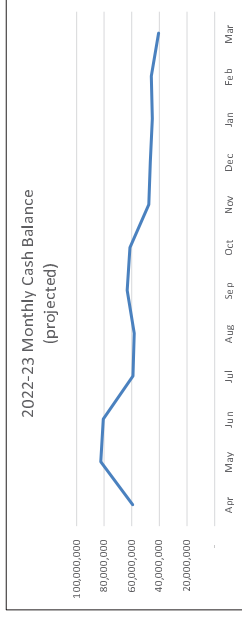
	2022/23 Budget	2022/23 Forecast	2022/23 Forecast	2022/23 Adjustments for Cash Flow	2022/23 Cash Flow	2022/23 Forecast March 2022	2022/23 Budgeted Mar	2022/23 Budgeted Apr	2022/23 Budgeted May	2022/23 Budgeted Jun	2022/23 Budgeted Jul	2022/23 Budgeted Aug	2022/23 Budgeted Sep	2022/23 Budgeted Oct	2022/23 Budgeted Nov	2022/23 Budgeted Dec	2022/23 Budgeted Jan	2022/23 Budgeted Feb	2022/23 Budgeted Mar	Total
Operating Revenue	152,760,532 (107,350,104)	152,760,532 (107,350,104)	152,760,532 (107,350,104)	-	152,760,532 (97,935,549)	11,540,000 (8,000,000)	11,461,442 (7,944,629)	11,461,442 (7,944,629)	11,461,442 (7,944,629)	11,761,442 (7,944,629)	11,761,442 (7,944,629)	12,261,442 (9,244,629)	23,884,668 (7,944,629)	12,261,442 (9,244,629)	11,761,442 (7,944,629)	11,761,442 (7,944,629)	11,461,442 (7,944,629)	11,461,442 (7,944,629)	11,461,442 (7,944,629)	164,300,532 (105,935,549)
Operating Expenses																				
Non Operating Revenue	732,966 (66,449,793)	732,966 (66,449,793)	732,966 (66,449,793)	-	732,966 (59,450,926)	65,000 (6,954,021)	61,081 (3,854)	61,081 (3,854)	61,081 (3,854)	61,081 (3,854)	61,081 (3,854)	61,081 (3,854)	61,081 (3,854)	61,081 (3,854)	61,081 (3,854)	61,081 (3,854)	61,081 (3,854)	61,081 (3,854)	61,081 (3,854)	797,966 (66,404,947)
Operations Total	(20,306,399)	(20,306,399)	(20,306,399)	16,413,422	(3,892,977)	(3,349,021)	3,574,040	3,574,040	3,495,548	3,535,694	(15,930,209)	4,374,040	10,009,416	3,074,040	(16,244,689)	3,818,334	3,373,618	3,574,040	(3,555,751)	(7,241,998)
Capital Expenditures (incl CCC projects)	(106,485,000)	(106,485,000)	(106,485,000)	-	(69,464,000)	(6,000,000)	(5,788,667)	(5,788,667)	(5,788,667)	(5,788,667)	(5,788,667)	(5,788,667)	(5,788,667)	(5,788,667)	(5,788,667)	(5,788,667)	(5,788,667)	(5,788,667)	(5,788,667)	(75,464,000)
New Long Term Debt	40,611,990	40,611,990	40,611,990	(345,202)	40,266,788	-	32,667,263	-	-	-	-	-	-	-	7,595,525	-	-	-	-	40,266,788
Other Incoming Cash (Build Can, RDC, etc)	11,000,000	11,000,000	11,000,000	-	11,000,000	1,000,000	879,667	879,667	879,667	879,667	879,667	879,667	879,667	879,667	879,667	879,667	1,027,667	1,027,667	1,027,667	12,000,000
Changes in working capital	-	-	-	-	-	-	(1,950,000)	(1,950,000)	(1,100,000)	(450,000)	(700,000)	(250,000)	(150,000)	(100,000)	(100,000)	(100,000)	(100,000)	2,000,000	3,000,000	-
Net Cash Flow	(75,179,409)	(38,158,409)	(38,158,409)	16,068,220	(22,090,189)	(8,349,021)	(3,284,960)	(3,284,960)	23,162,715	(1,823,306)	(21,539,209)	(784,960)	4,950,416	(1,934,960)	(13,654,164)	(1,190,666)	(1,487,382)	813,040	(5,316,751)	(30,439,210)
Opening Cash Balance					71,000,000	71,000,000	62,650,979	59,366,019	59,366,019	82,528,734	80,705,428	59,166,218	58,381,258	58,381,258	63,331,674	61,396,714	61,396,714	45,064,502	45,877,542	71,000,000
Ending Cash Balance					40,560,790	40,560,790	59,366,019	59,366,019	82,528,734	80,705,428	59,166,218	58,381,258	58,381,258	63,331,674	61,396,714	47,742,550	46,551,884	45,877,542	40,560,790	40,560,790

Notes

- Adjustments for Cash Flow include removing the non cash portion of the Pension Expense, Depreciation, and Debt Discount
- Debt principle and interest payments are included in the Non Operating Expenses category
- Capital Expenditures includes an estimated capital spend of \$69.4 million based on historical patterns.
- The new Long Term Debt anticipated in this forecast is for \$15.7m in new debt and \$24.7m in Balloon renewals
- Other Incoming Cash includes \$11 million in RDC Collections


Opening Cash Balance highlighted in green at February 28, 2022

Closing Cash Balance highlighted in blue




TO: Becky Kent, B.A., Chair, and Members of the Halifax Regional Water Commission Board

SUBMITTED BY:


Digitally signed by Reid Campbell
Date: 2022.03.17 14:42:12 -03'00'


Reid Campbell, M.Eng., P.Eng.
Director, Engineering and Technology Services


Digitally signed by Allan Campbell
Date: 2022.03.17 10:51:53 -03'00'

On behalf of:

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

APPROVED:


Digitally signed by Cathie O'Toole
Date: 2022.03.17 10:53:47 -03'00'

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

DATE: March 18, 2022

SUBJECT: Capital Expenditures for the Eleven Months Ended February 28, 2022

ORIGIN

The Corporate Balanced Scorecard identifies the percentage of capital budget spent by the end of the fiscal year as a critical success factor and sets a target of 70-80%.

BACKGROUND

The Halifax Regional Water Commission (Halifax Water) Board is required to review periodic financial information throughout the year. Halifax Water's 2019 *Integrated Resource Plan* (IRP) identifies a 30-year capital investment plan valued at \$2.7 Billion (net present value). In relation to the IRP, the capital budget program focuses on providing required infrastructure for asset renewal, regulatory compliance, and growth. The IRP calls for delivery of an average of \$135 million dollars in capital projects per year. Halifax Water's annual capital budget, and capability to deliver capital projects, has not yet reached this level.

DISCUSSION

Below is the breakdown by asset class and project status of the expenditures for the eleven (11) months ending February 28, 2022. Last year Halifax Water delivered 30.78% of the budgeted capital spend for 2020/21 by end of fiscal year. Based on the eleven months ending February 28, 2022 capital spend for 2021/22 is over \$43.4 million, of this \$23.9 million relates to spend specifically on the 2021/22 capital

ITEM # 5.1

Halifax Water Board

March 24, 2022

budget of \$129.2 million resulting in an 18.93% delivery rate. There is a lag from when work is conducted, billed to Halifax Water, progress claims are reviewed, processed for payment, then appear in actual expenditures. At year end close, there is a significant focus on ensuring all work conducted during the fiscal year is invoiced to Halifax Water and recorded as accounts payable. As a result of the year end activities, it is likely that the % delivery rate will increase significantly when final year end results are known, however it is unlikely that the % of the 21/22 capital spend will be significantly different than the 30.78% in 2020/21. There are several significant projects in this year's capital budget for which construction has been delayed or extended into the next construction season for reasons including, construction market conditions, land acquisition, planning consideration or issues that arose during the planning phase which required a scope change.

There are two positive indications that capital activity in 2021/22 is greater than 2020/21. The first is that there are more active projects with spending against them compared to the prior year, and the second is that \$9.7 million has been spent from funding available from under spent, deferred or cancelled projects, which would otherwise have been spent from 21/22 capital budget reallocations; meaning that the % of capital spent from current year budget is lower than it would otherwise be. As we become increasingly effective at tracking and utilizing available funding rather than impacting the current year budget, this illustrates the need to revisit what metrics are used to measure the effectiveness of capital project delivery.

As of Feb 28, 2022	Total # of Projects with Spend in 21/22	# of Projects with Spend in 21/22 against 21/22 Budget	# of Projects with Carry over Spend in 21/22	Funding Drawn from closed projects (under budget) or cancelled projects
Water	192	85	107	5,933,600.00
Wastewater	178	90	88	1,814,463.36
Stormwater	61	31	30	1,984,000.00
	431	206	225	9,732,063.36

As of March 31, 2021	Total # of Projects with Spend in 20/21	# of Projects with Spend in 20/21 against 20/21 Budget	# of Projects with Carry over Spend in 20/21
Water	163	58	105
Wastewater	163	66	97
Stormwater	59	21	38
	385	145	240

ITEM # 5.1

Halifax Water Board

March 24, 2022

Capital Expenditure Report

Budget Category	Total Budget Available	Expenditures to March 31, 2021	Expenditures April 1, 2021 to February 28, 2022	Total Expenditures to February 28, 2022	Remaining Budget Available as of February 28, 2022	Total Forecasted Expenditures to March 31, 2022	Total Forecasted Expenditures to the End of the Project	Remaining Budget Available	Total Expenditures to February 28, 2022 as a Percentage of Total Budget Available	Total Expenditures to February 28, 2022 as a Percentage of Total Forecasted Expenditures to the End of the Project
Active										
Water	\$ 92,851,535	\$ 13,991,742	\$ 18,876,427	\$ 32,868,169	\$ 59,983,366	\$ 84,118,589	\$ 84,445,882	\$ 8,405,653	35.4%	38.9%
Wastewater	106,216,194	14,875,692	18,236,505	33,112,197	73,103,997	20,149,255	30,483,318	75,732,876	31.2%	108.6%
Stormwater	16,330,015	1,272,476	6,056,162	7,328,638	9,001,377	12,909,518	8,059,255	8,270,760	44.9%	90.9%
	215,397,744	30,139,910	43,169,094	73,309,004	142,088,740	117,177,362	122,988,455	92,409,289	34.0%	59.6%
Pending										
Water	16,746,689	85,758	57,460	143,218	16,603,471	6,486,000	6,486,000	10,260,689	0.9%	2.2%
Wastewater	26,158,000	2,433	(1,581)	852	26,157,148	1,000,000	120,000	26,038,000	0.0%	0.7%
Stormwater	784,238	(227)	-	(227)	784,465	-	-	784,238	0.0%	0.0%
	43,688,927	87,964	55,879	143,843	43,545,084	7,486,000	6,606,000	37,082,927	0.3%	2.2%
Closed										
Water	1,776,942	99,569	123,045	222,614	1,554,328	738,190	738,190	1,038,752	12.5%	30.2%
Wastewater	814,672	484,452	69,205	553,657	261,015	330,000	5,769,486	(4,954,814)	68.0%	9.6%
Stormwater	-	233	-	233	(233)	-	-	-	0.0%	0.0%
	2,591,614	584,254	192,250	776,504	1,815,110	1,068,190	6,507,676	(3,916,062)	30.0%	11.9%
	\$261,678,285	\$ 30,812,128	\$ 43,417,223	\$ 74,229,351	\$187,448,934	\$125,731,552	\$136,102,131	\$125,576,154	28.4%	54.5%

The Total Budget Available of \$261.7 million represents total approved budgets for pending, active, and closed projects as at the end of February 28, 2022.

Total Expenditures to February 28, 2022 of \$74.2 million include expenditures of \$30.8 million incurred prior to April 1, 2021 and expenditures of \$43.4 million in the current fiscal year. This results in a Remaining Budget Available as of February 28, 2022 of \$187.4 million.

Project Managers have updated forecasted total expenditures to the end of the 2021/22 fiscal year and to the end of each project, resulting in forecasted spend of \$84.1 million.

In the Pending project category, there is \$28.4 million that has been deferred or cancelled. In addition, there is \$21.7 million that has been made available from surpluses on closed projects, of which \$9.7 million has been allocated to projects in the current fiscal year. This funding is available to be reallocated to existing projects, if required, or used to fund future capital budgets.

As projects are completed, they will be moved to the closed category. Few projects have yet been closed in this fiscal year, most are closed in the last month of the fiscal year.

ATTACHMENT

Capital Expenditure Report February 28, 2022

Report prepared by:

**Alicia
Scallion**


Digitally signed by Alicia
Scallion
Date: 2022.03.17
15:19:32 -03'00'

Alicia Scallion, CPA, CA, Manager, Accounting, (902)-497-9785


Capital Expenditure Report
For the Period Ending February 28/22

Status	Service	Asset Category	Total Budget Available	Expenditures to March 31, 2021	Expenditures April 1, 2021 to February 28, 2022	Total Expenditures to February 28, 2022	Remaining Budget Available as of February 28, 2022	Total Forecasted Expenditures to March 31, 2022	Total Forecasted Expenditures to the End of the Project	Remaining Budget Available
Active	W	Water - Land	315,000	44,449	347	44,796	270,204	341,000	341,000	(26,000)
		Water - Transmission	8,737,468	841,340	1,358,094	2,199,434	6,538,034	9,985,000	9,985,000	(1,247,532)
		Water - Distribution	9,287,814	121,835	2,684,945	2,806,780	6,481,034	7,712,000	7,712,000	1,575,814
		Water - Energy	200,000	-	-	-	200,000	-	-	200,000
		Water - Structures	16,149,000	4,563,196	4,564,247	9,127,443	7,021,557	15,207,446	15,254,181	894,819
		Water - Treatment Facilities	9,809,000	167,819	675,068	842,887	8,966,113	3,184,000	3,446,094	6,362,906
		Water - Security	-	-	-	-	-	-	-	-
		Water - Equipment	14,075,000	1,676,444	1,504,343	3,180,787	10,894,213	12,307,000	12,325,463	1,749,537
		Water - Corporate Projects	34,278,253	6,576,659	8,089,384	14,666,043	19,612,210	35,382,143	35,382,143	(1,103,890)
	W Total		92,851,535	13,991,742	18,876,427	32,868,169	59,983,366	84,118,589	84,445,882	8,405,653
	WW	Wastewater - Trunk Sewers	17,976,963	19,020	592,175	611,195	17,365,768	-	42,760	17,934,203
		Wastewater - Collection System	38,719,337	9,221,920	5,114,765	14,336,685	24,382,652	8,919,000	15,397,977	23,321,360
		Wastewater - Force mains	3,110,000	94,869	1,438,527	1,533,396	1,576,604	60,000	140,000	2,970,000
		Wastewater - Structures	18,167,027	3,017,141	4,447,586	7,464,727	10,702,300	1,145,000	5,035,360	13,131,667
		Wastewater - Treatment Facility	16,905,524	2,178,094	4,599,114	6,777,208	10,128,316	6,883,055	8,071,221	8,834,303
		Wastewater - Energy	739,000	56,265	4,692	60,957	678,043	600,000	30,000	709,000
		Wastewater - Security	200,000	902	106,214	107,116	92,884	-	-	200,000
		Wastewater - Equipment	460,000	49,397	61,331	110,728	349,272	120,000	-	460,000
		Wastewater - Corporate Projects	9,893,343	200,295	1,872,101	2,072,396	7,820,947	2,422,200	1,766,000	8,127,343
		Wastewater - Unregulated	45,000	37,788	-	37,788	7,212	-	-	45,000
	WW Total		106,216,194	14,875,692	18,236,505	33,112,197	73,103,997	20,149,255	30,483,318	75,732,876
	SW	Stormwater - Pipes	4,989,000	204,807	1,036,172	1,240,979	3,748,021	3,180,972	5,095,055	(106,055)
		Stormwater - Culverts/Ditches	5,736,000	644,470	1,734,236	2,378,706	3,357,294	4,554,000	2,944,200	2,791,800
		Stormwater - Structures	4,723,000	73,821	3,183,187	3,257,008	1,465,992	4,723,000	20,000	4,703,000
		Stormwater - Corporate Projects	882,015	349,378	102,568	451,946	430,069	451,546	-	882,015
	SW Total		16,330,015	1,272,476	6,056,162	7,328,638	9,001,377	12,909,518	8,059,255	8,270,760
Active Total			215,397,744	30,139,910	43,169,094	73,309,004	142,088,740	117,177,362	122,988,455	92,409,289
Pending	W	Water - Land	580,000	-	-	-	580,000	-	-	580,000
		Water - Transmission	1,237,400	-	-	-	1,237,400	-	-	1,237,400
		Water - Distribution	275,000	25,484	8,423	33,907	241,093	261,000	261,000	14,000
		Water - Energy	455,000	-	-	-	455,000	-	-	455,000
		Water - Structures	2,550,000	17,984	-	17,984	2,532,016	2,250,000	2,250,000	300,000
		Water - Treatment Facilities	8,244,000	-	-	-	8,244,000	3,975,000	3,975,000	4,269,000
		Water - Security	63,412	14,010	49,402	63,412	-	-	-	63,412
		Water - Corporate Projects	3,341,877	28,280	(365)	27,915	3,313,962	-	-	3,341,877
	W Total		16,746,689	85,758	57,460	143,218	16,603,471	6,486,000	6,486,000	10,260,689
	WW	Wastewater - Collection System	7,531,000	-	-	-	7,531,000	-	-	7,531,000
		Wastewater - Force mains	60,000	-	-	-	60,000	-	-	60,000
		Wastewater - Structures	7,674,000	-	-	-	7,674,000	-	-	7,674,000
		Wastewater - Treatment Facility	8,975,500	-	-	-	8,975,500	1,000,000	70,000	8,905,500
		Wastewater - Energy	1,662,500	-	-	-	1,662,500	-	-	1,662,500
		Wastewater - Security	100,000	-	-	-	100,000	-	-	100,000
		Wastewater - Equipment	150,000	-	-	-	150,000	-	-	150,000
		Wastewater - Corporate Projects	5,000	2,433	(1,581)	852	4,148	-	50,000	(45,000)
	WW Total		26,158,000	2,433	(1,581)	852	26,157,148	1,000,000	120,000	26,038,000
	SW	Stormwater - Pipes	381,238	(227)	-	(227)	381,465	-	-	381,238
		Stormwater - Culverts/Ditches	280,000	-	-	-	280,000	-	-	280,000
		Stormwater - Structures	93,000	-	-	-	93,000	-	-	93,000
		Stormwater - Corporate Projects	30,000	-	-	-	30,000	-	-	30,000
	SW Total		784,238	(227)	-	(227)	784,465	-	-	784,238
Pending Total			43,688,927	87,964	55,879	143,843	43,545,084	7,486,000	6,606,000	37,082,927
Closed 21/22	W	Water - Transmission	14,050	5,928	8,776	14,704	(654)	13,000	13,000	1,050
		Water - Distribution	-	-	-	-	-	-	-	-
		Water - Structures	-	-	-	-	-	-	-	-
		Water - Corporate Projects	1,762,892	93,641	114,268	207,909	1,554,983	725,190	725,190	1,037,702
	W Total		1,776,942	99,569	123,045	222,614	1,554,328	738,190	738,190	1,038,752
	WW	Wastewater - Collection System	598,000	484,137	-	484,137	113,863	250,000	2,366,162	(1,768,162)
		Wastewater - Treatment Facility	201,672	71	53,406	53,477	148,195	40,000	1,750,000	(1,548,328)
		Wastewater - Corporate Projects	15,000	243	15,798	16,041	(1,041)	40,000	1,653,324	(1,638,324)
	WW Total		814,672	484,452	69,205	553,657	261,015	330,000	5,769,486	(4,954,814)
	SW	Stormwater - Corporate Projects	-	233	-	233	(233)	-	-	-
	SW Total		-	233	-	233	(233)	-	-	-
Closed 21/22 Total			2,591,614	584,254	192,250	776,504	1,815,110	1,068,190	6,507,676	(3,916,062)
Grand Total			261,678,285	30,812,128	43,417,223	74,229,351	187,448,934	125,731,552	136,102,131	125,576,154

TO: Becky Kent, Chair, and Members of the Halifax Regional Water Commission Board

SUBMITTED BY:  Digitally signed by Reid Campbell
Date: 2022.03.18 12:01:29 -03'00'

Reid Campbell, P. Eng.
Director, Engineering & Technology Services

APPROVED BY: Cathie  Digitally signed by Cathie O'Toole
Date: 2022.03.18 12:04:50 -03'00'

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

DATE: March 24, 2022

SUBJECT: Cogswell District Energy System (DES)
Utility Formation + Initial Capital Approval

PRIVATE AND CONFIDENTIAL

ORIGIN

1. Halifax Regional Municipality Cogswell Redevelopment Project Initiation
2. Halifax Water Board Report, Item 6-I, June 21, 2018
3. Halifax Water Board Report, Item 9-I, January 19, 2019
4. Halifax Water Board Report, Item 6-I, March 28, 2019
5. Halifax Water Board Report, Item 5C, January 30, 2020
6. Halifax Water Board Report, Item 6C-I, November 19, 2020

RECOMMENDATION

It is recommended that the Halifax Water Board approve:

1. Execution of a cost sharing agreement with the Halifax Regional Municipality for construction of the Cogswell District Energy System (DES) distribution piping system wherein \$1,302,780 is the net Halifax Water share of the overall \$3,809,199 construction costs of the Cogswell DES distribution piping system.
2. Capital funding in the amount of \$900,000 for the detailed design of the DES energy centre.

3. Capital funding in the amount \$500,000 for development of the regulated DES including development of the cost of service model, rate studies, operating procedures, business processes and regulations.
4. Application to the Nova Scotia Utility & Review Board for approval of the capital expenditure and establishment of the regulated DES service within Halifax Water based on the established business case.

BACKGROUND

The Halifax Regional Municipality (HALIFAX) is in the process of redeveloping the Cogswell interchange area located in downtown Halifax. The overall project scope includes the demolition and reconstruction of existing road and utility infrastructure, including water, wastewater, stormwater, natural gas, electric, and telecommunications infrastructure, as well as the Cogswell DES distribution piping system (DPS). HALIFAX is underway with the first phase of demolition and re-construction, working with Dexter Construction as their lead contractor.

Halifax Water is engaged in this project in two distinct areas. First, Halifax Water is proposing the design, construction and operation of a DES (see Attachment 1 - DES Proof of Concept); and second, Halifax Water has a significant volume of existing and proposed water, wastewater and stormwater infrastructure to be relocated or constructed within the project limits.

For the water, wastewater, and stormwater infrastructure, HALIFAX, via their consultant WSP and contractor Dexter Construction, has completed detailed designs and begun construction for all water, wastewater and stormwater infrastructure relocations and/or new installations required to facilitate the Cogswell project. Halifax Water staff is fully engaged in the construction process for all its impacted infrastructure. The balance of this report relates to the implementation of the DES project.

The proposed DES will supply/remove thermal energy for the purpose of heating and cooling the six mixed-use high-rise commercial/residential developments proposed to be constructed within the Cogswell redevelopment area in downtown Halifax. (See Attachment 1 – Cogswell DES Proof of Concept for more details). This project aligns very well with Halifax Water’s mission, vision, and strategic objectives, and will significantly contribute to the goals of HALIFAX’s “HalifACT 2050” initiative, providing long term energy and greenhouse gas (GHG) emission reductions within the downtown core.

For the DES, Halifax Water has to date:

- completed an initial feasibility study for the DES (Ref. Attachment 4 - Cogswell DES Feasibility Study – Executive Summary, dated June 16th, 2016);
- completed the 100% detailed design of the linear infrastructure (DPS);
- developed a draft financial model for the DES utility;
- evaluated the business case based on several operating and ownership scenarios;
- completed a by-law review of other Canadian jurisdictions that have implemented similar district energy utilities; and
- completed a stakeholder/developer information document to better inform our stakeholders and potential developers on the DES.

HALIFAX has modified their Charter to allow district energy to proceed within the municipality, and passed “*By-Law D-500, Respecting District Energy*”, which was approved by the Halifax Water Board on January 30th, 2020 and by HALIFAX Regional Council on August 18th, 2020. This by-law, along with the modification enacted by HALIFAX to the Charter, mandates connection of new buildings constructed within the Cogswell Redevelopment boundary to the DES. This, along with an approved regulatory oversight framework, are necessary components required by Halifax Water to mitigate financial and operational risks to the development of the DES.

Previously approved Halifax Water funding for the DES includes:

- \$15,000 for the DES feasibility study completed in 2016; and
- \$355,000 for the preliminary and detailed design of the DPS, construction phase services, a municipal by-law review, a developer information package, and the further development of the DES as a utility (i.e., business case development, cost-of-service modelling, NSUARB application, etc.).

To date, \$272,678 of the total approved funding has been spent.

From a funding perspective, Halifax Water applied for approximately \$10,263,266 in funding under the Infrastructure Canada’s Investing in Canada Infrastructure Program (ICIP). Approval for this funding was received on June 23rd, 2021. The total estimated cost of the DES is anticipated to be approx. \$15,605,358, with \$5,598,400 coming from the Federal government, and \$4,664,866 coming from the Province of Nova Scotia. Halifax Water’s net contribution is anticipated to be \$5,342,093, including overheads, contingencies, and net HST. A summary of the Federal/Provincial funding, net-Halifax Water, and total project costs is provided in Attachment 2.

Securing the Federal/Provincial funding and By-Law D-500 requiring mandatory connections, coupled with rising costs of other energy alternatives, all combine to make a strong, relatively low-risk business case for the DES.

DISCUSSION

Cogswell Project Approval and Implementation

On September 14th, 2021, HALIFAX approved the award of the construction tender for the Cogswell Redevelopment Project to Dexter Construction Inc. This includes the demolition of the old Cogswell area street infrastructure, and the construction of a new street network, existing utility relocations, and new underground services (i.e., water, wastewater, stormwater, natural gas, electricity, telecommunications). The DPS will be installed in parallel with the other Cogswell area underground infrastructure, as it would not be technically feasible nor financially viable to disturb new infrastructure to install the DPS at a later date.

HALIFAX started the demolition/construction phase of the Cogswell Redevelopment project in the fall of 2021. To date, demolition/construction has started on Phase 1 (Barrington at Upper Water) to install a small detour section from Barrington Street to Upper Water Street. The latest construction schedule includes the milestones shown in Table 1.

ITEM # 5.2

Halifax Water Board

March 24, 2022

Table 1 - Cogswell Redevelopment Project Milestone Schedule

Phase/Description	Start Date	Completion Date	Duration
Phase 1 – Detour 1 – Barrington/Upper Water	October 19, 2021	July 25, 2022	36 weeks
Phase 1 – Detour 2 – Hollis Street	January 26, 2022	July 25, 2022	26 weeks
Phase 1 – Detour 3 – Cogswell Street	February 22, 2022	July 25, 2022	22 weeks
Phase 1 – Demolitions/Underground Infrastructure	January 2022	June 2023	78 Weeks
Phase 2 – Cogswell/Proctor/Upper Water/Hollis	July 2023	July 2024	50 weeks
Phase 3 – Poplar/Barrington/Lower Water/Parks/Tie-Ins	August 2024	August 2025	52 weeks
Ref. HALIFAX Document Proposed Project Construction Phasing Plan September 15 2021.pdf: https://www.halifax.ca/sites/default/files/documents/about-the-city/regional-community-planning/Proposed%20Project%20Construction%20Phasing%20Plan%20September%2015%202021.pdf			

DES – A Regulated Utility

Any district energy services envisioned by Halifax Water were always anticipated to be provided through a regulated utility. Halifax Water held initial informal discussions with the NSUARB to determine a way forward, and on February 7th, 2020 filed an application with the NSUARB for a ruling on whether the proposed DES would be a public utility service, regulated by the NSUARB pursuant to the *Public Utilities Act*, R.S.N.S. 1989, c.380 (*PUA*). In their response (M09583), the NSUARB determined that if the DES is established as set out in the application, Halifax Water will own and operate it as a public utility, subject to the Board’s oversight under the *PUA*.

DES – Business Case

The business case for the DES has been continually updated and refined to reflect new information as available. Latest updates include adjusting the external funding and debt/equity ratios to reflect the approved ICIP funding received for the project in 2021, current and future electricity price updates based on Nova Scotia Power’s recent (January 2022) rate application, the addition of heating/cooling district energy rate functionality to better reflect the “Business as Usual” (BAU) energy source for each service, the schedule of construction for each asset to match the HALIFAX schedule for the construction of the overall Cogswell project, capital costs based on the most recent actual pricing from HALIFAX and others (as available), updated utility demand calculations to adjust various technical assumptions, and updated various financial assumptions as necessary. The updated Business Case dated March 17th, 2022, is provided as Attachment 3.

The business case modelling is also based on several important technical assumptions, including the anticipated footprint and number of floors for each building. HALIFAX’s Cogswell project is based on the eventual development of six new buildings on lots A through J (300,500 m² of floor space) as shown in Figure 1. These new lots are all within the mandatory DES connection boundary as described and identified in the recently revised HALIFAX Charter (ref. *HALIFAX Charter, Chapter 39 of the Acts of 2008; 2019, c.19, ss.10-18; 2019, c.36, s.2*).

From a risk perspective, one of the higher project risks is the potential for space reduction to changes to the planned developments. Any proposed reduction in the total building size and gross floor area (GFA) will have a proportional and direct impact on building use, energy use/sales, GHG

emissions, and the overall DES business case. Possible causes of building size/area reductions could include smaller building footprints versus HALIFAX's original plan, alternative building use (e.g., decreased multi-story/increased affordable housing, changes to tower to total GFA ratios, or changes to commercial/residential space ratios), and the elimination of buildings due to changing HALIFAX development regulations (e.g., Center Plan). Halifax Water has continued to use HALIFAX's latest planning estimates (Ref. *HALIFAX – Cogswell Building Design Basis – 90% - June 2019*) for building use, sizes and GFA to calculate building energy/demand loads, GHG emission savings, revenues in our financial modelling and business case development.

In addition, Halifax Water has developed a risk registry identifying all potential additional project risks and a high-level risk management plan to identify, rate, and where possible, implement risk mitigation strategies to effectively mitigate risks. Halifax Water takes the position that all risks identified to-date are minor in nature and reasonably manageable. Nothing has been identified that would prevent Halifax Water from moving forward with the DES.

The current business model is structured to achieve the following:

1. Demonstrate competitiveness against other BAU scenarios by selecting DES energy and demand rates that are less than or equal to competitive energy sources. Annual escalation rates based on local historical averages for each energy source are used. A 20-year analysis has been used to avoid extending the analysis too far into the future, thereby including too many uncertainties.
2. Develop preliminary energy rates for heating and cooling have been used to better reflect the actual energy source for each service. A heating rate has been selected that is less than but considerate of the BAU rate for local natural gas, as natural gas is the current BAU choice for heating in mixed-use, high-rise buildings in Halifax. A cooling rate has been selected that is less than but considerate of the BAU rate for local electricity, as electricity is the current BAU choice for cooling using refrigeration systems and cooling towers in mixed-use, high-rise buildings in Halifax.
3. Present the preliminary financial results of the utility, including Return on Equity (ROE), Internal Rate of Return (IRR), Net Present Value (NPV), Earnings from Operations, and Cash Flow.

The current business case for the DES is very positive, especially given the level of capital funding approved by Infrastructure Canada and the Province of Nova Scotia through their joint Investing in Canada Infrastructure Program (ICIP). The ICIP funding, which amounts to 73.33% of eligible development and capital costs, greatly improves the already positive financial metrics of the project, as well as the DES energy rate structure. This funding will mitigate project risks, allow the utility to reduce the energy and demand rates of the DES, and allow the utility to improve the NPV, IRR, and ROE for the project. Table 2 provides an illustrative example of a potential rate structure, along with a comparison of competitive energy rates, and the corresponding financial metrics.

Table 2 - Comparative Energy Rate + Financial Analysis

Energy/Demand Rates	DES	Comparative
Heating (\$/kWh)	\$0.0417	\$0.07499 (natural gas)
Cooling (\$/kWh)	\$0.0900	\$0.14413 (electricity Rate 11) \$0.16215 (electricity Rate 2)
Demand (\$/kW)	\$10.00	\$10.96 (electricity)
DES Financial Metrics		
Analysis Period	40 Years	
Net Present Value	\$65,866,000	
Internal Rate of Return	9.0%	
Simple Payback	12.1 Years	

Formalization of the DES Regulated Utility

With the realization of the following three key milestones:

1. Commencement of the construction phase of the HALIFAX Cogswell Redevelopment Project,
2. Issuance of the NSUARB decision on the DES as a regulated utility, and
3. A positive business case buoyed by Federal/Provincial funding,

it is recommended that Halifax Water proceed forward with the next activities to create the DES formally as a regulated utility.

The key utility development activities to be undertaken include:

- Completion of a DES cost of service study and rate structure model,
- Development of operating procedures and business processes
- Establishment of the DES utility regulations, and
- Enhancement of the business case analysis to align with the cost of service model and rate structure.

The DES rate structure and resulting financial analysis will need to be reviewed in greater detail during next steps, and a balance struck between DES energy and demand rates and the projected level of operating surplus. All these activities will be overseen and approved by the Halifax Water Board and the NSUARB.

Project Capital Cost and Funding Requirements

The DES has three components of capital infrastructure:

- DPS,
- Energy Centre (EC) and,
- DPS Lateral and Energy Transfer Stations (DPSL/ETC).

A map of the Cogswell Redevelopment Area, as well as a schematic of the DES (including the DPS, EC, and DPSL/ETC) is provided in Figure 1.



Figure 1 - Cogswell DES Schematic

The first phase of the DES construction involves installation of the DPS. The DPS consists of two large diameter high density polyethylene (HDPE) supply and return pipes (see Figure 2) that will be used to distribute ambient temperature water to the connected buildings. This system will be used to deliver or remove thermal energy to/from each building. The DPS will be installed at the time of the new Cogswell area street construction.



Figure 2 - Cogswell DES HDPE Piping (December 2021)

The remaining development consists of the EC to be constructed at the Halifax WWTF, and the individual DPSLs and ETSSs to be constructed at each building within the Cogswell redevelopment area.

Next Steps

Subsequent to the initiation of the DES capital infrastructure construction and establishment of the DES as a regulated utility, the following activities will be implemented in alignment with the Cogswell Redevelopment project:

- Design and construction of the remaining DES components.
- Develop building design guidelines for all buildings connecting to the DES.

BUDGET IMPLICATIONS

Previously approved funding includes \$15,000 for the DES feasibility study completed in 2016, and \$355,000 including the preliminary and detailed design of the DPS, construction phase services, a municipal by-law review, a developer information package, and the further development of the utility (i.e., business case development, cost-of-service modelling, NSUARB application, etc.). To date, \$272,628 of the total funding approved has been spent.

The following capital funding is required in 2022 to implement near-term capital activities of the DES parallel to the implementation of the HRM Cogswell Redevelopment project:

- Initial capital funding in the amount of \$3,809,199, or \$1,302,780 net to Halifax Water, for the construction of the DPS;
- \$500,000 for the development of the regulated utility; and

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- \$900,000 for the detailed design of the DES EC. The EC design will proceed over the next one to two years, in time for construction in three years. The EC must be ready when the Cogswell Redevelopment project is completed, sometime in 2026.

To date, no formal funding approvals have been granted for DES construction and Halifax Water has been accumulating DES related costs in a work order that will eventually be capitalized as part of the utility plant in service for the DES. The business case and future rates will include a provision to recover the initial cost of internal bridge financing. Halifax Water has sufficient financial capacity to continue internal bridge financing during construction.

ALTERNATIVES

The Board could choose to not approve the requested motion, in which case Halifax Water would be required to rescind the funding agreements with both the Federal and Provincial governments and could be subject to penalties as a result. Failure to approve this motion would also have detrimental financial, schedule and reputational impacts on HALIFAX's Cogswell Redevelopment projected currently underway.

ATTACHMENTS

1. Cogswell DES – Proof of Concept.
2. Cogswell DES – Total Project Cost Estimate.
3. Business Case Analysis dated March 17, 2022.
4. Cogswell DES Feasibility Study – Executive Summary, dated June 16, 2016.

Report Prepared by:

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Jeffrey Knapp, FEC, P.Eng., CEM, CAMP
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On behalf of::

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

Attachment 1 – Cogswell DES Proof of Concept

Background

The Halifax Regional Municipality (HRM) is currently planning the redevelopment of the existing Cogswell Interchange area located in downtown Halifax. HRM has also requested Halifax Water to explore the feasibility of a District Energy System (DES) in the Cogswell area, to be constructed in conjunction with the overall Cogswell redevelopment project. Following on the Cogswell DES Feasibility Study completed by DEC Engineering on behalf of Halifax Water in June 2016, DEC identified an ambient temperature DES as being the most energy efficient and economical versus a conventional high/low temperature DES and other business as usual (BAU) heating and cooling systems.

District energy systems, also called low-carbon thermal energy networks, are systems that distribute thermal energy to multiple buildings in an area or neighbourhood. Conventional high/low temperature DESs typically consist of a larger heating and cooling centre, and a thermal network of insulated pipes connected to a group of buildings. An ambient temperature DES (ATDES) works in much the same way as a conventional DES, with a few exceptions: an ATDES 1) transfers thermal energy to/from multiple buildings via an uninsulated ambient temperature piping loop, with much greater energy efficiency and much lower GHG emissions; 2) has a much smaller energy centre since no larger scale heating or cooling equipment is required; 3) since the DPS uses ambient temperature water, no pipe insulation is required. The proposed Cogswell ATDES will transfer thermal energy to accommodate heating and cooling to the six proposed mixed-use high-rise commercial/residential developments proposed to be constructed within the Cogswell redevelopment area in downtown Halifax.

These types of ambient temperature district energy systems are very common around the world, and also in Canada. They use readily available, proven technologies (e.g. heat exchangers, non-insulated HDPE piping, fittings, industrial heat pumps, water pumps, controls, etc.), are as reliable as any other heating/cooling systems on the market today, and are much more energy efficient than both high/low temperature DESs and conventional heating/cooling systems. The gain in energy efficiency is primarily due to the use of water source heat pumps, which typically have efficiencies in the range of 400% to 500%. Ambient temperature DESs also have very low energy losses due to the much lower temperature differentials between the DES water and the ambient environment. They also act similarly to geo-thermal/geo-exchange systems, in that they allow some energy transfer and storage to the ground surrounding the DES piping systems.

The Cogswell DES will transfer renewable thermal energy between the nearby Halifax Wastewater Treatment Facility's (WWTF) wastewater effluent stream and the new buildings to be built within the Cogswell redevelopment area, thereby offsetting the need to use other forms of non-renewable, fossil fuel based energy (e.g. oil, natural gas, electricity) and their corresponding GHG emissions for the purpose of heating and cooling. The waste and renewable energy contained in wastewater comes from commercial and residential hot water heating, other residential, commercial and industrial processes, wet weather run-off, and through geothermal exchange within the extensive underground wastewater collection system throughout the year. This waste stream can also be used as a heat sink for the purpose of cooling. A schematic of the DES is provided in Figure 1.

Figure 1 - Cogswell DES Schematic

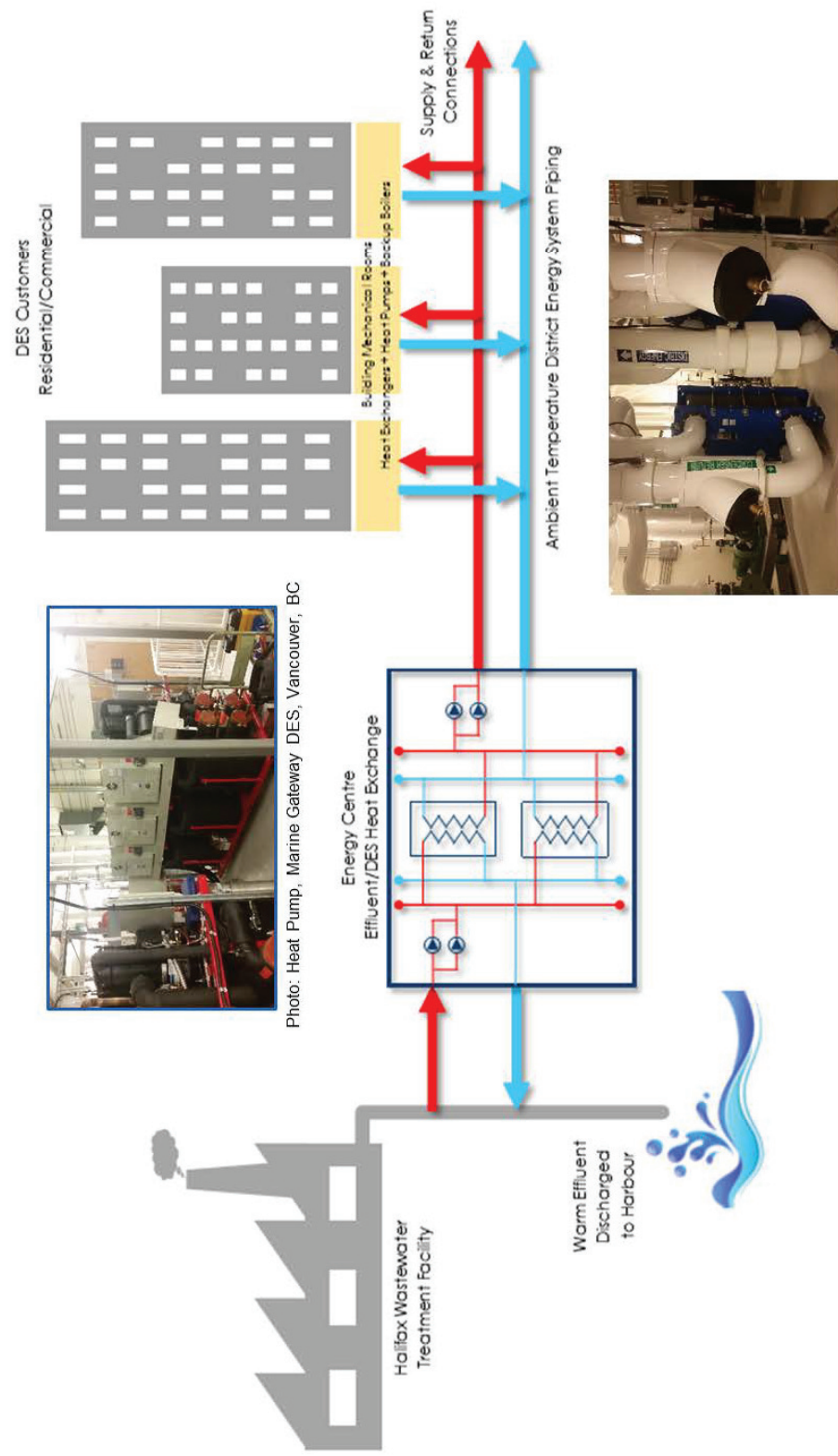


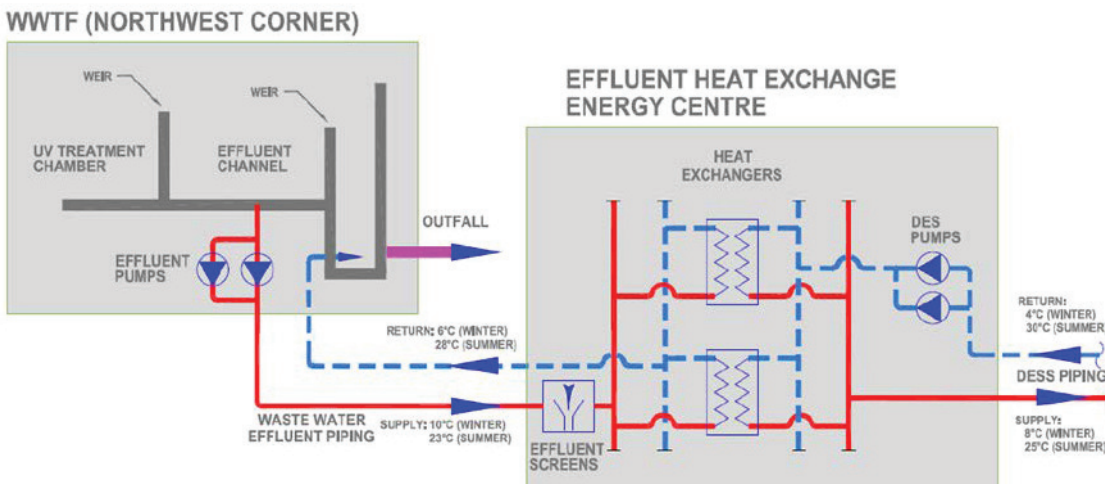
Photo: Heat Pump, Marine Gateway DES, Vancouver, BC

DES Components

The current DES will provide a multi-phased ambient temperature district energy network. The DES will generally include the following technical components: an Energy Center (EC) located at the Halifax WWTF providing heat exchange capacity between the wastewater effluent stream and the DES piping loop; Distribution Piping System (DPS) supply and return pipe loops; DPS laterals (DPSL) connecting each building to the DPS; and Energy Transfer Stations (ETS) located in each building.

The EC is envisioned to be a small building connected to the Halifax WWTF. Its purpose will be to extract effluent from the WWTF's effluent stream, pump it through heat exchangers to transfer thermal energy to/from the DPS, and deliver the effluent back to the WWTF's effluent stream. A schematic of the EC process is provided in Figure 2.

Figure 2 - WWTF/DES Interface



The DPS will be comprised of two large diameter high-density polyethylene (HDPE) pipes, one supply and one return. Ambient temperature water will be circulated throughout the DPS, allowing water to be extracted and used by each connected building. The water will be used to transfer thermal energy to/from the heat exchangers and heat pumps located in each building to provide heating and cooling.

The DPSLs will consist of two smaller diameter HDPE pipes, shut off valves, etc. – one supply and one return, that will be the main connections from the DES to each connected building.

Each EC will include a heat exchanger, piping, valves, etc. as well as an energy transfer meter capable of monitoring and measuring the amount of energy transferred to/from each building. These will be revenue grade meters and will be used for billing purposes.

Benefits of District Energy

The benefits of a DES are varied and significant versus conventional fossil fuel-based heating, ventilation and air-conditioning (HVAC) systems.

Benefits include:

- Flexible building design - The elimination of the conventional or traditional HVAC equipment (i.e. boilers, furnaces, domestic hot water heaters, electric baseboards, cooling towers, or any other heat production equipment) expands the number of possible building design options. Smaller mechanical spaces mean more room that can be used for another purpose.
- Lower operations and maintenance costs - District energy systems have none of the costs normally associated with in-building heating systems, including boilers, multiple storage tanks, and other associated equipment as well as related insurance, maintenance, upgrade, and replacement costs.
- Efficient energy delivery - Centralized production of thermal energy enables highly efficient delivery of heating and cooling to each building.
- Enhanced comfort - Hydronic sources provide a more comfortable, effective heat than can be provided by electric baseboard or duct heaters. The system can also provide cooling in one convenient and cost-effective package.
- Maximum Energy Efficiency - The use of a renewable energy source (warm wastewater effluent) and extremely energy efficient water-to-water heat pumps mean much less energy is required to provide the same amount of energy that would otherwise be provided by conventional heating and cooling systems. This, coupled with energy efficient building design principles, means a much smaller energy footprint, and significantly lower operating costs for developers and tenants. Initial estimates for the Cogswell DES indicate energy reductions of over 70% versus conventional fuel sources.
- Minimal Greenhouse Gas (GHG) Emissions - The DES use of a renewable energy source (warm wastewater effluent) and greater energy efficiency (water source heat pumps) produces far fewer GHG emissions than what would otherwise be produced by traditional fossil fuel-based systems (i.e. natural gas or oil). In addition, as Nova Scotia Power (NSPI) reduces its' GHG intensity through environmental improvements to their generation systems or the addition of more renewable energy generation to the grid, the carbon footprint of the DES will reduce even further. Based on current NSPI GHG intensity levels, estimates for the Cogswell DES indicate GHG emission reductions of between 24% and 74% versus conventional fuel sources and HVAC systems.
- Improved Local Air Quality – Along with the significant reduction in GHG emissions, and no particulate emissions normally seen with some fossil fuels, local air quality is greatly improved.
- Environmental Protection - A DES would significantly contribute to ongoing Provincial and National GHG emission reduction targets.

- **Energy Resilience and Security** – Most of the energy for the DES comes from a local waste and renewable energy source (wastewater effluent) which means long-term energy security. The remainder comes from electricity, which is also known to be a stable and reliable source of energy.
- **Energy System Flexibility** – A DES is an ideal energy sharing system, allowing excess thermal energy from one area of the DES to be used by another. It also opens the door for integrated energy micro-grids using other renewable technologies such as solar hot water or PV (e.g. HRM's Solar City Program), CHP, or integration into other DES energy nodes that may be built within HRM in the future.
- **Energy Price Stability** - The use of a renewable energy source along with extremely energy efficient heat pump technology significantly reduces exposure to fluctuating electricity, gas and oil prices, and minimizes the amount of electrical energy required to satisfy the overall energy demands of the system.
- **Reliable, Proven Technology** – Refrigerant based heat pump technology has been around since the mid-1800's, while ground/water source heat pumps were developed in the late 1940's. Since that time, the technology has evolved to the point that it is now ubiquitous and synonymous with energy efficiency. Heat pumps are now used throughout the world as very energy efficient heat transfer systems in residential, commercial and industrial applications, providing years of reliable service with minimal operating costs.
- **Worry Free Operation and Maintenance** – The proposed Cogswell DES would be owned, operated, and maintained by Halifax Water and its professional staff. As an existing and long-standing regulated utility, Halifax Water is in the unique position to easily provide the capital infrastructure and necessary expertise to reliably operate and maintain the Cogswell DES.
- **Decreased Capital Costs** – With minimal in-building heating and air conditioning equipment, much of the Developer's up-front capital costs are eliminated. The associated space savings frees up valuable real estate that can be used to generate additional revenue.
- **Decreased Operating Costs** – With minimal energy costs, significantly lower energy use, minimal equipment footprints, and the efficiencies gained the lower operating temperature of the system, ongoing operating and maintenance costs are significantly reduced, benefiting both the building owner and the tenants.
- **Improved Architectural Design Flexibility** – With no large mechanical, electrical and HVAC rooms required, and no roof top cooling towers, design flexibility is increased. More valuable real estate is freed up for other uses, including increased revenue generation. Architectural footprints can be made smaller, more attractive, or even freed up for other complimentary renewable energy systems such as solar hot water and solar PV.
- **Improved Marketability & Value of Real Estate** – From a development perspective, there is very little research into whether a DES increases the value of vacant lands. The recent Colliers report, completed for HRM in the fall of 2017, indicates a small increase in land value (1.84%) due to the presence of a DES. More likely, any DES related property valuation improvements would be attributed to the property value a DES brings to the finished buildings that are connected to it. Attributes such as lower operating costs, lower GHG emissions, environmental responsibility, energy rate stability, more energy efficient structures, etc. The ability to market a building as energy efficient, environmentally friendly, and economical will improve the marketability of such a building to potential buyers and tenants.

- Land Conservation and Visual Advantages – No need to build a large energy plant in the Cogswell community. With the exception of a small Energy Centre located at the Halifax WWTF, there would be no other requirements for external facilities. Energy Transfer Stations for each building would be contained within the buildings.
- Greener Future: High density developments that share energy resources make it possible to implement sustainable technologies and preserve energy options for the future. Integration into exciting and valuable programs such as HRM's Solar City Program, the Province's Solar PV program, and other renewable energy sources would be possible.
- Net-Zero Ready – A DES is ideally suited to integrate with innovative building construction techniques such as Passive House designed buildings, and Net-Zero buildings that produce as much energy as they consume.

It should be noted that most if not all of the DES installations in Canada, the US, Europe and abroad have all seen most if not all of the benefits mentioned above. More specifically, a number of wastewater based DESs have been in operation for some time, and continue to provide these economic and environmental benefits to the communities in which they've been deployed. The same can be expected for the Halifax Regional Municipality with the implementation of the Cogswell community DES, and any others that are deployed in the future.

Alternative Technologies

The feasibility study completed in 2016 included an extensive technical and economic review of other more traditional HVAC technologies and energy sources that could be used in place of a DES. The conventional energy sources and HVAC technologies selected were those that are "Business-as-Usual" (BAU) options for the proposed buildings. These BAU options included:

1. BAU 1 - Electricity
 - Fan coils in residential and commercial spaces with integral electric heater and chilled water coil.
 - Insulated 2-pipe system providing chilled water to fan coils.
 - A central chiller and cooling tower.
 - An 80% efficient gas fired make-up air (MUA) unit for corridor pressurization of the residential levels.
 - An 80% efficient central gas fired domestic hot water (DHW) heating system for the residential and commercial spaces.
 - Sub-metering systems to track the amount of chilled water and DHW delivered to commercial vs residential areas.
2. BAU 2 - Natural Gas
 - Standard efficiency water-to-air heat pumps in residential and commercial spaces.
 - Non-insulated 2-pipe system for heat pumps.
 - An 80% efficient central boiler plant for the heat pump loop and DHW heating for the residential and commercial spaces.
 - An ASHRAE rated minimum efficiency cooling tower.

- An 80% efficient gas fired MUA unit for corridor pressurization of the residential levels.
- Sub-metering systems to track the amount of heat pump loop water and DHW delivered to commercial vs residential areas.

3. BAU 3 - Heating Fuel Oil

- Standard efficiency water-to-air heat pumps in residential and commercial spaces.
- Non-insulated 2-pipe system for heat pumps.
- An 80% efficient central oil boiler plant for the heat pump loop, the DHW heating for the residential and commercial spaces, and for the hydronic MUA unit for corridor pressurization of the residential levels.
- An ASHRAE rated minimum efficiency cooling tower.
- Sub-metering systems to track the amount of heat pump loop water, heating water for MUA unit and DHW delivered to commercial vs residential areas.

4. Ambient Temperature District Energy System

- Standard efficiency water-to-air heat pumps in residential and commercial spaces.
- Insulated 2-pipe system for heat pumps.
- A hydronic MUA unit for corridor pressurization of the residential levels.
- A central plant with water-to-water heat pumps to generate heating water for the MUA unit serving the residential levels and for pre-heat of the DHW for the residential and commercial spaces, with 95% efficient condensing gas boilers for the final stage of DHW heating and for back-up heating of the heat pump loop (in case of DES interruption).
- Sub-metering systems to track the amount of heat pump loop water, heating water for MUA units and DHW delivered to commercial vs residential areas.

The earlier feasibility study completed an evaluation on each of the above energy sources to determine the energy cost and GHG emissions resulting from the delivery of a single unit of space heating and cooling energy. Findings shown in Table 1 and Table 2 demonstrates that a wastewater heat recovery DES can deliver heating and cooling energy with significantly lower fuel use and operating cost than other BAU heating and cooling energy sources.

The feasibility study also compared ambient temperature systems to high/low temperature systems. In the context of the Cogswell project, the ambient temperature system makes the most sense, given the close proximity to the WWTF, and the small scale of the Cogswell redevelopment project. If district energy were to be considered for the larger downtown core, the high/low temperature type of system would also make sense, augmented by the significant levels of energy available in the WWTF effluent stream.

Table 1 - Halifax Heating Energy Source Comparison

	Electric Baseboard	Air Source Heat Pump	Gas Hydronic Heating	Oil Hydronic Heating	DES Heating
Energy Use (MWh)	1.00				
Fuel Source	Electricity	Electricity	Natural Gas	Heating Oil	Electricity/DES
Efficiency	100%	240%	85%	80%	420%
Fuel Use (MWh)	1.00	0.42	1.18	1.25	0.24 (Electricity) + 0.76 (DES)
Fuel Rate (\$/MWh)	\$162.15 ¹	\$162.15 ¹	\$75.00 ²	\$121.68 ³	\$162.15 (Electricity)
Fuel Cost (\$/MWh)	\$162.15	\$67.56	\$88.24	\$152.10	\$38.61
Fuel GHG Intensity (tCO ₂ e/MWh)	0.630	0.630	0.180	0.250	0.630 (Electricity) 0.013 (DES)
GHG Emissions (tCO ₂ e/MWh)	0.630	0.262	0.212	0.313	0.161

Table 2 - Halifax Cooling Energy Source Comparison

	Air Source Heat Pump	WSHP Loop w/ Cooling Tower	WSHP w/ DES
Space Cooling (MWh)	1.00		
Fuel Source	Electricity	Electricity	Electricity/DES
Efficiency (EER)	12.5	12.4 ⁴	22.0
Fuel Use (MWh)	0.27	0.28	0.16 (Electricity) + 1.16 (DES)
Fuel Rate (\$/MWh)	\$162.15	\$162.15	\$162.15 (Electricity)
Fuel Cost (\$/MWh)	\$43.78	\$45.40	\$25.94
Fuel GHG Intensity (tCO ₂ e/MWh)	0.630	0.630	0.630 (Electricity) 0.013 (DES)
GHG Emissions (tCO ₂ e/MWh)	0.170	0.176	0.115

¹ Rate is based on 2022 NSPI data, Rate Class 2.

² Rate is based on Heritage Gas data, Rate Class 1A.

³ Rate is based on the 2021/22 heating season average cost of heating fuel oil in the Halifax area.

⁴ Assumes an EER of 14 plus impact of cooling tower fan energy.

Tables 1 and 2 demonstrate that a wastewater heat recovery DES can deliver energy with significantly lower energy/fuel use than other typical heating and cooling sources. These tables provide a high-level analysis that does not include any costs for the DES energy which would be measured at a thermal energy meter and billed to the customer. Also not included is the capital, operational, and maintenance cost of each option. DES energy costs are included in the financial model for the DES utility provided in Attachment 4, and the present value of total cost calculations for the customer and utility described in the Business Case Modelling Section.

Proven Technology

Modern ambient temperature DESs utilize conventional, proven technologies such as pumps, valves, heat exchangers, and water-to-water and water-to-air heat pumps. All of these technologies have been available for well over 15 years and have proven to be cost effective and reliable.

Examples of similar Canadian wastewater effluent or geo-exchange based DESs are as follows:

1. Blatchford Energy, Edmonton, AB: [Blatchford Energy](#)
2. Saanich ATDES, Victoria, BC: [Saanich ATDES](#)
3. Lulu Island Energy, Richmond, BC: [Lulu Island Energy](#)
4. Whistler, BC: [Cheakamus Crossing DES](#)
5. Marine Gateway, Vancouver, BC: [Marine Gateway DES](#)

ITEM #5.2

Attachment 2 – Cogswell DES – Total Project Cost and Cash Flow Estimate

Capital Funding	Previous	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	Future	Total
Distribution Piping System (DPS)										
DPS Total	260,013	367,821	1,587,339	1,588,394	5,632	-	-	-	-	3,809,199
DPS Federal Portion	-	141,690	611,467	611,873	2,170	-	-	-	-	1,367,200
DPS Provincial Portion	-	118,063	509,505	509,843	1,808	-	-	-	-	1,139,219
DPS HW Net	260,013	108,067	466,367	466,677	1,655	-	-	-	-	1,302,780
Energy Center (EC)										
EC Total	-	134,096	1,568,586	4,567,694	967,874	-	-	-	-	7,238,250
EC Federal Portion	-	57,120	658,960	1,888,320	392,400	-	-	-	-	2,996,800
EC Provincial Portion	-	47,595	549,078	1,573,443	326,967	-	-	-	-	2,497,083
EC HW Net	-	29,381	360,548	1,105,931	248,507	-	-	-	-	1,744,367
Distribution Piping System Laterals (DPSL)										
DPSL Total	-	-	-	-	-	64,597	65,889	67,207	218,354	416,046
DPSL Federal Portion	-	-	-	-	-	20,400	20,800	21,200	-	62,400
DPSL Provincial Portion	-	-	-	-	-	16,998	17,332	17,665	-	51,995
DPSL HW Net	-	-	-	-	-	27,199	27,757	28,342	218,354	301,651
Energy Transfer Stations (ETS)										
ETS Total	-	-	-	-	-	349,685	356,678	363,812	1,182,023	2,252,198
ETS Federal Portion	-	-	-	-	-	137,600	140,400	143,200	-	421,200
ETS Provincial Portion	-	-	-	-	-	114,655	116,988	119,321	-	350,964
ETS HW Net	-	-	-	-	-	97,430	99,290	101,291	1,182,023	1,480,034
Utility Development (UD)										
UD Total	12,665	500,000	482,000	391,000	252,000	196,000	53,000	3,000	-	1,889,665
UD Federal Portion	-	200,000	192,800	156,400	100,800	78,400	21,200	1,200	-	750,800
UD Provincial Portion	-	166,650	160,651	130,320	83,992	65,327	17,665	1,000	-	625,604
UD HW Net	12,665	133,350	128,549	104,280	67,208	52,273	14,135	800	-	513,261
Project Totals										
Project Total	272,678	1,001,917	3,637,925	6,547,088	1,225,506	610,282	475,567	434,019	1,400,377	15,605,358
Project Federal Portion	-	398,810	1,463,227	2,656,593	495,370	236,400	182,400	165,600	-	5,598,400
Project Provincial Portion	-	332,308	1,219,233	2,213,607	412,766	196,980	151,985	137,986	-	4,664,865
Project HW Net	272,678	270,798	955,465	1,676,888	317,370	176,902	141,182	130,433	1,400,377	5,342,093

Attachment 2 – Cogswell DES – Total Cost by Project Element

Cost Element	Rate	Distribution Piping System (DPS) ¹	Energy Center (EC)	DPS Lateral (DPSL)	Energy Transfer Stations (ETS)	Total Cost
Construction	-	\$3,353,025	\$4,372,137	\$251,306	\$1,360,401	\$9,336,869
Owner's Overheads	1%	\$50,296	\$43,721	\$2,513	\$13,604	\$110,134
Engineering	16%	\$260,013	\$699,542	\$40,209	\$217,664	\$1,217,428
Contractor OH&P	10%	\$0	\$437,214	\$25,131	\$136,040	\$598,384
Sub-Total		\$3,663,334	\$5,552,614	\$319,159	\$1,727,709	\$11,262,816
Contingency	25%	\$0	\$1,388,153	\$79,790	\$431,927	\$1,899,870
Sub-Total w/ Contingency		\$3,663,334	\$6,940,767	\$398,948	\$2,159,637	\$13,162,686
Net HST	4.286%	\$145,866	\$297,481	\$17,099	\$92,562	\$553,009
Total Cost		\$3,809,200	\$7,238,249	\$416,047	\$2,252,199	\$13,715,695

Notes:

1) Pricing for the DPS is based on a firm quote from HRM. 1.5% OH is used. No Contractor OH&P or Contingency applied.

COGSWELL DES FEASIBILITY STUDY

DEC PROJECT#: D16-009

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LIST OF ABBREVIATIONS

COP:	Coefficient of Performance
DES:	District Energy System
DHW:	Domestic Hot Water
DHS:	District Heating System
DND:	Department of National Defense
DPS:	Distribution Piping System
ETS:	Energy Transfer Station
EUI:	Energy use intensity
HDPE:	High-density Polyethylene
HRM:	Halifax Regional Municipality
HVAC:	Heating Ventilation and Air Conditioning
HW:	Halifax Water
NPV:	Net Present Value
PV:	Present Value
ROE:	Return on Equity
ROI:	Return on Investment
UARB:	Utility and Review Board
UV:	Ultraviolet
WACC:	Weighted Average Cost of Capital
WWTF:	Waste Water Treatment Facility

LIST OF REFERENCES

Ekistics Planning and Design. *Cogswell Transformed*, April 2014.

Province of Nova Scotia. *Public Utilities Act*. RS 1989 with amendments.

Province of Nova Scotia. *Municipal Government Act*. 1998 c. 18, s. 1.

Nova Scotia Utility and Review board. "Halifax Regional Municipality District Energy Systems."
Letter to Martin Ward, HRM. March 30, 2010.

ACKNOWLEDGEMENTS

Halifax Water would like to recognize the contributions of QUEST and the Nova Scotia Department of Energy for their contributions to the preparation of this report.



EXECUTIVE SUMMARY

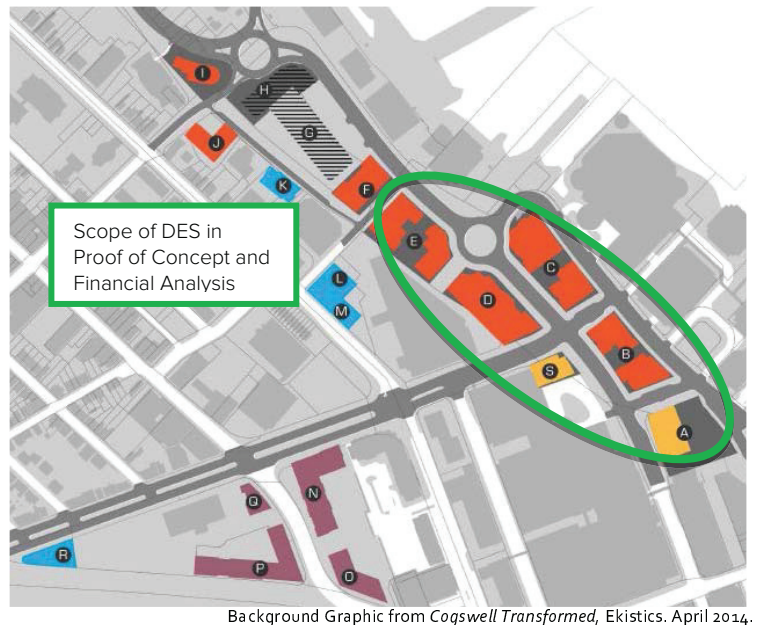
This study has developed a concept design for a wastewater heat recovery based district energy system (DES) that recovers waste heat from the Halifax Wastewater Treatment Facility (WWTF) effluent stream and provides heating, cooling, and domestic hot water to six blocks of buildings in the Cogswell Redevelopment.

A number of technologies exist for extracting thermal energy from wastewater — both untreated sewage and effluent from treatment plants. This report has presented technology options for effluent heat recovery and has selected plate frame heat exchangers as the most cost effective, space conservative, and energy efficient heat exchange technology.

The proposed DES concept works by direct heat exchange between the effluent and ambient temperature water running through the DES piping. Ambient temperature water is piped to mechanical rooms in each building where heat pumps are used to extract heat from the water and provide high-grade thermal energy for building loads such as domestic hot water (DHW) pre-heating and make-up-air heating. Water source heat pumps in each residential or commercial unit provide space heating and cooling. In the winter, energy is transferred from the DES to the building water-source heat pump (WSHP) loop; in summer, excess energy from cooling is rejected to the DES from the WSHP loop through a heat exchanger.

A group of six blocks (green circle) in the Cogswell Redevelopment plan were selected for connection to the DES and development of a business case. The six blocks were chosen because of their central location, high density, and close proximity to the WWTF. As the largest blocks proposed for development under the Cogswell plan, these blocks present the greatest opportunity for a positive business case. A plan showing the proposed blocks and DES concept is provided at right.

The six identified buildings (blocks “A” through “E” and “S”) have a combined expected floor area of 162,000m² which is assumed to be 8% retail, 15% office, and 77% residential. Based on energy use intensities for Halifax, these buildings are expected to have a peak heating demand of 12 MW and a peak space cooling demand of 7.8MW.



Background Graphic from *Cogswell Transformed*, Ekistics. April 2014.

Figure 1: Cogswell DES Concept Service Area

The capacity of the WWTF effluent for heat exchange was assessed. The effluent 3-year average monthly temperature ranges from a low of 11.5°C in March to a high of 22.3°C in September. Minute by minute flow rate data was charted and a minimum night time dry-weather effluent flow rate of 2,000 m³/h was observed. Average dry weather flow rates of 3,500 m³/h were observed. The heat capacity of the effluent at various flow rates and temperatures is presented in Table 1.

Table 1: Effluent Heat Capacity

Effluent Temperature	Heat Capacity @ Flow	
	2,000 m3/h	3,500 m3/h
14 °C	17 MW	31 MW
12 °C	13 MW	22 MW
10 °C	8 MW	14 MW
8 °C	3 MW	6 MW

The effluent heat capacity table shows, even with below average effluent temperature of 10°C (a condition which typically occurs less than 5 days per year) and worst-case dry-weather flow, the effluent still contains **8 MW** of heating capacity, based on maintaining a minimum effluent temperature of 6.5°C. At the average January condition (12°C and 3,500 m³/h) the effluent contains **over 22 MW** of heating capacity. Based on this analysis, it is expected that the WWTF effluent would be sufficient to meet the proposed Cogswell DES thermal energy needs over 99% of the year. Under the proposed concept, the mechanical room in each building would be provided with a natural gas boiler for peaking and backup in order to meet the customer heating loads if the DES energy is not available.

A comparison of DES to other typical heating sources was provided. Table 2 shows that DES can provide a unit of heat with significantly lower fuel inputs and GHG emissions than other heating options.

Table 2: Halifax Heating Energy Sources Comparison

	Electric Baseboard	Air Source Heat Pump	Gas Hydronic Heating	Oil Hydronic Heating	DES Heating
Space Heating	1 MWh				
Fuel Source	Electricity	Electricity	Natural Gas	Heating Oil	Electricity/DES
Efficiency	100%	240%	85%	80%	420%
Fuel Use	1.00 MWh electricity	0.42 MWh electricity	1.18 MWh Nat. Gas	1.25 MWh Oil	0.24 MWh (electricity) 0.76 MWh (DES)
Fuel Rate (\$/MWh)	\$149.54	\$149.54	\$50.40	\$69.70	\$149.54 (electricity)
Fuel Cost (\$/MWh delivered heat)	\$149.54	\$62.81	\$59.47	\$87.13	\$35.60
Fuel GHG Intensity (tCO ₂ e/MWh)	0.652	0.652	0.180	0.250	0.652 (electricity) 0.013 (DES)
GHG Emissions (tCO ₂ e/MWh delivered heat)	0.652	0.274	0.212	0.313	0.166

Capital and operating costs of the DES concept were compared against three possible “business-as-usual” (BAU) systems for the six blocks. The BAU options considered were:

- Electric heat
- Water-source heat pump (WSHP) with natural gas heat
- WSHP with oil heat

The fuel costs of the three BAU cases were compared to the fuel costs of the DES option and are presented in Table 3.

Table 3: Fuel Input Costs for DES and 3 BAUs

Location	BAU 1 – Electric	BAU 2 – Nat. Gas	BAU 3 - Oil	DES
Energy Centre	-	-	-	\$ 44,000
Bld. Mechanical Rooms	\$ 640,000	\$1,098,000	\$1,495,000	\$ 274,000
Customer HVAC System	\$2,039,000	\$ 579,000	\$ 579,000	\$ 601,000
Total	\$2,679,000	\$1,677,000	\$2,074,000	\$919,000

The DES option is shown to have significantly lower fuel use and fuel cost among the three options based on 2016 energy rates—**nearly 50% lower energy cost than the lowest cost BAU option** (natural gas boilers).

The fuel costs for the DES and BAU options are based on three year average natural gas and heating oil prices in Halifax and current Nova Scotia Power electricity prices as detailed in Table 4.

Table 4: Commodity Price Assumptions

Commodity	Rate
Electricity, Rate 2, Domestic	\$149.54 /MWh
Electricity, Rate 11, General (blended rate)	\$121.00 /MWh
Natural Gas, Rate Class 1 (DES)	\$22.60 /GJ plus \$22 /month
Natural Gas, Rate Class 2 (BAU)	\$14.00 /GJ plus \$563 /month
#2 Heating Oil	\$0.75 /L

Class D capital cost estimates for the DES Concept are presented in Table 5 and compared to the cost of an equivalently sized BAU system (natural gas boilers) for the six Cogswell blocks. Capital costs presented include soft costs but exclude HST and contingency.

Table 5: Total Capital Cost for DES and BAU (\$'000s)

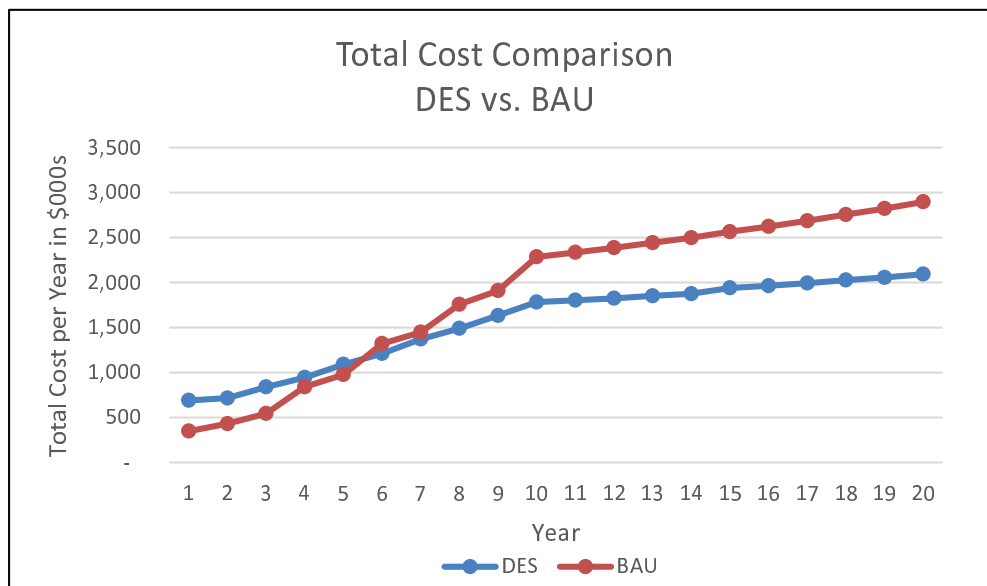
Systems / Components	DES	BAU 2
1. ENERGY CENTRE	\$ 3,955	-
2. DISTRIBUTION PIPING SYSTEM	\$ 1,326	-
3. ENERGY TRANSFER STATIONS IN (6) BLOCKS	\$ 762	-
4. BUILDING MECHANICAL ROOMS IN (6) BLOCKS	\$ 5,956	\$ 5,489
5. CUSTOMER BUILDING HVAC SYSTEM	\$ 27,763	\$ 27,207
TOTALS	\$ 39,762	\$ 32,696

The DES option has a capital cost premium of **\$7.1 million** over the natural gas boiler BAU scenario. The majority of this capital cost premium is due to the cost of the energy centre, distribution piping system (DPS), and energy transfer stations (ETSs) for the 6 Cogswell blocks. The estimated cost of the customer heating ventilation and air conditioning (HVAC) systems is similar under both DES and BAU options.

A 20 year financial analysis for the proposed DES concept has been created. It is assumed, initially, that the DES including the energy centre, distribution piping system, and building mechanical rooms in the six blocks would be owned and operated by Halifax Water as a regulated thermal energy utility. The utility sells thermal energy to the customer at a set rate (\$/kWh).

The total cost of owning and operating the DES was compared to the total cost of owning and operating an equivalent BAU system (gas boiler and cooling tower) for the six Cogswell buildings over 20 years. The present value of the total costs of the DES is \$19.8M which is less expensive than the present value of total cost of the BAU at \$23.2M. The annual total costs for the first 20 years of the project are presented in Figure 2 for both DES and BAU.

Figure 2: Total Cost Comparison by Year



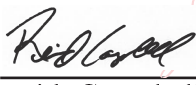
This demonstrates that, over the course of a 20 year analysis, the DES can be delivered more cost effectively than the BAU while also creating a valuable non-tax based, revenue-generating asset and also lowering GHG emissions of the community. An initial DES thermal energy rate set at \$0.079/kWh of thermal energy would cover the DES utility costs and also be lower than the total cost per kWh for an equivalent BAU system at \$0.092/kWh.


At these rates and based on initial assumptions, the DES utility could be created with a positive net present value (NPV) of \$2.28M and in internal rate of return (IRR) of 5.7%. The financial modelling indicates that the utility would achieve positive cumulative cash flow in year 17 (5 years after the 6th Cogswell building is complete).

This is a very positive business case for a renewable energy utility. The proposed DES concept could be delivered successfully at Cogswell and HW could create a thermal energy utility that provides renewable energy to customers at lower cost than the BAU system.

The business case for the DES depends on developers connecting to the system. Connection to the DES should be made mandatory for buildings in the identified service area through use of restrictive covenants, developer agreements, or municipal by-laws put in place by Halifax Regional Municipality. Mandatory connection protects the business case for the utility and makes energy rates lower for all connected customers.

TO: Becky Kent, B.A., Chair and Members of the Halifax Regional Water Commission Board

SUBMITTED BY:  Digitally signed by Reid Campbell
Date: 2022.03.18 09:34:59 -03'00'
Reid Campbell, M.Eng., P.Eng., Director, Engineering & Technology Services

APPROVED: Cathie O'Toole  Digitally signed by Cathie O'Toole
Date: 2022.03.17 21:52:31 -03'00'
Cathie O'Toole, MBA, FCPA, FCGA, ICD.D, General Manager

DATE: March 11, 2022

SUBJECT: **Application for Funding for Halifax Water Projects – Investing in Canada Infrastructure Program – Green – Environmental Quality Stream**

ORIGIN

- Integrated Resource Plan
- February 1, 2022 Announcement from Minister John Lohr, Municipal Affairs and Housing

RECOMMENDATION

It is recommended that the Halifax Water Board authorize staff to apply for funding from the Green – Environmental Quality Stream of the Investing in Canada Infrastructure Program (ICIP) in the current call form nominations, set to close on April 1, 2022 for the following projects:

- Sawmill River Daylighting/Renewal Phase 2
- Lake Major Pumping Station Renewal and New Intake

BACKGROUND

Periodically, the Federal and Provincial governments sign agreements to jointly fund municipal infrastructure projects. The current program is led by Infrastructure Canada and the Nova Scotia Department of Housing and Municipal Affairs. The current funding program is called the Investing in Canada Infrastructure Program. The program has several streams, each with different criteria.

On February 1, 2022, Minister John Lohr announced that the Nova Scotia Department of Housing and Municipal Affairs (HMA) would be accepting applications under the Green – Environmental Quality Stream of the ICIP program with applications closing on April 1, 2022.

DISCUSSION

Under the ICIP program, the senior levels of government fund approved projects up to 73.33% of eligible projects costs. This call of the program will be funding projects totaling \$90 million across Nova Scotia. Halifax Water is permitted to submit two projects on a prioritized list of projects endorsed by Halifax Regional Council which will also include two projects proposed by Halifax. This list of four projects, including the two Halifax Water projects discussed here will be submitted to Halifax Regional Council on March 22, 2022 seeking their endorsement.

Eligible projects in this call for applications include:

- Wastewater and stormwater projects focused on wastewater treatment plants, conveyance systems and stormwater (projects that result in compliance with relevant provincial regulations and requirements are given priority).
- Drinking water projects focused on water treatment facilities and distribution systems (projects that resolve long-term drinking water advisories or result in drinking water that meets or exceeds the relevant provincial standards are given priority).
- Solid waste and remediation projects focused on diverting materials from solid waste management facilities by increasing capacity to dispose of materials or remediate contaminated sites.

Halifax Water projects fall under the first and second criteria while Halifax projects fall under the first and third criteria.

In selecting projects to put forward, staff considered projects that will best meet program criteria. The following two projects are in staff's opinion projects which meet these criteria and are of a size where the project funding requested will a meaningful difference in Halifax Water's ability to fund capital project and at a reasonable scale within the overall program. Further, both of these projects scored high in Halifax Water's capital project prioritization methodology for reasons of meeting compliance requirements, alignment to strategic priorities, support of organizational values, and impact to the system and service.

The two projects proposed are described as follows:

1. Sawmill River Daylighting/Renewal Phase 2

The Sawmill River Daylighting project, Phase 2, Irishtown Road to Halifax Harbour is an integrated project that will provide flood conveyance capacity in central Dartmouth, including climate change effects, restore fish passage between Halifax Harbour and Shubenacadie Lakes

system and integrate with existing park and active transportation features. This stormwater system is the major flood route between Lake Banook and Halifax Harbour and serves a large urban watershed of 1500 hectares.

The project will daylight approximately 300 m of existing buried storm sewer and will be sized to convey the major flood considering climate change effects and extreme weather events. The project will restore fish passage and access to habitat in the Shubenacadie Lakes system. The project will also be integrated with Halifax work including the Canal Greenway Extension, Trans Canada Trail Connections and street works on Alderney Drive and at the Portland Street/Prince Albert Road intersection.

This project has an estimated total cost of \$15.5 million. Exact timing of this project is based on coordinating with other HALIFAX led projects in the vicinity with construction estimated to take 30 weeks over two construction seasons. The total project duration including planning, design and construction is 3 years.

2. Lake Major Pumping Station Renewal and New Intake

This project consists of replacing the existing 1960 vintage pumping station and open forebay intake with a new, energy efficient pumping station and 400 m long submerged intake.

Halifax Water has been experiencing changing water quality due to climate change and the effects of lake recovery from acid rain. As a result the water has increasing levels of colour and organic carbon making it more difficult to treat. Additionally, the Lake Major system has recently experience water use restrictions due to low lake levels. In addition to renewing aging assets with new more energy efficient technology will address these climate driven effects to help provide resiliency against climate change and changing source water quality.

The new intake will access water from deeper in the lake. This will provide resiliency against low lake levels and the planned multi-port intake will ensure a more consistent quality of raw water, easing the treatment challenge. The provision of bar racks and mechanical travelling screens will help protect the station and the water supply from common events such as fish migration and water quality disruptions caused by adverse weather which can impair the ability of the station to supply the treatment plant.

This project has an estimated cost of \$17.3 million. Design work is scheduled to begin later this year with construction completed in late 2026.

BUDGET IMPLICATIONS

Both projects are identified in Halifax Water's Integrated Resource Plan and are included in the current five-year capital budget. Some preliminary work funding has been approved in the current and previous year's capital budget. Most of the funding for these projects is proposed in future

year capital budgets and will be brought to the Halifax Water Board for approval consistent with Halifax Water's capital funding approval policy.

This funding program has been anticipated for some time and the projects proposed have been previously identified as candidates for ICIP funding. As such, ICIP funding has been assumed for these projects in the current business plan and capital budget.

If the projects do not receive the ICIP funding Halifax Water will develop an alternate funding strategy.

ALTERNATIVES

None

ATTACHMENT

Attachment 1 – Sawmill River Phase 2 Location Plan

Attachment 2 – Lake Major Pumping Station Renewal and New Intake Project Location Plan

Report Prepared by:



Digitally signed by Reid
Campbell
Date: 2022.03.18
09:34:23 -03'00'

Reid Campbell, P.Eng.,
Director, Engineering & Technology Services

Financial Reviewed by:



Digitally signed by Allan
Campbell
Date: 2022.03.17
16:15:44 -03'00'

On behalf of:

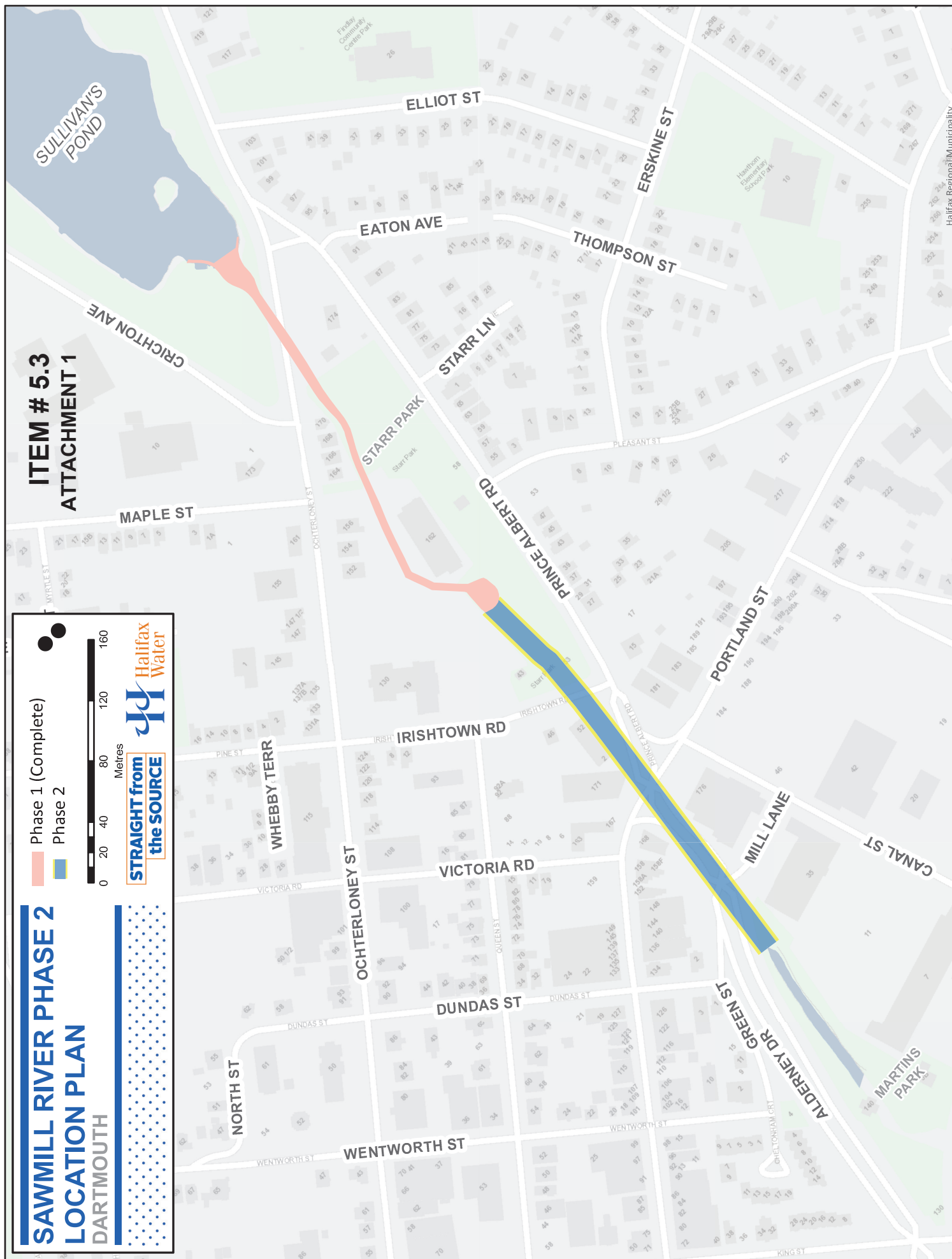
Louis de Montbrun, CPA, CA
Director, Corporate Services/CFO

SAWMILL RIVER PHASE 2 LOCATION PLAN DARTMOUTH

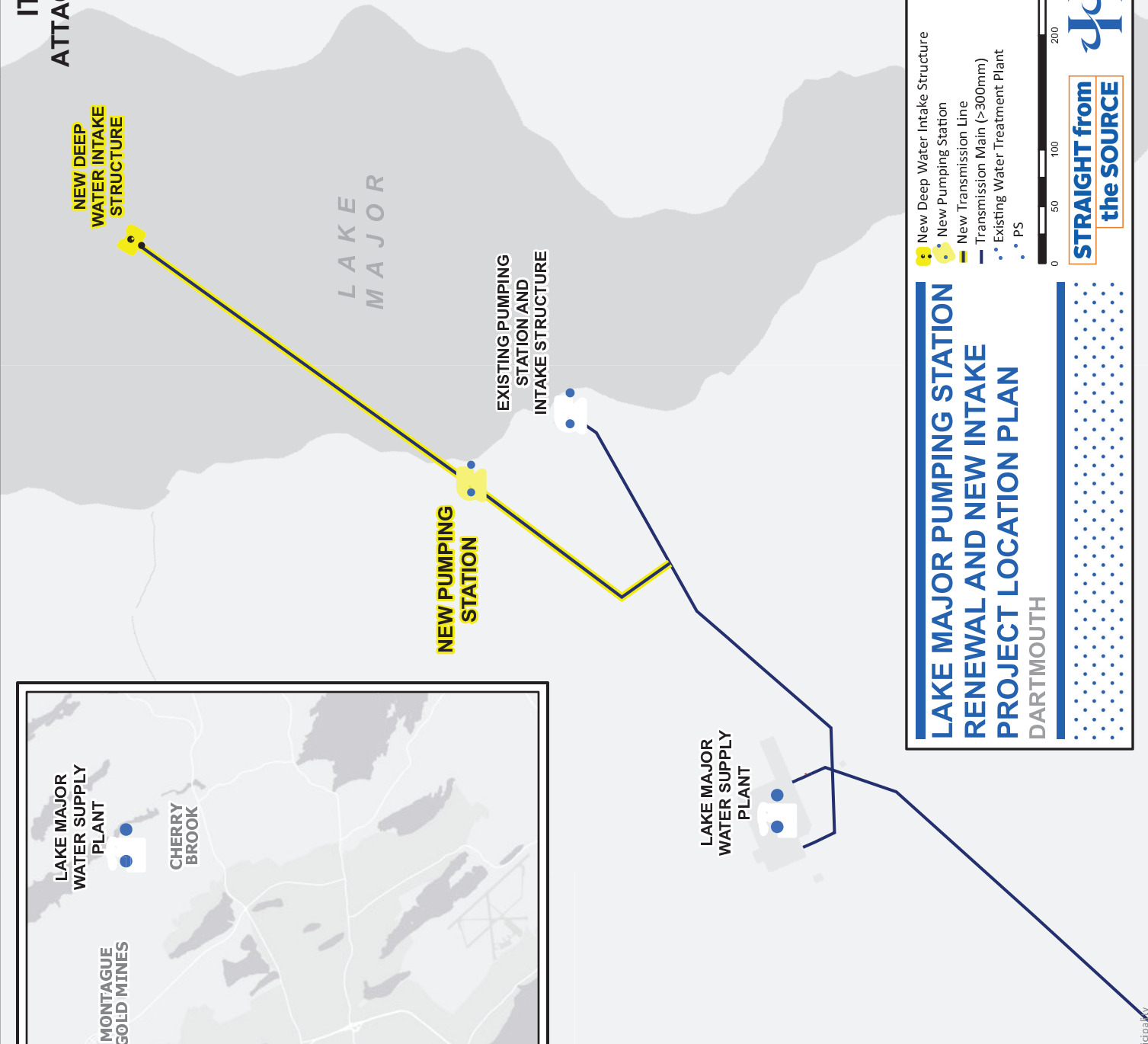
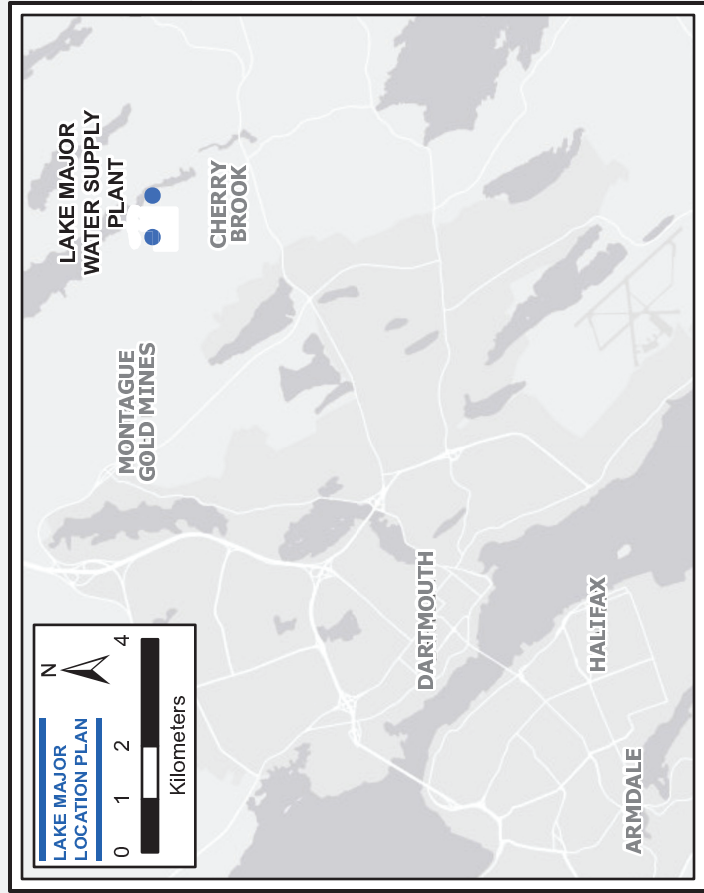
Phase 1 (Complete)
Phase 2



ITEM # 5.3 ATTACHMENT 1



ITEM # 5.3 ATTACHMENT 2



TO: Becky Kent, B.A., Chair, and Members of the Halifax Regional Water Commission Board

SUBMITTED BY: Cathie O'Toole Digitally signed by Cathie O'Toole
Date: 2022.03.18
10:39:09 -03'00'
Cathie O'Toole, MBA, FCPA, FCGA, ICD.D, General Manager

DATE: March 14, 2022

SUBJECT: **Corporate Balanced Scorecard - 2022/23 Program**

ORIGIN:

Annual Corporate Performance Measurement

RECOMMENDATION:

The Board approve:

1. Corporate Balanced Scorecard targets for the 2022/23 fiscal year as detailed in the attached Corporate Balanced Scorecard summary.
2. The Organizational Award Program tied to the outcomes of 12 Organizational Indicators as detailed in the attached presentation.

BACKGROUND:

Halifax Water has been utilizing a Corporate Balanced Scorecard (CBS) to measure performance since 2001. At that time, the CBS was viewed to be an excellent framework to connect the mission of the utility with the everyday activities of staff. The CBS development was very inclusive in 2001 and followed a process to identify Critical Success Factors (CSFs) in support of the mission, establish Organizational Indicators (OIs) to measure performance and set targets for continuous improvement. In March 2002, the Board approved an organizational award program tied to eight OIs which were the most objective and outward looking. This program was well received by staff and ensured that rewards were linked to strategic outcomes. With the transfer of wastewater/stormwater assets from HRM to Halifax Water on August 1, 2007, a broader mission, vision and CBS were developed to ensure it was inclusive of all services provided by the utility.

DISCUSSION:

The mission of Halifax Water is *“to provide world class services to our customers and our environment”*. The statement is simple, recognizes the connection between customers and the environment with the “one-water” mandate, and places the responsibility on employees to make Halifax Water a world class utility.

The vision statement for Halifax Water is:

- *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*

The vision statement expanded on the values and principles of a world class utility in fulfilling its mission and captures the medium to long-term aspirations of Halifax Water. With the vision statement developed, staff then selected the critical success factors that support the mission, and through an interactive process, settled on the following:

- 1. High Quality Drinking Water**
- 2. Service Excellence**
- 3. Responsible Financial Management**
- 4. Effective Asset Management**
- 5. Safety and Security**
- 6. Regulatory Compliance**
- 7. Environmental Stewardship**
- 8. Motivated and Satisfied Employees**

There are OIs established for each CSF to enable performance measurement and establishment of targets. Each year, the OIs are reviewed and refined based on operational objectives and approved budgets.

The critical success factors supporting the mission and vision of Halifax Water have not changed, but this year they will be presented to employees and the public in a way that aligns with the four strategic pillars approve in the 2022/23 Business Plan.

Changes proposed for 22/23 OI Targets

1. The measurement of Lost Time Incidents has been changed to align with industry standards. Halifax Water worked 777, 866 hours from April 1st, 2021 to Dec. 31st, 2021 with an average of 547 employees. This equates to a LTIR of 2.06. [LTIR: $8 \times 200,000 / 777,866 \text{ hours} = 2.06$ (lost time)]. It is recommended to target a 0.5 reduction each year for the next 4 years, with the ultimate goal of eventually establishing a target of 0.5 or less lost time incidents, consistent with world class companies.

Changes made last year (21/22)

1. The Customer Satisfaction target was increased from 90% to 95%. Maintaining this level of customer satisfaction will be challenged by stormwater service expansion, a rate application hearing.
2. The target percentage of public health and environmental regulatory infractions was simplified to focus on infractions resulting in a summary offense tickets. It formerly included written Ministerial Orders (Warnings or Directives) or Prosecutions. The rule set and process for summary offense tickets is clearly defined and captures issues which may also result in Ministerial Orders or Prosecutions.
3. The target for 21/22 capital expenditures (% of budget spent by end of fiscal year) was adjusted downward from 80%-90% to 70% -80%. This is still very aggressive and is not currently achievable.

The attached Corporate Balance Scorecard Summary identifies the CSFs and OIs for 2022/23, as well as a projection of actual results for 2021/22. Final results will be available after completion of the 2021/22 fiscal year audit and will be reported to the Halifax Water Board at the June Board meeting.

Consistent with prior years and the methodology approved by the Halifax Water Board, the most objective OIs have been considered for the organizational award program. Of the 30 OIs detailed in the attachment, 12 are recommended for inclusion in the award program. These 12 OIs are reflective of seven CSFs which are critical to our mission and the most objective and outward looking. The recognition of an organizational award hinges on a minimum score of 7.0 to give a passing grade out of a maximum score of 12.0. Funds for the award program are connected to the operating expense to revenue ratio being below the target for the fiscal year. In this regard, if the operating expense to revenue ratio is met, funds are already embedded in the operational budget. The Operating Expense to Revenue ratio OI has been modified this year to reflect a target that incorporates the equivalent of \$2 million in expense reduction.

The targets for these OIs are meant to be stretch goals, such that the utility is pushing for both efficiency and effectiveness in its service delivery. In many cases, the improvements in efficiency will realize enough savings to pay for the award program itself. The water loss control initiative is a prime example of how the utility has realized gains in efficiency with financial savings in the

order of \$650,000 per year. In keeping with the cost containment theme, water and wastewater service cost per connection measures under Responsible Financial Management have targets to realize 2% savings compared to the approved operations budget. In addition, under the Environmental Stewardship theme, the utility is expected to reduce energy consumption (and therefore greenhouse gas emissions) as a result of capital improvements. The continuation of the organization award tied to the outcomes of the CBS helps promote a high level of performance and will realize future savings for the utility.

BUDGET IMPLICATIONS


Funds for the Award Program are available with the realization of the operating expense to revenue ratio below the target amount. In this regard, funds would be embedded within the 2022/23 Operations Budget. In many cases, meeting the OI targets will realize direct savings to the utility, improved operational effectiveness, and/or improved customer service.

ALTERNATIVES

None recommended.

ATTACHMENT

Summary Corporate Balanced Scorecard
Corporate Balanced Scorecard 2022/23 Presentation

Report Prepared by:	Cathie O'Toole Cathie O'Toole, MBA, FCPA, FCGA, ICD.D, 902-490-4840	<small>Digitally signed by Cathie O'Toole Date: 2022.03.18 10:39:39 -03'00'</small>
Financial Reviewed by:	 Louis de Montbrun, CPA, CA Director, Corporate Services/CFO Service, 902-490-3685	<small>Digitally signed by Allan Campbell Date: 2022.03.18 10:38:04 -03'00'</small> <i>On behalf of</i>

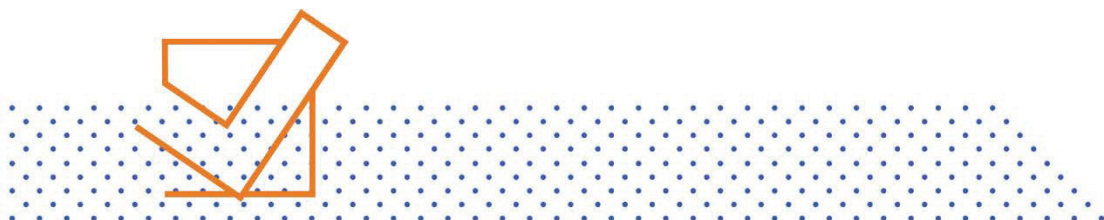
Organizational Indicators	2020/21 Results	2021/22 Target	2021/22 Projection	22/23 Target
High Quality Drinking Water				
Adherence with 5 objectives of Water Safety Plan for all water systems - Percentage of sites achieving targets	76	80	65	80
Bacteriological tests - Percentage free from Total Coliform	100%	99.9%	99.9%	99.9%
Customer satisfaction about water quality - Percentage from customer survey	84%	85%	89%	85%
Service Excellence				
Customer satisfaction with service - Percentage from customer survey	96%	95%*	96%	95%*
Water service outages - Number of connection hours/1000 customers	3612.62	200	191.15	200
Wastewater service outages – Number of connection hours/1000 customers	0.92	4	0.85	4
Average speed of answer – Percentage of calls answered within 20 seconds.	71%	70%	60%	70%
Responsible Financial Management				
Operating expense/revenue ratio percentage	81.5%	82%	79%	83%
Annual cost per customer connection – Water	\$498	\$543	\$537	\$543
Annual cost per customer connection – Wastewater	\$724	\$758	\$741	\$782
Effective Asset Management				
Water leakage control – target leakage allowance of 160 litres/service connection/day *Note 1	193	160-170	N/A	160-170
I&I reduction - Number of inspections to identify private property discharge of stormwater into the wastewater system *Note 2	1316*	900	2365	1200
Peak flow reduction from wet weather management capital projects *Note 3	70 l/sec*	5-10 l/sec*	N/A	5-10 l/sec*
Percentage of time GIS and Cityworks are available	100%	96-98%	99.99%	96-98%
Capital budget expenditures - Percentage of budget spend by end of fiscal year	30.78%	70-80%	30% - 35%	70-80%
Workplace Safety and Security				
Average score on internal safety audits	94.5%	85-95%	96.7%	85-95%
NS Labour and Advanced Education compliance - # of Incidents with written compliance orders	0	0-2	0	0-2
Lost time accidents - Number of accidents resulting in lost time per 100 employees	0.59	1.5-2.0	2.1	3.5
* CHANGE for 22/23: Lost Time Incident Reporting Note 4				
Safe driving - Number of traffic Accidents per 1,000,000 km driven (maximum of 5)	5.5	4	3.36	4



Training - Number of employees trained or re-certified before due date	59%*	80-90%	70%	80-90%
Percentage of completed safety talks	86%	80-90%	58%	80-90%
Regulatory Compliance				
Percentage of public health and environmental regulatory infractions resulting in a summary offense tickets	0	0-2	0	0-2
Percentage of WWTFs complying with NSE approval permits (Project for 21/22 at end of February)	93%	95-100%	96%	95-100%
Environmental Stewardship				
Number of ICI properties inspected/interactions by Pollution Prevention each year	356	500	235	250
Energy management kwh/m3 reduction associated with capital projects	+8%	3%	7.76%	3%
Bio-solids residual handling - % of sludge meeting bio-solids concentration targets	98.6%	92-97%	98.5%	92-97%
Motivated and Satisfied Employees				
Number of arbitrations divided by total number of grievances	0	0	0	0
Percentage of jobs filled with internal candidates	75%	80%	68%	80%
Employee satisfaction survey result	B+	A	B+	A
Average number of days absenteeism	7.54	<7	7.16	<7


Notes:

1. Water leakage control – The final results are not available until year-end, but current data indicates this target will not be met for 2021/22.
2. I&I inspections – The target is proposed to increase to 1200 next year, and the methodology is under review for additional change. Environmental Engineering will be tracking inspections and requests for inspections in greater detail this year to propose a new metric in 2023/24.
3. Peak flow reduction - The Crescent Avenue lining program start was delayed due to a longer than normal NSUARB approval process. As a result the program was completed in October 2021, after the start of the calendar year Q4 data collection through flow monitoring. As a result, it is recommended this target carry forward to 22/23 so that complete a complete Q4 dataset is available to measure the peak flow reduction.
4. Lost Time Incidents - The measurement of Lost Time Incidents will change to align with industry standards. We worked 777, 866 hours from April 1st, 2021 to Dec. 31st, 2021 with an average of 547 employees. This equates to a LTIR of 2.06. We are recommending targeting a 0.5 reduction each year for the next 4 years, and our ultimate goal is to eventually have a target of 0.5 or less lost time incidents, consistent with world class companies. $LTIR: 8 \times 200,000 / 777,866 \text{ hours} = 2.06$ (lost time)






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History of Corporate Balanced Scorecard at Halifax Water

- Halifax Water started a Continuous Improvement Program in 1999
- In 2000, Halifax Water looked for methodology to measure organizational performance that was meaningful
- In 2001 the Halifax Water Board approved a Corporate Balanced Scorecard [CBS], and an Organizational Award Program on March 28, 2002
- CBS ensures all employees focused on strategic outcomes
- Critical success factors [CSFS] are developed in support of the mission
- Organizational indicators [OIs] are used to measure performance



1

The Mission & Vision of Halifax Water

- Halifax Water's mission is **to provide world class services for our customers and our environment**; and the vision of how this will be accomplished is threefold:
 - We will provide our customers with high quality water, wastewater and stormwater service.
 - Through the 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.

2

Critical Success Factors

- High Quality Drinking Water
- Service Excellence
- Responsible Financial Management
- Effective Asset Management
- Workplace Safety and Security
- Regulatory Compliance
- Environmental Stewardship
- Motivated and Satisfied Employees

3

Organizational Indicators

- Organizational Indicators (OI's) are the measures of our performance within each CSF and provide the definition and detail to best understand them. The OI's are organizational, not individual measures.
- The OI's provide both a detailed clarification of the CSF and allow a target or goal for performance to be established and tracked.

4

Organizational Performance Award Program

- Based on a subset [12] of our strategic OI's which are the most objective.
- Program pays for itself by meeting operating expense to revenue ratio target; ratio is reduced from approved budget to accommodate the award program potential.
- It is not a given; a threshold of 7.0 in scoring must be reached in a given year, and the gateway indicators must be met.
- To be eligible for the award, employees must work a minimum of nine months during the fiscal year [April 1st to March 31st]

5

CSF: High Quality Drinking Water

Organizational Indicators	2020/21 Results	2021/22 Target	2021/22 Projected Result	22/23 Target
High Quality Drinking Water Adherence with 5 objectives of Water Safety Plan for all water systems - Percentage of sites achieving targets	76	80	65	80
Bacteriological tests - Percentage free from Total Coliform	100%	99.9%	99.9%	99.9%
Customer satisfaction about water quality - Percentage from customer survey	84%	85%	89%	85%

6

CSF: Service Excellence

Organizational Indicators	2020/21 Results	2021/22 Target	2021/22 Projected Result	22/23 Target
Service Excellence Customer satisfaction with service - Percentage from customer survey *Note 1	96%	95%*	96%	95%*
Water service outages - Number of connection hours/1000 customers *Note 2	3612.62	200	191.15	200
Wastewater service outages – Number of connection hours/1000 customers	0.92	4	0.85	4
Average speed of answer – Percentage of calls answered within 20 seconds.	71%	70%	60%	70%

7

CSF: Responsible Financial Management

Organizational Indicators	2020/21 Results	2021/22 Target	2021/22 Projected Result	22/23 Target
Responsible Financial Management	81.5%	82%	79%	83%
Operating expense/revenue ratio percentage				
Annual cost per customer connection – Water	\$498	\$543	\$537	\$543
Annual cost per customer connection – Wastewater	\$724	\$758	\$741	\$782

- The operating expense/revenue ratio is a gateway indicator. If it is not achieved, there is no organizational award paid out.



8

CSF: Effective Asset Management

Organizational Indicators	2020/21 Results	2021/22 Target	2021/22 Projected Result	22/23 Target
Effective Asset Management				
Water leakage control – target leakage allowance of 160 litres/service connection/day *Note 3	193	160-170	N/A	160-170
I&I reduction - Number of inspections to identify private property discharge of stormwater into the wastewater system *Note 4	1316*	900	2365	1200
Peak flow reduction from wet weather management capital projects *Note 5	70 l/sec*	5-10 l/sec*	N/A	5-10 l/sec*
Percentage of time GIS and Cityworks are available	100%	96-98%	99.99%	96-98%
Capital budget expenditures - Percentage of budget spend by end of fiscal year *Note 6	30.78%	70-80%	30% - 35%	70-80%

9

CSF: Workplace Safety & Security

Organizational Indicators	2020/21 Results	2021/22 Target	2021/22 Projected Result	22/23 Target
Workplace Safety and Security Average score on internal safety audits	94.5%	85-95%	96.7%	85-95%
NS Labour and Advanced Education compliance - # of Incidents with written compliance orders	0	0-2	0	0-2
Lost time accidents -Number of accidents resulting in lost time per 100 employees	0.59	1.5-2.0	2.1	3.5
Safe driving - Number of traffic Accidents per 1,000,000 km driven (maximum of 5)	5.5	4	3.36	4
Training - Number of employees trained or re-certified before due date *Note 7	59%*	80-90%	70%	80-90%
Percentage of completed safety talks	86%	80-90%	58%	80-90%

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CSF: Regulatory Compliance

Organizational Indicators	2020/21 Results	2021/22 Target	2021/22 Projected Result	22/23 Target
Regulatory Compliance Percentage of public health and environmental regulatory infractions resulting in a summary offense ticket *Note 8	0	0-2	0	0-2
Percentage of WWTFs complying with NSE approval permits (Project for 20/21 at end of February)	93%	95-100%	96%	95-100%

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CSF: Environmental Stewardship

Organizational Indicators	2020/21 Results	2021/22 Target	2021/22 Projected Result	22/23 Target
Environmental Stewardship Number of ICI properties inspected by Pollution Prevention each year *Note 9	356	500	235	250
Energy management kwh/m3 reduction associated with capital projects	+8%	3%	7.76%	3%
Bio-solids residual handling - % of sludge meeting bio-solids concentration targets	98.6%	92-97%	98.5%	92-97%



12

CSF: Motivated and Satisfied Employees

Organizational Indicators	2020/21 Results	2021/22 Target	2021/22 Projected Result	22/23 Target
Motivated and Satisfied Employees Number of arbitrations divided by total number of grievances	0	0	0	0
Percentage of jobs filled with internal candidates	75%	80%	68%	80%
Employee satisfaction survey result	B+	A	B+	A
Average number of days absenteeism	7.54	<7	7.16	<7



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Based on a subset of 12 OIs which are the most objective:

Organizational Indicator	Max. Score
Water Quality Master Plan Objectives	1.0
Customer Water Quality Survey Results	1.0
Customer Service Survey Results	1.0
Operating Expense/Revenue Ratio <i>[Gateway Indicator]</i>	1.0
Water Loss Control Reduction	1.0
Peak Flow Reduction <i>(new)</i>	1.0
Percentage of Time GIS and CityWorks are Operational	1.0
# of Lost Time Accidents per 100 Employees	1.0
# of Traffic Accidents per 1,000,000 km	1.0
Percentage of WWTs Compliant with NS Environment Permits	1.0
Energy Management – Water & Wastewater	1.0
Biosolids Residual Handling	1.0
TOTAL MAXIMUM SCORE	12.0

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Employees Organizational Award

The highest possible score is 12.0 [1.0 for each OI]. If HRWC performs well, then everyone should be rewarded as follows:

<u>Total OI Score</u>	<u>OP Award Amount</u>
≥11.0	\$1,000
10.0	\$900
9.0	\$800
8.0	\$700
7.0	\$600
< 7.0	\$0

These values will be pro-rated if a score falls between them.

Example: For the total OP Award score of 8.5, each employee will get an organizational award of \$750.

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Summary

- The track record of the CBS at Halifax Water has been very positive; it drives performance.
- Staff obtains Board approval of the Organizational Award Program on an annual basis
- Organizational Award Program funding is available by meeting the Operating Expense to Revenue Ratio Target.
- The Organizational Award Program is not a given; the organization must score at least 7.0 to have an award, and the gateway indicators must be achieved
- Financial targets are based on the approved operating budget.
- CBS results must be submitted to Halifax Council as part of the annual Accountability Report.



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**Questions or
Comments?**




17

TO: Becky Kent, B.A., Chair, and Members of the Halifax Regional Water Commission Board

SUBMITTED BY:  Digitally signed by
Rochelle Bellemare
Date: 2022.03.18
10:04:34 -03'00'

Rochelle Bellemare
Manager, Human Resources

APPROVED:  Digitally signed by Cathie
O'Toole
Date: 2022.03.18
10:17:22 -03'00'

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

DATE: March 15, 2022

SUBJECT: **Diversity, Equity and Inclusion Framework**

ORIGIN

2020/21 Business Plan

RECOMMENDATION

It is recommended the Board endorse the Diversity, Equity and Inclusion framework goals for 2022/23 – 2024/25 as set out in the report dated March 15, 2022.

BACKGROUND

In 2021 the Halifax Water Board had requested development of a three-year framework for Diversity, Equity and Inclusion activities.

DISCUSSION

Diversity, equity and inclusion outlines the efforts an institution takes to create a more welcoming environment for people of less-privileged identities. Halifax Water has many on-going initiatives, and the proposed initiatives for 2022/23 – 2024/25 are attached.

The purpose of this report is to seek approval for the framework that will guide development of detailed plans and activities regarding diversity, equity and inclusion over the next three years.

The framework proposes some high-level objectives and targets that will enable us to measure success.

The proposed objectives are:

1. Increase the percentage of employees who agree that the workplace reflects a diverse cultural background to 75% by the end of the three-year period.
2. Increase customers' recognition of Halifax Water's Corporate Social Responsibility by 10% by the end of the three-year period.
3. Work towards gender equality and increase employee perception that the workplace reflects gender equality as measured by the employee survey.
4. Increase accessibility at primary Halifax Water work locations compared to status quo.
5. Expand employee knowledge and inclusion of the LBGTQ2S+ community and measure awareness via the employee survey.

Updates on annual activities and progress on diversity, equity and inclusion initiatives have been provided to the Halifax Water Board in June 2020 and June 2021, reporting on the most recently completed fiscal years. A report on accomplishments relative to planned activities for 2021/22 will be submitted to the Halifax Water Board at the June 2022 Board meeting.

ALTERNATIVES

The Board can reject or modify the framework goals.

BUDGET IMPELCATIONS

Funding for initiatives identified in 2022/23 are included within the approved Operating Budget.

Report Prepared by:	<div style="text-align: right;"><small>Digitally signed by Rochelle Bellemare Date: 2022.03.18 10:05:00 -03'00'</small></div> <div style="text-align: center; border-top: 1px solid black; margin-top: 5px;">Rochelle Bellemare Manager, Human Resources (902) 490-4807</div>
Financial Reviewed by:	<div style="text-align: right;"><small>Digitally signed by Allan Campbell Date: 2022.03.18 09:58:18 -03'00'</small></div> <div style="display: flex; justify-content: space-between; align-items: center; border-top: 1px solid black; margin-top: 5px;"><div style="text-align: center;">Louis de Montbrun, CPA, CA Director, Corporate Services/CFO (902) 490-3685</div><div style="text-align: right;"><i>On behalf of:</i></div></div>

DEI Framework Goals – 2022/2023

Objective	Q1 (April – June)	Q2 (July – September)	Q3 (Oct – December)	Q4 (January – March)
Increase percentage of employees who agree that the workplace reflects a diverse cultural background to 75% by end of 3-year period	<ul style="list-style-type: none"> Roll out DEI Policy and Fair Hiring Policy Review D&I questions for the annual employee survey and incorporate additional questions as applicable Complete Unconscious Bias Training current employees Expand committee meeting with Union president to include an additional person from each union. 	<ul style="list-style-type: none"> Diversity Moments: increase employee participation to 50% over 3-year period, introduce an incentive for if article is used Identify how we celebrate our selected diversity events/moments (event, written, logo change, email blast) 	<ul style="list-style-type: none"> Develop plan to train outstanding employees and new hires in Unconscious Bias Training, Indigenous Treaty Partner Cultural Training and Psychologically Health and Safety training Train all employees in Respectful Workplace Training and develop plan for new hires 	<ul style="list-style-type: none"> Establish a baseline metric for number of applicants received from an extended reach organization
Increase customers recognition of Halifax Water's Corporate Social Responsibility by 10% by end of 3-year period		<ul style="list-style-type: none"> Verify if customer survey tracks this measurement and add diversity questions to survey Through social media feeds acknowledge our community involvement, donations, and sponsorship activities 	<ul style="list-style-type: none"> Collaborate with HALIFAX on the Anti-Black Racism Policy, strategy, and action plan 	

<p>Work towards gender equality and increase the perception that the workplace reflects gender equality as measured by the employee survey</p>	<ul style="list-style-type: none"> Highlight Halifax Water employees increase in perception that 'My workplace reflects gender equality' from the Employee Survey (from 78% to 80% in 2022) Aspiring Leaders: provide opportunities for supervisory experience and performance matters training 	<ul style="list-style-type: none"> Create a partnership with Construction Association of NS (CANS) and support their partnership with NSCC 	<ul style="list-style-type: none"> In conjunction with Women in Non-Traditional Trades Committee, develop a media campaign to attract and retain women to Halifax Water
<p>Increase accessibility at primary Halifax Water work locations compared to the status quo</p>	<ul style="list-style-type: none"> Verify accessibility aspects are addressed for new Burnside facility 		
<p>Expand employee knowledge and inclusion of the LGBTQ2S+ community</p>	<ul style="list-style-type: none"> Promote Halifax Water's involvement in PRIDE events 		



DEI Framework Goals – 2023/24 & 2024/25

Objective	2023/24	2024/25
Increase percentage of employees who agree that the workplace reflects a diverse cultural background to 75% by end of 3-year period	<ul style="list-style-type: none"> Implement plan to train outstanding employees and new hires in Unconscious Bias Training, Indigenous Treaty Partner Cultural Training and Psychologically Health and Safety training Diversity Moments: increase employee participation to 50% over 3-year period, introduce an incentive for if article is used 	<ul style="list-style-type: none"> Expand suite of diversity training Increase the baseline metric of how many applicants were from one of our extended reach organizations by 5% for by end of 2024/2025 Diversity Moments: increase employee participation to 50% over 3-year period, introduce an incentive for if article is used
Increase customers recognition of Halifax Water's Corporate Social Responsibility by 10% by end of 3-year period.	<ul style="list-style-type: none"> Calculate metric and develop plan for 2024/2025 to keep goal on track, adjust goal if needed after findings 	<ul style="list-style-type: none"> Calculate metric and adjust plan and/or goal as needed
Work towards gender equality and increase the perception that the workplace reflects gender equality as measured by the employee survey	<ul style="list-style-type: none"> Celebrate International Women's Day Employ a 3rd party consultant to conduct an evaluation of pay equity Increase female presence in future Performance Matters (Aspiring Leaders) training 	<ul style="list-style-type: none"> Celebrate International Women's Day Evaluate consultant suggestions and develop a potential implementation plan In accordance with Fair Hiring Policy, apply a diversity lens
Increase accessibility at primary Halifax Water work locations compared to status quo	<ul style="list-style-type: none"> Conduct an evaluation of what accessibility aspects need addressing 	<ul style="list-style-type: none"> Budget to roll out most required enhancements for 2024/2025 and develop plan for future years
Expand employee knowledge and inclusion of the LGBTQ2S+ community	<ul style="list-style-type: none"> Promote GBA+ training (free) 	

TO: Becky Kent, B.A., Chair, and Members of the Halifax Regional Water Commission Board

SUBMITTED BY:  Digitally signed by
Rochelle Bellemare
Date: 2022.03.17
15:10:48 -03'00'

Rochelle Bellemare
Manager, Human Resources

APPROVED:  Digitally signed by Cathie
O'Toole
Date: 2022.03.17
21:51:06 -03'00'

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

DATE: March 15, 2022

SUBJECT: **Group Extended Health Plan Enhancement**

ORIGIN

The Halifax Regional Water Commission Board of Commissioners (the “Board”) approves an enhancement to the Group Extended Health Plan (hereinafter called the “Plan”).

RECOMMENDATION

It is recommended the Board approve the following enhancement to the Plan on the next renewal period, effective June 1, 2022:

- To add a Mental Health benefit which includes an overall combined practitioner maximum of \$1,500 for Psychologists, Social Workers, Psychotherapists and Counseling Therapist.

BACKGROUND/ DISCUSSION

Halifax Water’s Plan consultant, Mercer, recently conducted a benchmarking exercise comparing Halifax Water’s Plan to approximately 500 organizations with similar benefit plans. The goal of this comparison was to ensure that Halifax Water’s benefits were in line with what similar organizations were offering. The last time a complete benchmarking was undertaken was 2013. The market comparison determined that overall, most benefits provided by the Plan are in line or above market norms, except for mental health coverage. Halifax Water currently offers a combined maximum of \$600 for clinical psychologist/register counselling therapists.

Plan members formally requested the Pension and Benefits Advisory Committee (the “Committee”) consider increasing the calendar year maximum from \$600 to \$1,500 and expand the coverage to include Psychologists, Social Workers, Psychotherapists and Counseling Therapist. It was confirmed by Medavie Blue Cross that these benefits are eligible to be added to the Plan, carrying an additional cost of 1.68% or \$22,500 per annum.

At a meeting November 24, 2022, the Committee made a motion to formally endorse the enhancement to the Plan, increasing the mental health benefit align with the market. This enhancement requires the unanimous approval of all three employee groups (CUPE Local 1431, CUPE Local 227, and Non-Union), the approval of which was subsequently received in January 2022.

Halifax Water employee utilization of the Employee Assistance Program has increased over the last two years. Demand for mental health services are increasing as employees and families are dealing with the impact of COVID-19 and increasing economic and societal strains.



It is important that Halifax Water’s benefit offerings remain relevant to changing conditions and continue to keep pace with other comparable employers.

ALTERNATIVES


Maintain the status quo for services.

BUDGET IMPELCATIONS


The impact on the 2022/23 operating budget resulting from this change would be an increase in costs of approximately \$22,500. The impact on future budgets cannot be determined, as the renewal of the Plan is negotiated annually, and subject to decision-making related to funding alternatives.

Report Prepared by:	<div style="text-align: right;"><small>Digitally signed by Rochelle Bellemare Date: 2022.03.17 15:11:04 -03'00'</small></div> <div style="text-align: center;"> Rochelle Bellemare Manager, Human Resources (902) 490-4807</div>
Financial Reviewed by:	<div style="text-align: right;"><small>Digitally signed by Allan Campbell Date: 2022.03.17 16:25:14 -03'00'</small></div> <div style="text-align: center;"> Louis de Montbrun, CPA, CA Director, Corporate Services/CFO (902) 490-3685</div> <div style="text-align: right; margin-top: 10px;"><i>On behalf of:</i></div>

TO: Becky Kent, B.A., Chair and Members of the Halifax Regional Water Commission Board

SUBMITTED BY:  Digitally signed by Heidi Schedler
Date: 2022.03.17 11:15:22 -03'00'

Heidi Schedler, General Counsel and Corporate Secretary

APPROVED: Cathie O'Toole  Digitally signed by Cathie O'Toole
Date: 2022.03.17 09:53:59 -03'00'

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

DATE: March 18, 2022

SUBJECT: Dispute Resolution Officer

ORIGIN

Nova Scotia Utility and Review Board 2016 Stormwater Cost of Service Hearing (M07147) and 2017 Amendments to the Halifax Water Regulations to establish a Dispute Resolution Officer (M07559)

March 22, 2017 Customer Care Centre and Dispute Resolution Process Board Report

BACKGROUND

In 2016 and 2017 the Nova Scotia Utility and Review Board suggested and then approved the establishment of a Dispute Resolution Officer (DRO) for Halifax Water. The DRO is an independent officer tasked with reviewing and adjudicating complaints from Halifax Water customers. The DRO was initially suggested as a means of more efficiently adjudicating complaints from stormwater customers, which in 2017 were numerous. Despite the higher number of complaints related to stormwater, the mandate of the DRO includes all services provided by Halifax Water.

DISCUSSION

In 2017, Halifax Water engaged its first DRO, Kulvinder S. Dhillon, MBA, P.Eng., FEC for a five-year term ending on March 31, 2022. During this time, the DRO adjudicated over 240 complaints on issues involving stormwater, AMI meters, high consumption and billing issues. Halifax Water thanks Mr. Dhillon for his service as our first DRO.

After an executive search facilitated by KBRS, Halifax Water has successfully engaged Murray Doehler, CPA, CA, P.Eng. as its second DRO for a five-year term ending on March 31, 2027. Mr. Doehler is a former member of the Nova Scotia Utility and Review Board and has extensive adjudication experience, particularly in relation to utility services.

Halifax Water works to proactively resolve customer issues before they escalate to the DRO. There are, however, situations where the customer is not satisfied with the end result and wishes to pursue a complaint further. In such situations, the customer is directed to the DRO, who investigates and determines whether Halifax Water operates within the Halifax Water Regulations.

The DRO assists Halifax Water in addressing many customer issues such that they are significantly less likely to get elevated to the Nova Scotia Utility and Review Board. This is a cost savings to Halifax Water and ultimately to the rate base.

BUDGET IMPLICATIONS

The cost of the dispute resolution process is included within the budget for Customer Care, and ultimately is included in the revenue requirements that are the basis for the utility's rates. The change in DRO is not expected to have a significant impact on the 2022/23 operating budget.

Dispute resolution costs are driven by the number of issues requiring investigation. The number of complaints has been trending slightly downward over the last three years; however changes to the stormwater service boundary (if approved by the Nova Scotia Utility and Review Board) are expected to increase the number of investigations starting in the fourth quarter of 2022/23.

Report Prepared by:



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Heidi Schedler, General Counsel, 902-490-6101

Financial Reviewed by:



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Campbell
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09:51:52 -03'00'

On behalf of:

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


TO: Becky Kent, B.A., Chair, and Members of the Halifax Regional Water Commission Board

SUBMITTED BY: **Susheel Arora**
Digitally signed by
Susheel Arora
Date: 2022.03.15
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Susheel Arora, M.A.Sc., P.Eng. Director, Operations

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

APPROVED: 
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O'Toole
Date: 2022.03.15
15:03:23 -03'00'

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

SUBJECT: **Operational Performance Information Report**

INFORMATION REPORT

ORIGIN:

Regular update.

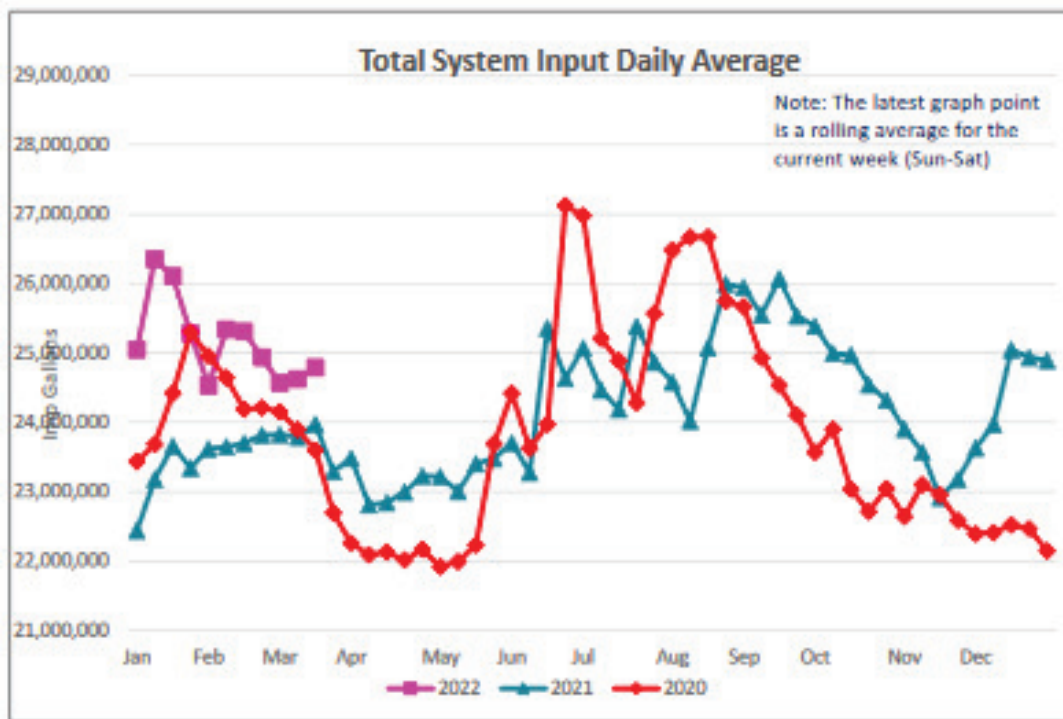
This report provides a high level overview of operational performance for the utility. The safety statistics results are first, followed by indicators and statistics for water and wastewater.

SAFETY STATISTICS – April 1, 2021 to February 28, 2022 (unless stated otherwise)

Organizational Metrics	Results
Number of Lost Time Accidents*	11
Number of motor vehicle accidents per 1,000,000 km driven *	3.36
Number of workplace inspections conducted	217
Percentage of safety talks conducted*	58%
Number of near misses reported	86
Number of employees on accommodation or gradual return to work	55
Number of WCB claims	23
Number of work refusals	0
Number of incidents with written compliance orders	0
Number of employees trained or recertified before due date*	924
Total number of courses taken by employees for training/recertification*	1796

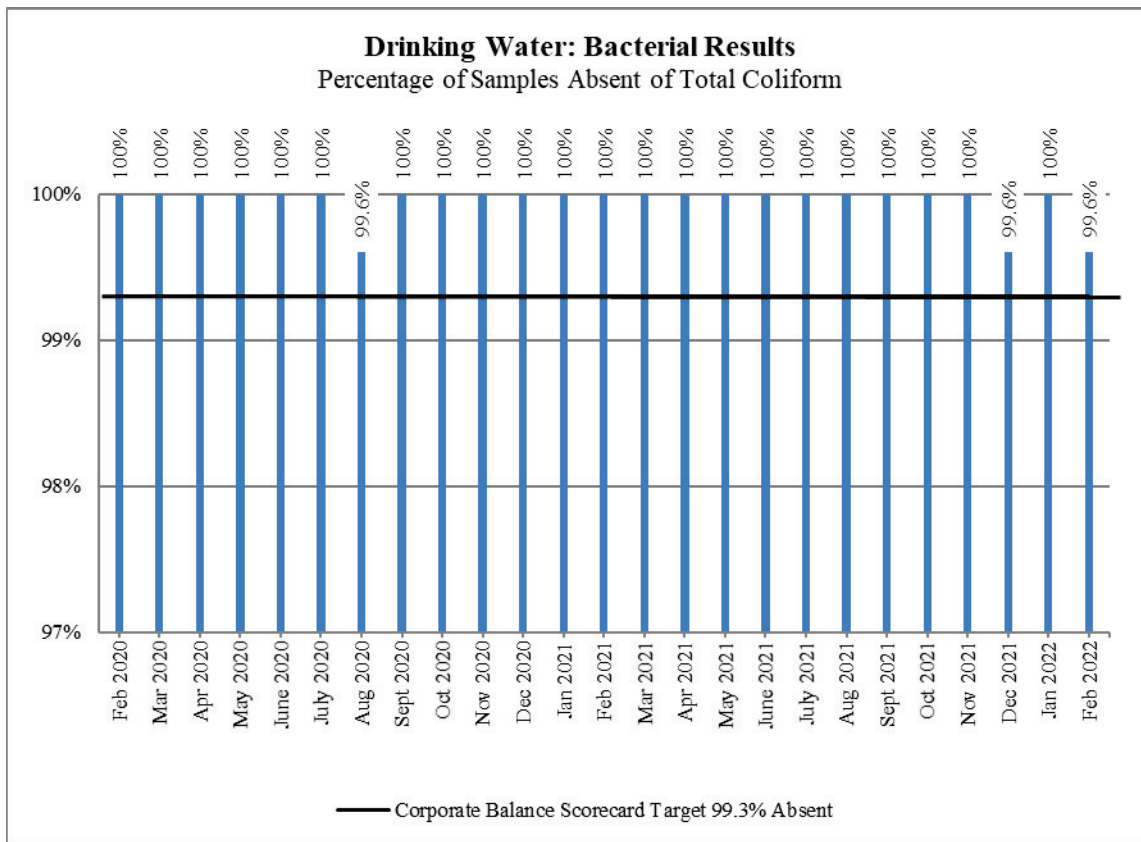
* Update pending end of March 2022

AVERAGE DAILY WATER PRODUCTION



Regional Water Main Break/Leak Data		
Year	Total Breaks/Leaks	Current 12 Month Rolling Total (up to February 2022)
2020/21	179	237
2019/20	191	
2018/19	226	
2017/18	206	
2016/17	216	
Total	1018	
Yr. Avg.	203.6	

Water Accountability
Losses per Service Connection/Day (International Water Association Standard)
Period Ending December 31, 2021
Real Losses: 213 litres
CBS Target: 160



Water Quality Master Plan Objectives				
2021-2022 Q3				
Objective	Total Sites	% Sites Achieving Target	All Sites: 90th Percentile < 15 µg/L	CBSC Awarded Points
Disinfection	64	97%	---	17
Total Trihalomethanes	25	76%	---	0
Haloacetic Acids	21	90%	---	12
Particle Removal	5	96%	---	16
Corrosion Control	101	---	3.4	20
Summary Total				65

Score: 65/100

ITEM # 1-I

Page 5 of 15
Halifax Water Board
March 24, 2022

In this report each facility is assessed using monthly or quarterly averages, depending on the averaging period specified in its Approval to Operate.

Wastewater Treatment Facility	Wastewater Treatment Facility Compliance Summary															
	Rolling Averages - December 2021, January and February 2022															
	CBOD ₅ (mg/L)		TSS (mg/L)		E. coli (counts/ 100mL)		pH		Ammonia (mg/L)		Phosphorous (mg/L)		TRC (mg/L)		Dissolved Oxygen (mg/L)	
	Limit	Avg.	Limit	Avg.	Limit	Avg.	Limit	Avg.	Limit	Avg.	Limit	Avg.	Limit	Avg.	Limit	Avg.
Halifax	50	30	40	20	5000	0	6-9	6.7	-	-	-	-	-	-	Not acutely lethal	Continued
Dartmouth	50	39	40	35	5000	0	6-9	6.8	-	-	-	-	-	-	Not acutely lethal	Continued
Herring Cove	50	24	40	16	5000	0	6-9	6.7	-	-	-	-	-	-	Not acutely lethal	Continued
Eastern Passage	25	11	25	12	200	0	6-9	6.9	-	-	-	-	-	-	Not acutely lethal	Continued
Mill Cove	25	14	25	17	200	19	6-9	6.7	-	-	-	-	-	-	Not acutely lethal	Continued
Springfield	20	6	20	4	200	14	6-9	6.8	-	-	-	-	-	-	-	Continued
Frame	20	7	20	1	200	10	6-9	6.9	-	-	-	-	-	-	-	Continued
Middle Musq.	20	6	20	4	200	10	6-9	7.3	-	-	-	-	-	-	-	Continued
Uplands	20	9	20	7	200	27	6-9	7.0	-	-	-	-	-	-	-	Continued
Aerotech	5	2	5	1	200	10	6-9	7.2	5.7 W 1.2 S	0.1	0.13	0.07	-	6.5	10.5	Not acutely lethal
North Preston	10	7	10	9	200	10	6-9	6.6	3	1.0	1.5	0.6	-	-	-	Continued
Lockview	20	8	20	13	200	13	6.5-9	6.2	8.0 S	7.5	1.2 S	0.4	-	-	-	Continued
Steeves (Wellington)	20	8	20	1	200	10	6.5-9	7.2	14.4 S	0.1	1.0 S	0.1	-	-	-	Continued
BLT	15	8	20	20	200	21	6-9	6.9	5 W 3 S	2	3 W 1 S	1	0.02 *	0.10	-	Not acutely lethal
Avg. of all Facilities	13		11		10		6.9		2.1		0.4		0.10		10.5	

NOTES & ACRONYMS:

CBOD₅ - Carbonaceous 5-Day Biochemical Oxygen Demand

TSS - Total Suspended Solids

* TRC - Total Residual Chlorine - Maxxam can only measure 0.10 mg/L residual; results of 0.1 mg/L are compliant

BDL - Below Detection Limit

W / S - Winter / Summer compliance limits

NSECC requires monthly averages be less than the NSECC Compliance Limit for each parameter at Dartmouth, Eastern Passage, Halifax, Herring Cove, Mill Cove

NSECC requires quarterly averages be less than the NSECC Compliance Limit for each parameter at Aerotech, Lockview, Mid. Musq., Frame, BLT, Uplands, Springfield Lake

NSECC requires annual averages be less than the NSECC Compliance Limit for each parameter at North Preston and Steeves

Continued - All parameters remain essentially unchanged since the last report

Improved - One or more parameter(s) became compliant since the last report

Declined - One or more parameters(s) became non-compliant since the last report

LEGEND

	NSECC Compliant
	NSECC Non-Compliant

SEASONAL RULES:

BLT NH3: shall not exceed 3 mg/L between May 1 and October 30; otherwise, shall not exceed 5 mg/L

BLT TP: shall not exceed 1 mg/L between May 1 and October 30; otherwise, shall not exceed 3 mg/L

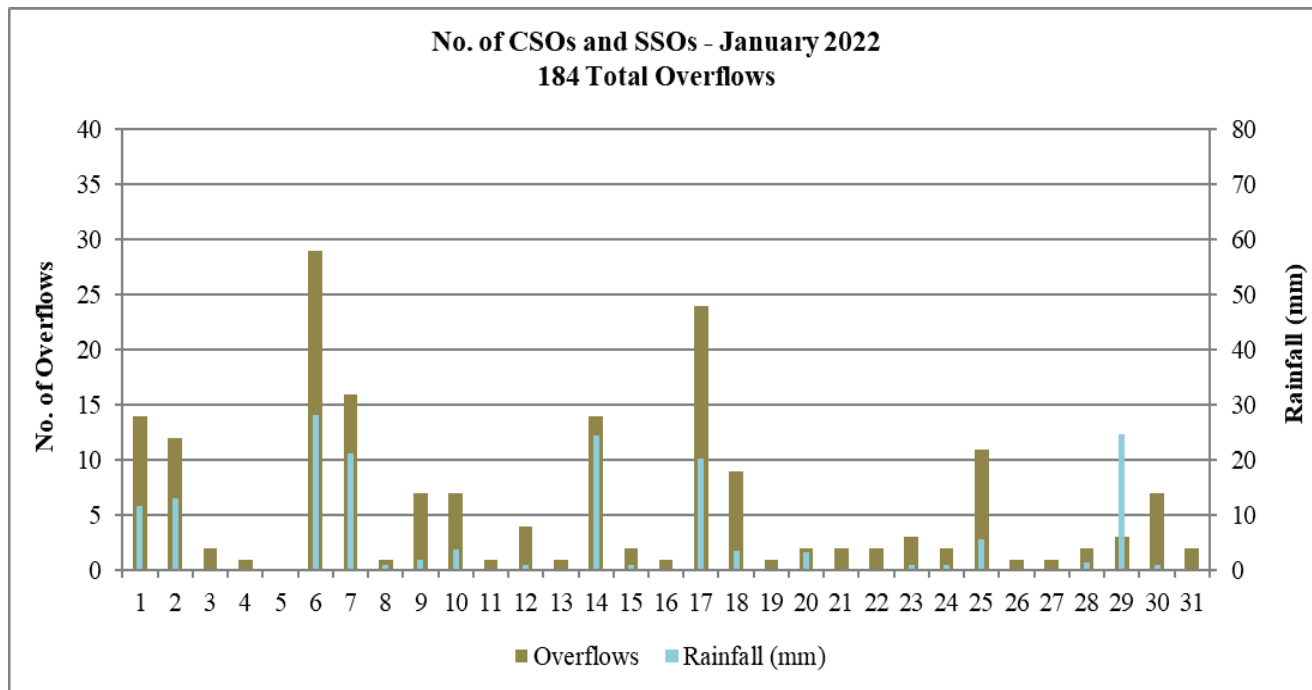
Aerotech NH3: shall not exceed 1.2 mg/L between May 1 and October 30; otherwise, shall not exceed 5.7 mg/L

Lockview NH3: shall not exceed 8 mg/L between May 1 and October 30

Lockview TP: shall not exceed 1.2 mg/L between May 1 and October 30

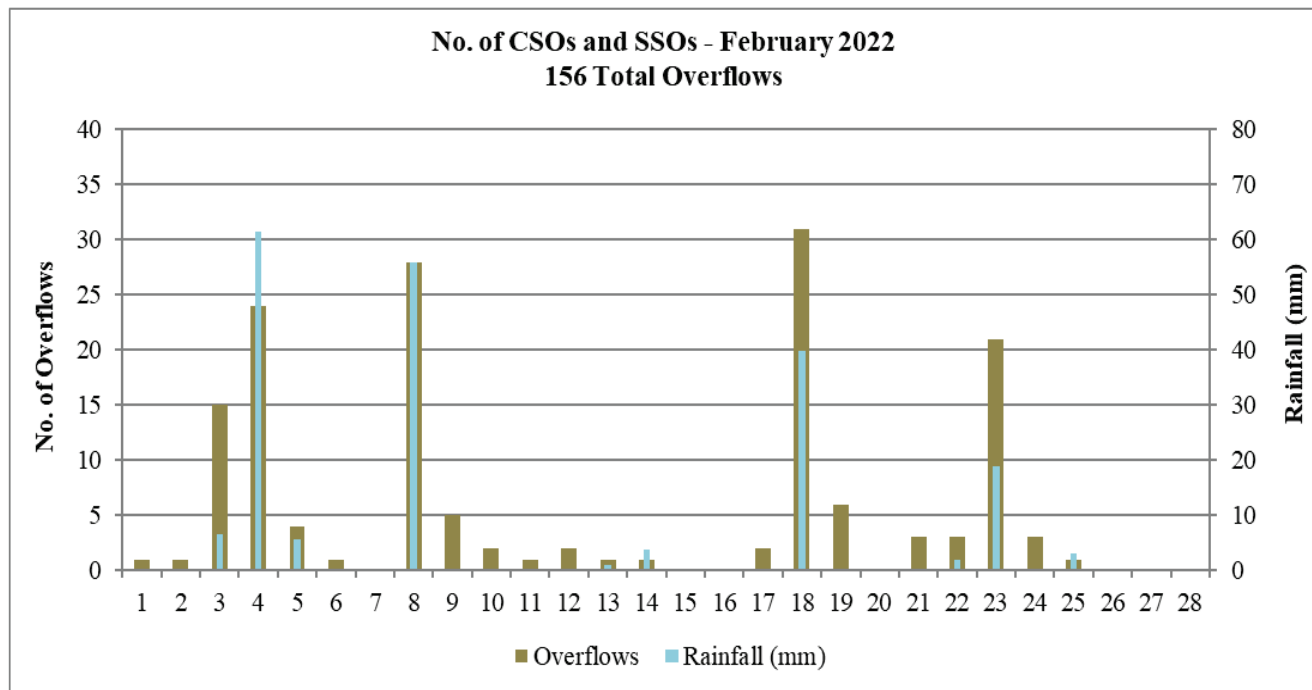
Wellington NH3: shall not exceed 14.4 mg/L between May 1 and October 30

Wellington TP: shall not exceed 1.0 mg/L between May 1 and October 30



NOTES & ACRONYMS: CSO - Combined Sewer Overflow SSO - Sanitary Sewer Overflow

- Rainfall data is from Halifax Water's rain gauge at the Halifax WWTF.
- There were fourteen overflows on days when there was no recorded rainfall, as follows:
 1. January 3: The CSO at Maitland St PS & CSO was due to a tidal surge. The CSO at Duffus St PS was due to a pump restriction from the Halifax WWTF.
 2. January 4: The CSO at Maitland St PS & CSO was due to a tidal surge.
 3. January 11: The CSO at Chain Rock PS & CSO was due to a blockage caused by debris.
 4. January 16: The CSO at Duffus St PS was due to a pump restriction from the Halifax WWTF.
 5. January 19: The CSO at Duffus St PS was due to a pump restriction from the Halifax WWTF.
 6. January 21, 22, 26, 27 and 31: The CSOs at Upper Water St CSO were due to blockages caused by debris.



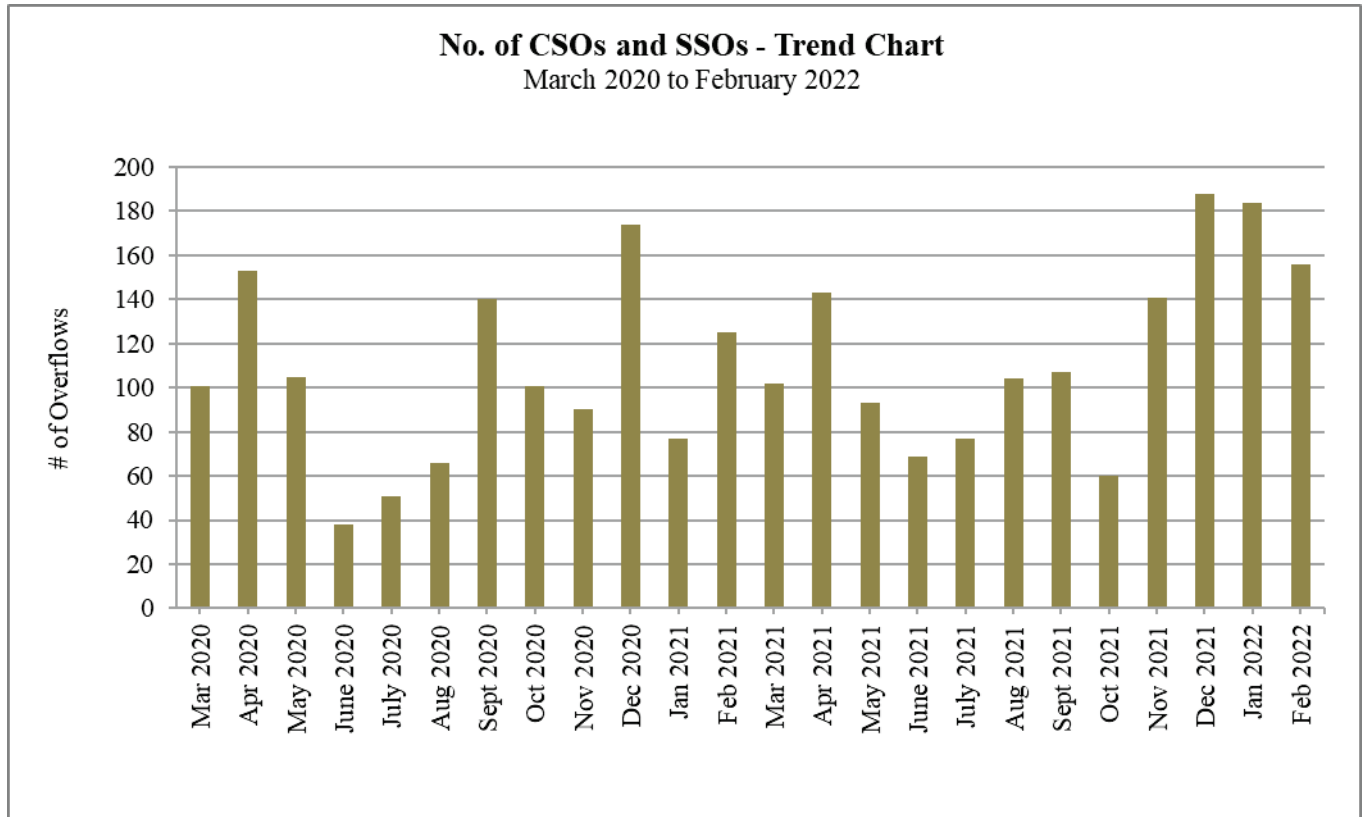
NOTES & ACRONYMS: CSO - Combined Sewer Overflow SSO - Sanitary Sewer Overflow

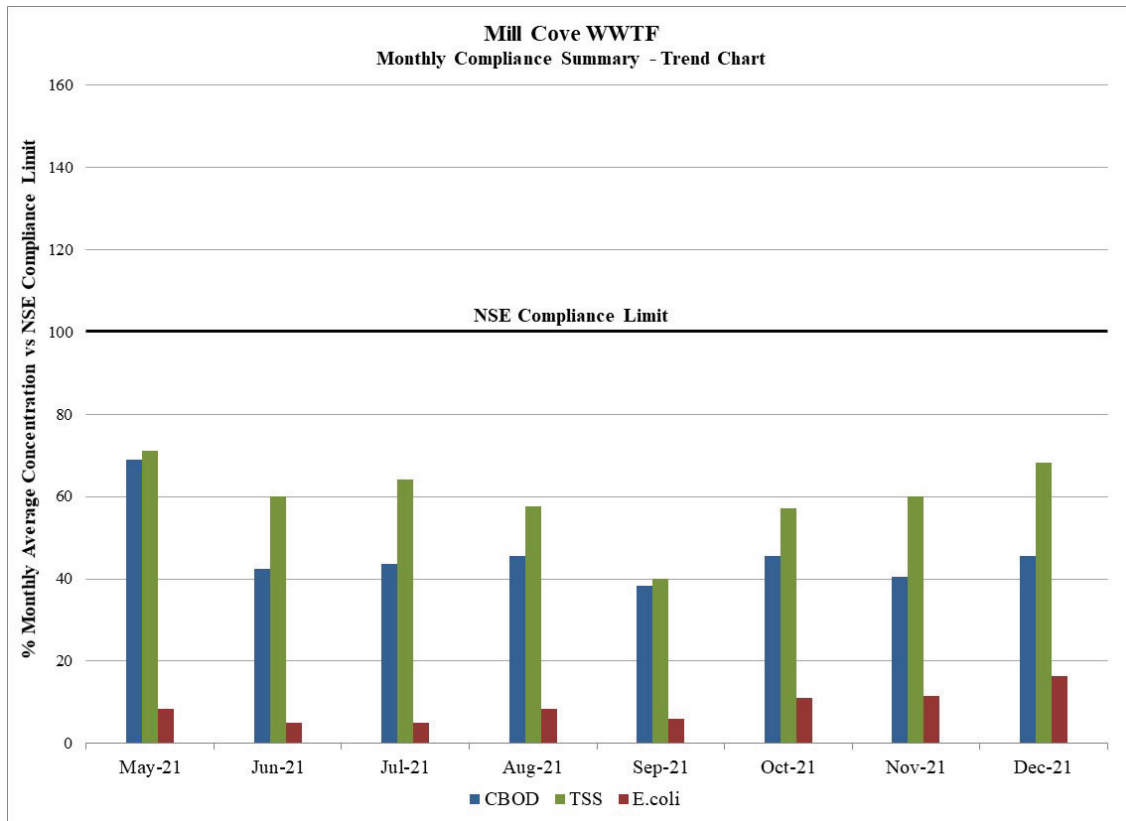
Rainfall data is from Halifax Water's rain gauge at the Halifax WWTF.

There were twenty-six overflows on days when there was no recorded rainfall, as follows:

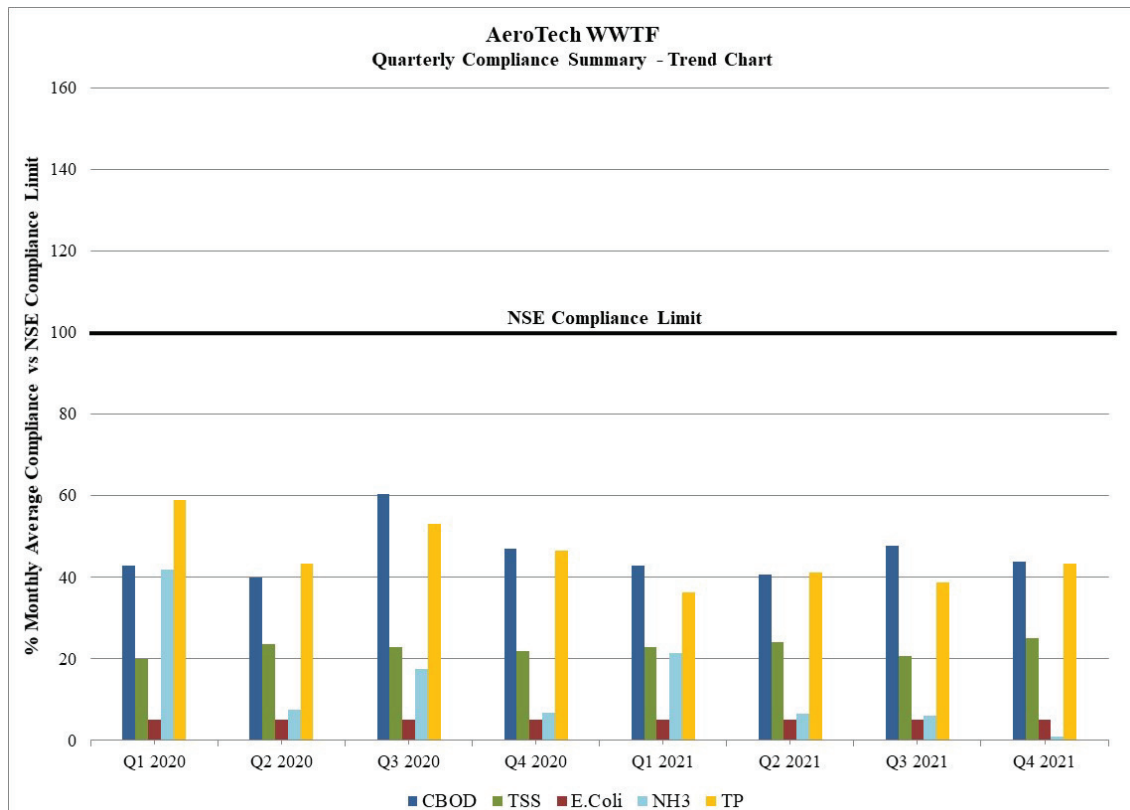
1. February 1 and 2: The CSOs at Upper Water St CSO were due to blockages caused by debris.
2. February 6: The CSO at Duffus St PS was due to a pump restriction from the Halifax WWTF.
3. February 9: The CSOs at Chain Rock PS & CSO and Upper Water St CSO were due to blockages caused by debris. The CSO's at Maitland St PS & CSO, Old Ferry Rd PS & CSO and Jamieson St PS & CSO were due to rain on the previous day.
4. February 10: The CSOs at Chain Rock PS & CSO and Upper Water St CSO were due to blockages caused by debris.
5. February 11: The CSO at Chain Rock PS & CSO was due to a blockage caused by debris.
6. February 12: The CSO at Chain Rock PS & CSO was due to a blockage caused by debris. The SSO at Mill Cove Surge Tank was due to rain on a previous day.
7. February 17: The CSO at Duffus St PS was due to a pump restriction from the Halifax WWTF.
8. February 19: The CSO at Chain Rock PS & CSO was due to a blockage caused by debris. The CSOs at Old Ferry Rd PS & CSO and Jamieson St PS & CSO were due to rain on the previous day.
9. February 21: The CSO at Chain Rock PS & CSO was due to a blockage caused by debris. The CSO at Duffus St PS was due to a pump restriction from the Halifax WWTF. The SSO at Mill Cove Surge Tank was due to rain on the previous day.
10. February 24: The CSO at Chain Rock PS & CSO was due to a blockage caused by debris. The SSOs at

Mill Cove Surge Tank were due to rain on the previous day.

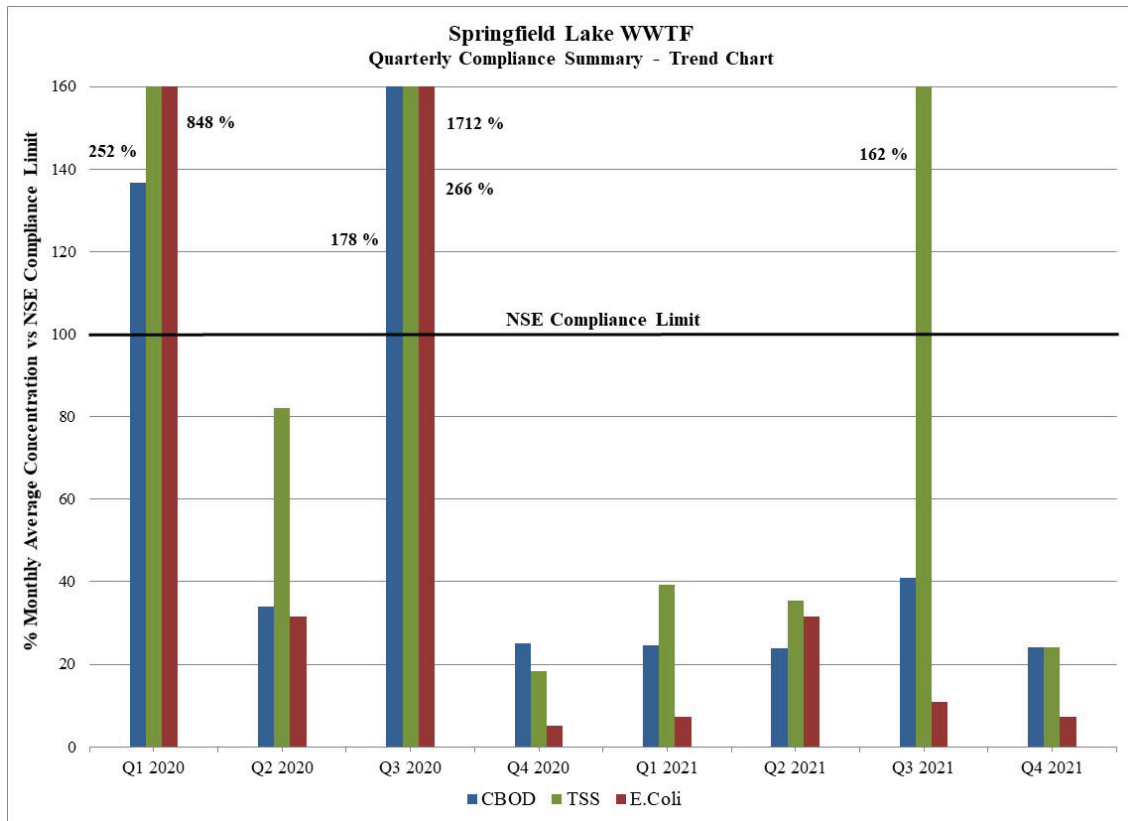




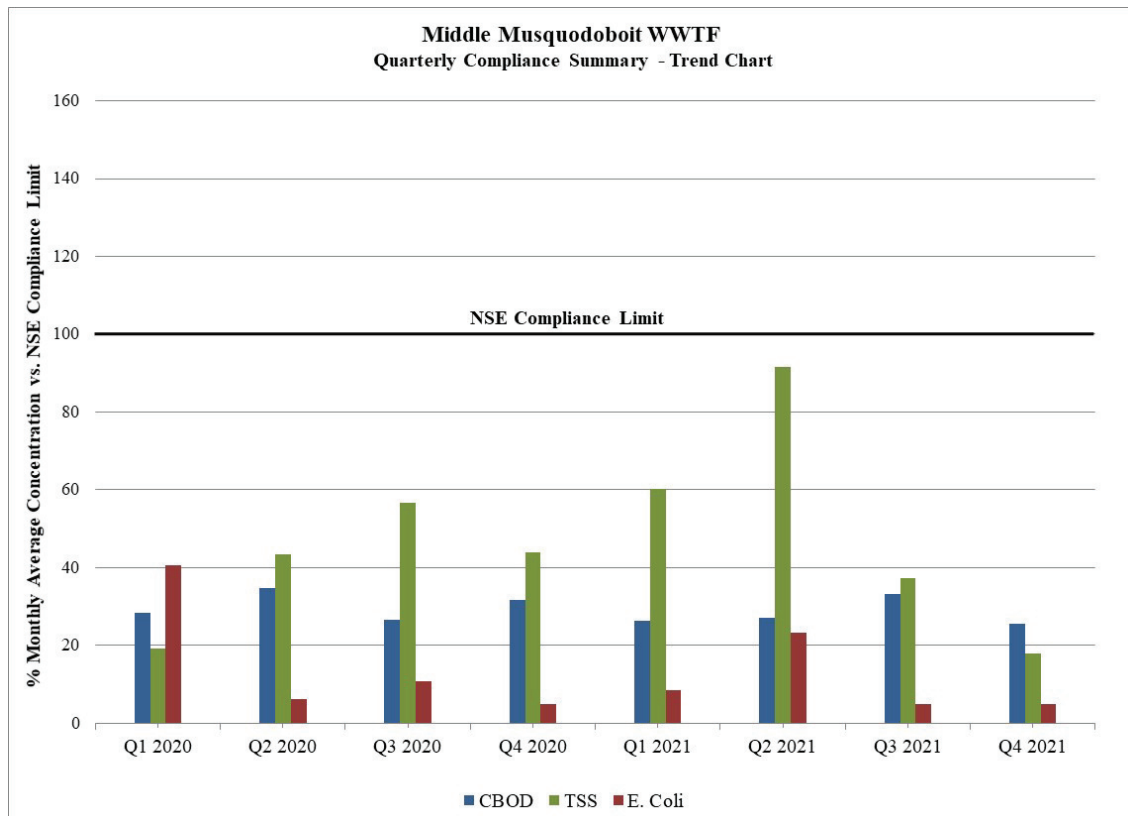
Lower numbers represent better performance.



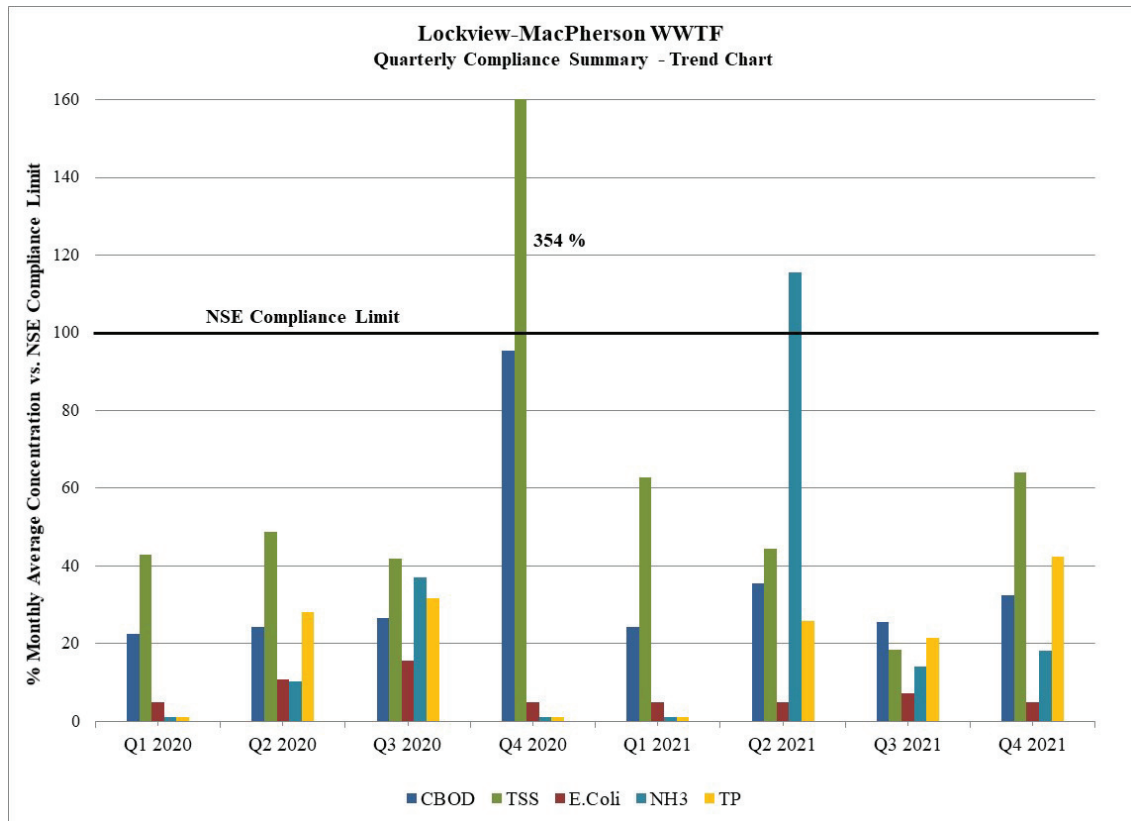
Lower numbers represent better performance.



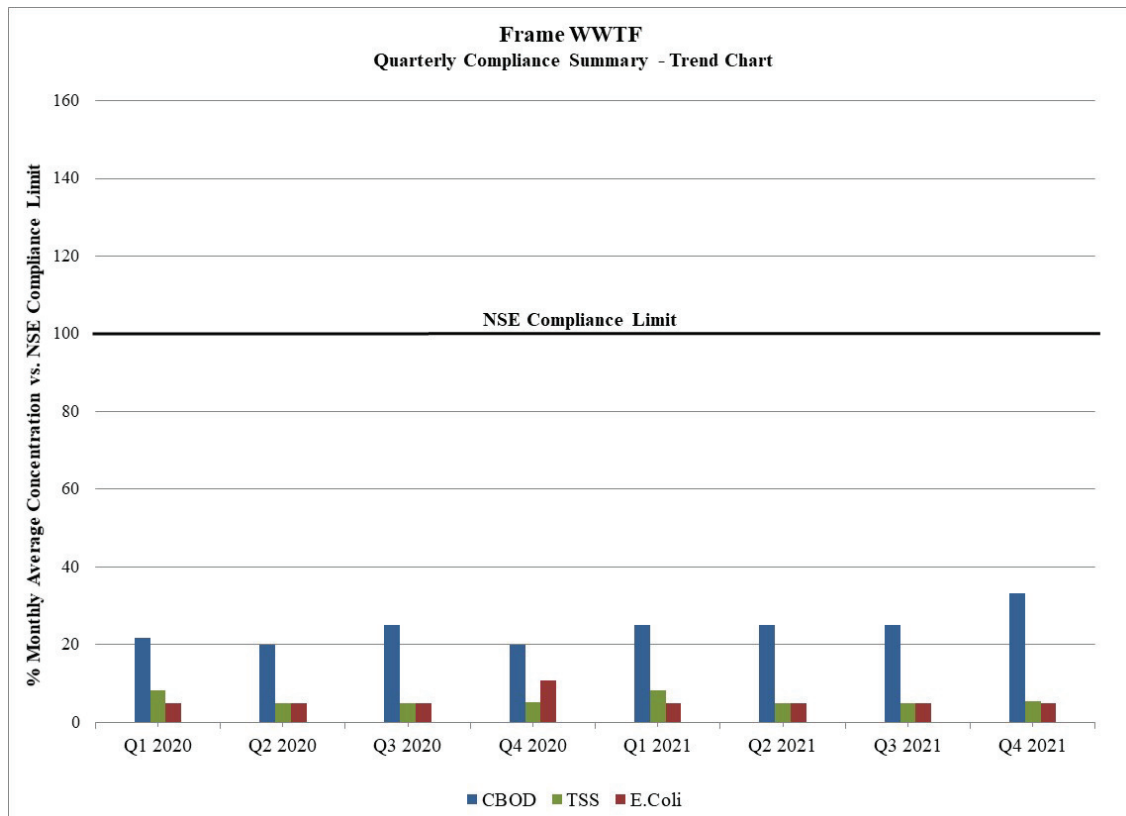
Lower numbers represent better performance.



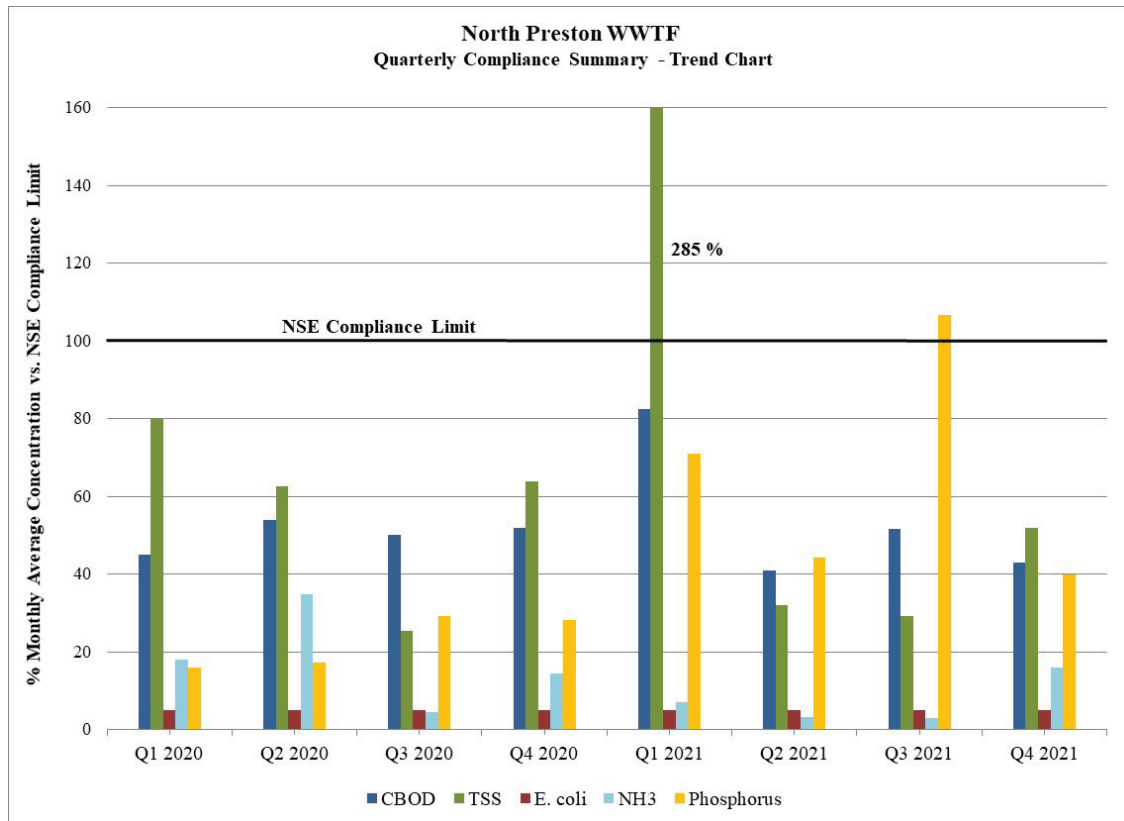
Lower numbers represent better performance.



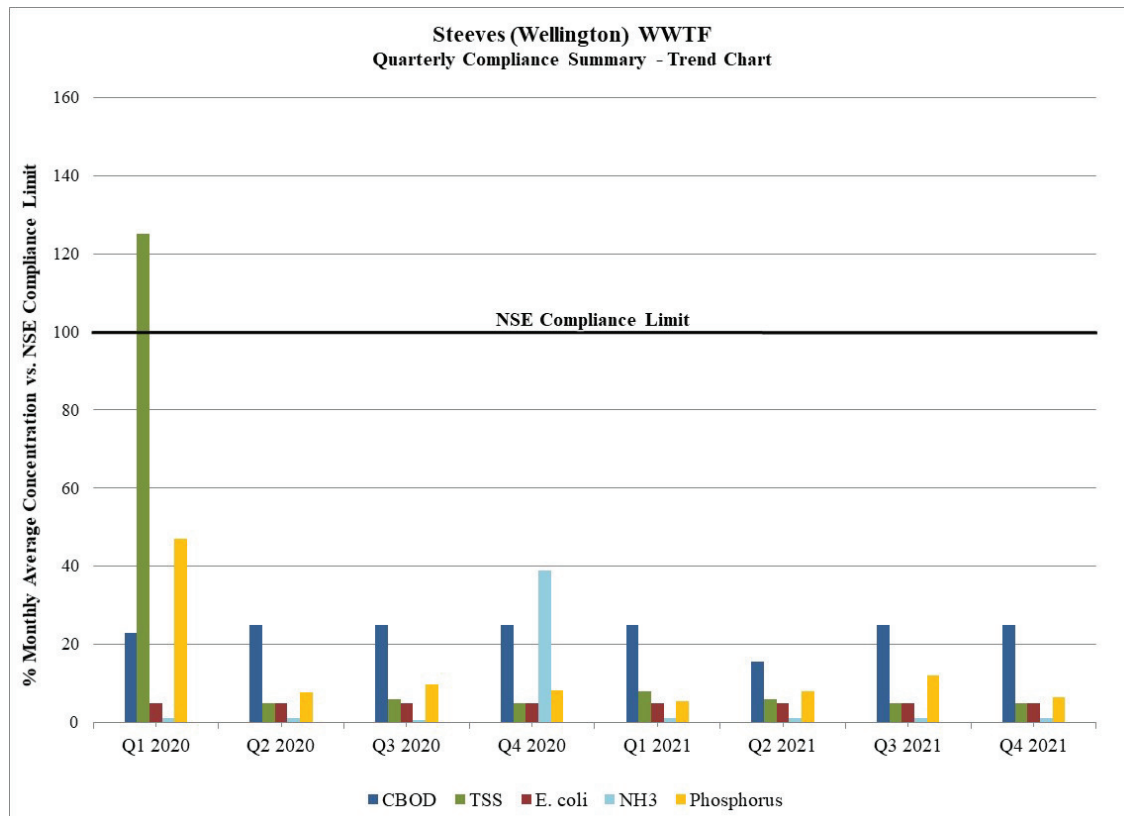
Lower numbers represent better performance.



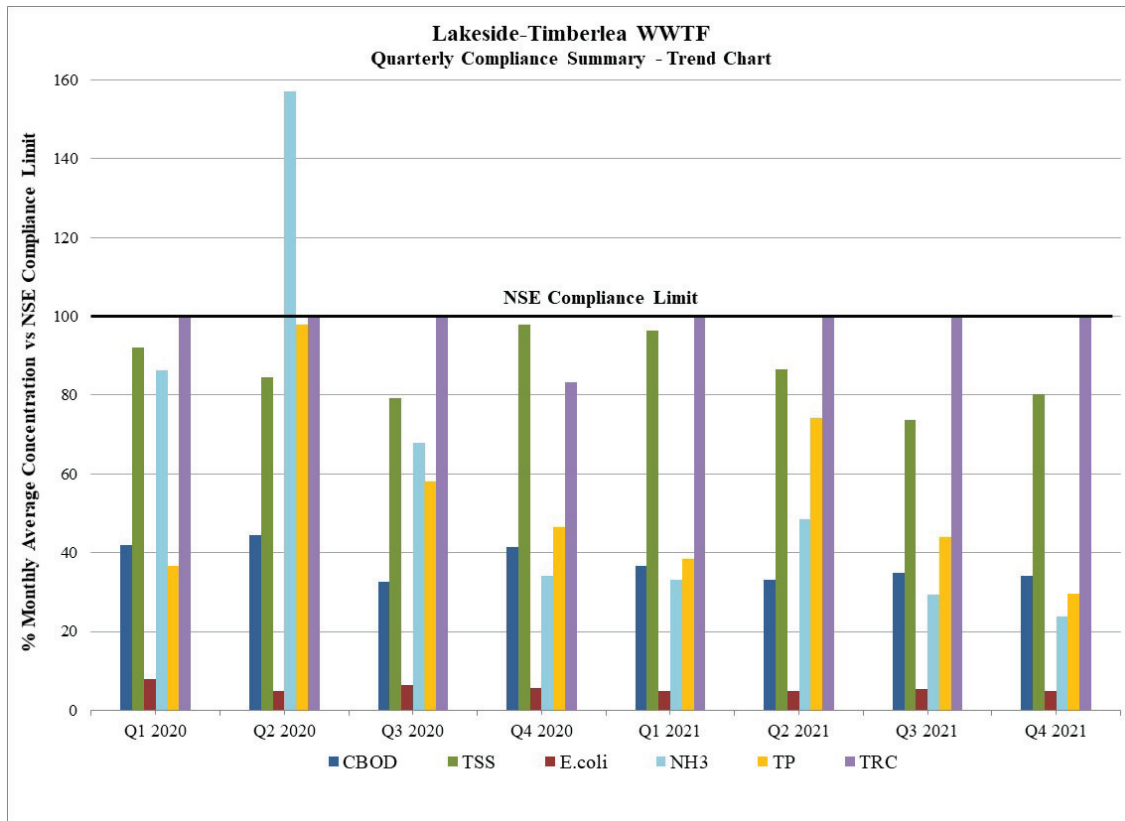
Lower numbers represent better performance.



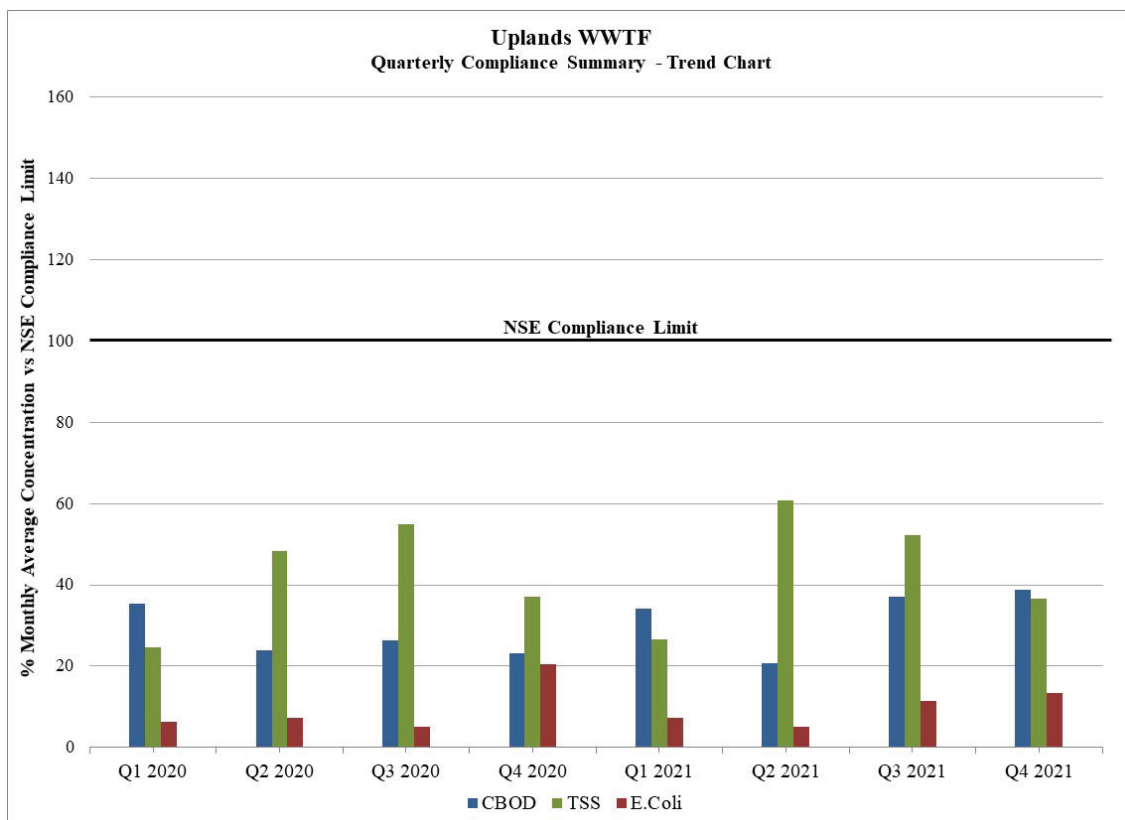
Lower numbers represent better performance.



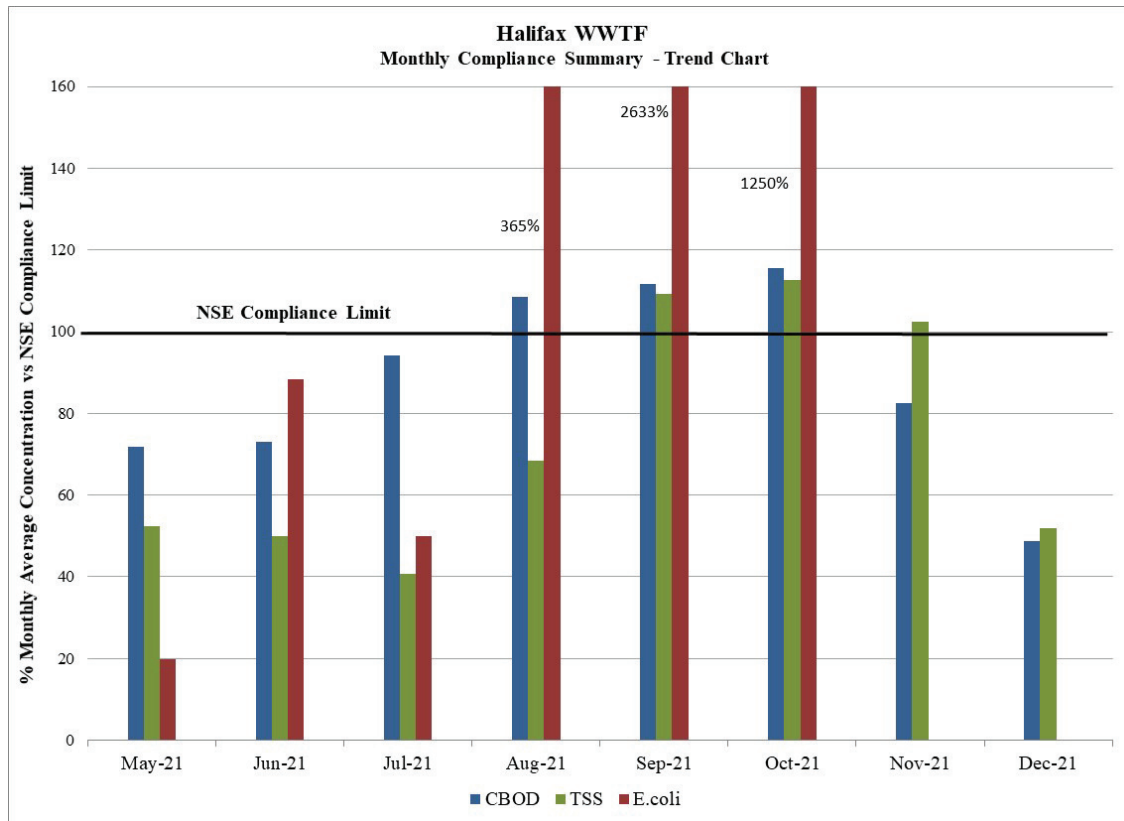
Lower numbers represent better performance.



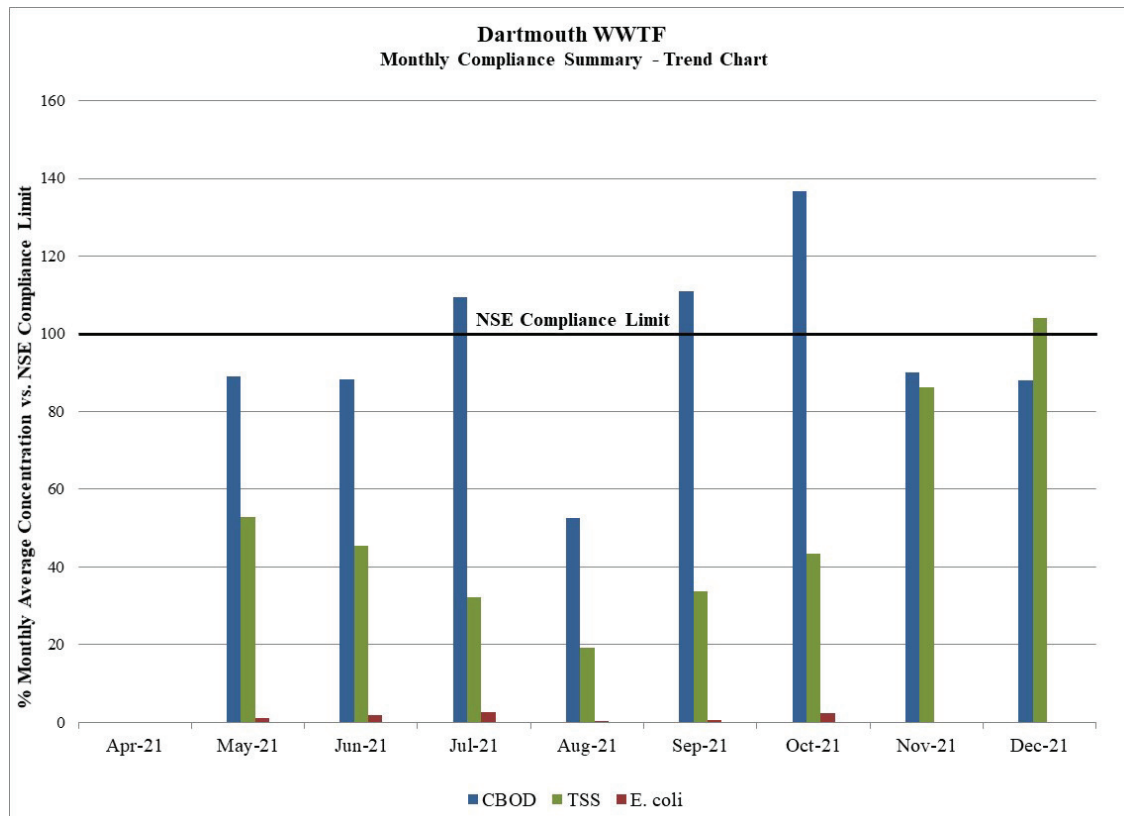
Lower numbers represent better performance.



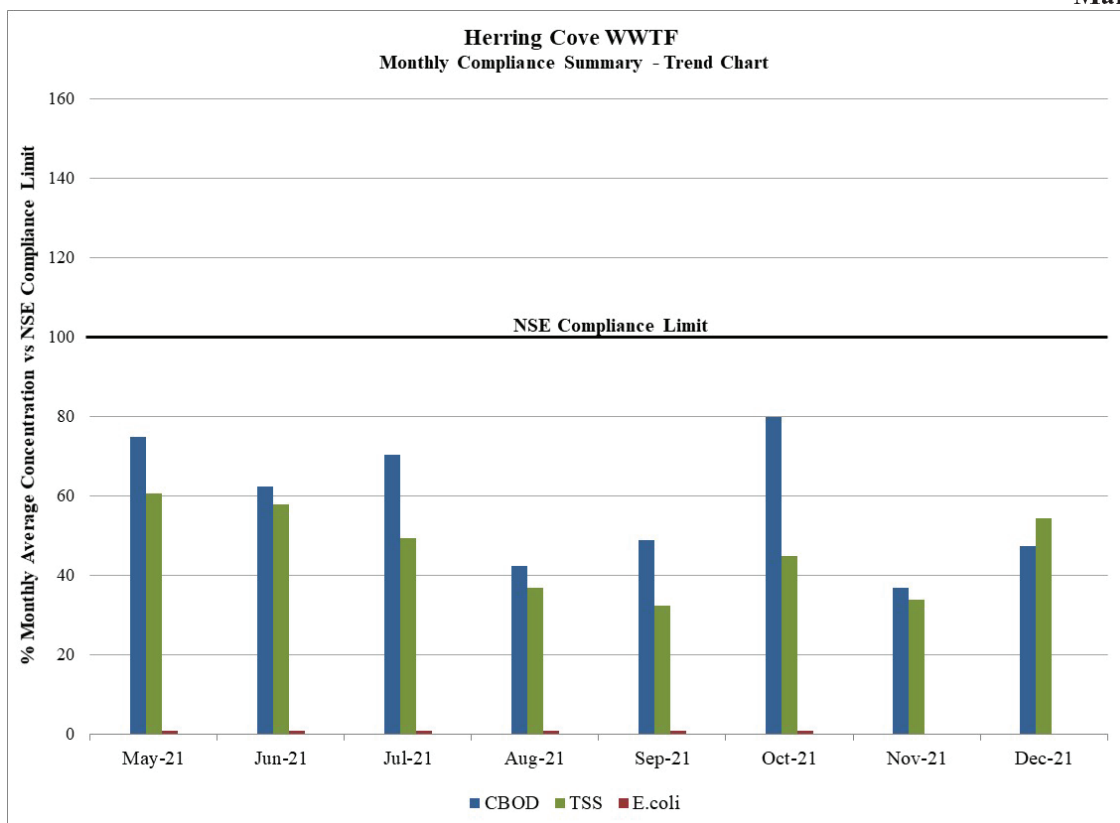
Lower numbers represent better performance.



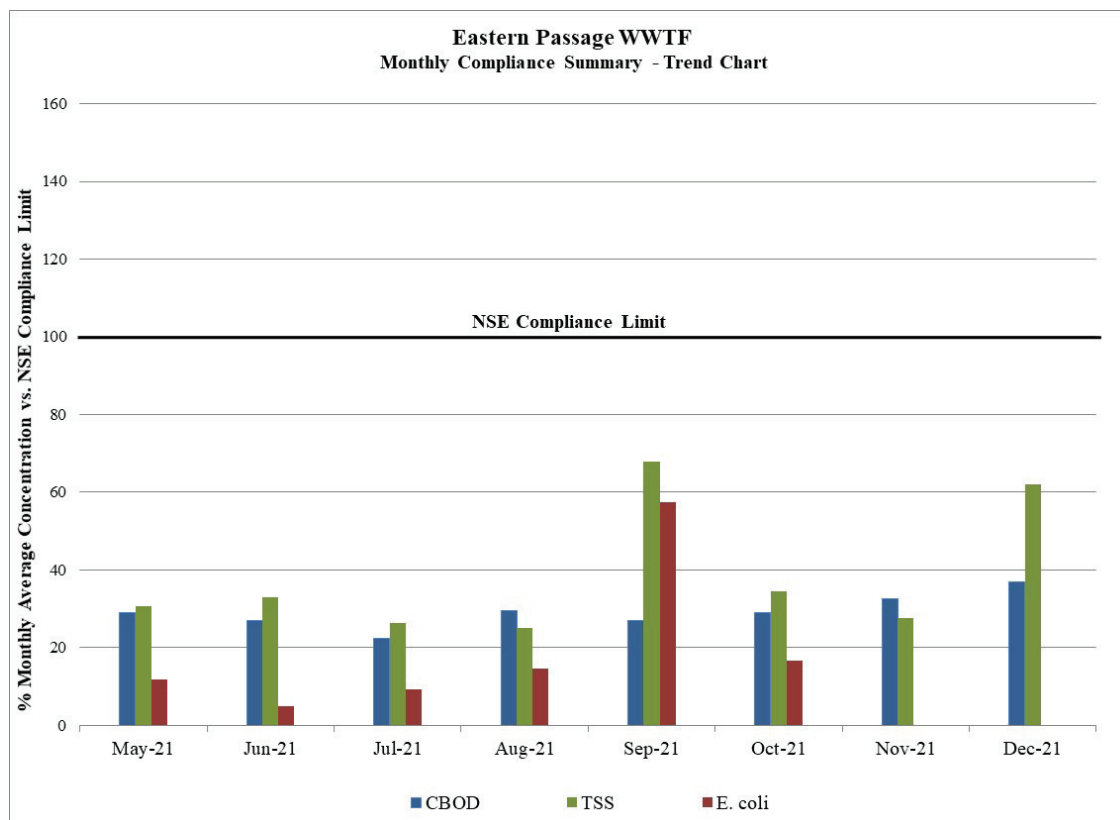
Lower numbers represent better performance.



Lower numbers represent better performance.



Lower numbers represent better performance.



Lower numbers represent better performance.


ITEM # 1-I


Page 16 of 15

Halifax Water Board

March 24, 2022

TO: Becky Kent, B.A., Chair, and Members of the Halifax Regional Water Commission Board as Trustees of the Halifax Regional Water Commission Employees' Pension Plan

SUBMITTED BY:  Digitally signed by Allan Campbell
Date: 2022.03.15 15:10:35 -03'00' *On behalf of:*
Louis de Montbrun, CPA, CA,
Director, Corporate Services / CFO

APPROVED:  Digitally signed by Cathie O'Toole
Date: 2022.03.15 15:41:10 -03'00'
Cathie O'Toole, MBA, FCPA, FCGA, ICD.D
General Manager

DATE: March 9, 2022

SUBJECT: **Halifax Regional Water Commission Employees' Pension Plan
Financial Report Fourth Quarter, 2021**

INFORMATION REPORT

ORIGIN

Financial reporting for the Halifax Regional Water Commission Employees' Pension Plan (hereinafter called the "Plan").

BACKGROUND

The Board is required to review the periodic (quarterly) financial results of the Plan throughout the year.

DISCUSSION

The attached statement of changes in net assets available for benefits (Appendix A) outlines the annual budget for the Plan and actual financial performance for the Fourth Quarter (January 1 to December 31, 2021). Favourable or unfavourable variances reported compare actual results to annual budget amounts, for the twelve (12) month period ending December 31st, 2021. Year-end audited results for 2019 and 2020 are shown for comparative purposes.

As shown on the statement of changes in net assets available for benefits, net assets available for benefits have increased by \$19.6 million for the twelve (12) month period ending December 31, 2021. The budget for the period forecasted an increase in net assets available of \$9.8 million. Actual results for the period of \$19.6 million compared to the annual budget of \$9.8 million results in a favourable variance of \$9.8 million.

The annual budget forecasted revenue of \$8.6 million. Revenue for the period totaled \$18.7 million, which when compared to the budget of \$8.6 million results in a favourable variance of \$10.1 million. Performance of the HRM Master Trust directly drives the revenue figures reported and change tends to be more volatile compared to contributions and expenses of the Plan. This variance is attributed directly to the actual increase in the fair value of the investment assets being higher than expected. The increase for the period totaled \$15.4 million compared to the budget of \$5.1 million, a difference of \$10.3 million or 201%. Investment income for the period was comparable to budget, reporting only a modest decrease.

Contributions of \$6.6 million are slightly under the annual budget of \$6.7 million. This results in an unfavourable variance of 2% and is mostly due to the timing of projected new hires.

Expenses of \$5.7 million for the period are higher than the budget of \$5.5 million resulting in an unfavourable variance of \$0.2 million or 4%. The main contributor to this variance is termination payments which are higher than the annual budget estimate by \$0.3 million. Benefit payments are lower than the annual budget by \$0.1 million due to fewer retirements than expected.

SERVICE STANDARDS

Tracking of Regulatory Filing Requirements, Administrative Reporting Requirements and Service Standards for actuarial calculation requests is ongoing. The reports for Regulatory Filing Requirements and Administrative Reporting Requirements are attached as Appendix B and Appendix C respectively, and document administrative compliance within the various levels of reporting for the period.

Service Standard results for the Fourth Quarter (October 1st to December 31st, 2021) have been attached as Appendix D. The primary purpose of the service standard report is to report on the administrative compliance with the Pension Benefits Act of Nova Scotia (the “Act”) respecting the timing of statements or notifications required under the Act, such as:

- Retirement statement to member;
- Notification of options to retiring member;
- Death benefits statement; and
- Statement on termination

A secondary purpose of the report is to provide performance reporting respecting the Plan's actuaries, for required deliverables based on pre-determined standards. These standards are internal in nature, and mutually agreed upon by the actuary and Halifax Water.

Fourth Quarter results reported in Appendix D show, out of 2 requests submitted for retirement estimates (with options), the retirement package was provided to the member within the prescribed timelines under the Act, 60 days prior to the Member's intended retirement date. There were 3 terminations during the period, with each terminated employee provided a termination package (with options) within the prescribed timelines under the Act, within 60 days after their termination date.

Performance of the actuary, also reported in Appendix D, shows out of 5 requests in total, the actuary met the pre-determined standard in 4 instances, with average response times for retirement and termination calculation estimates of 10 days and 9 days respectively. The response time of the actuaries is continuously monitored to ensure required service standards are maintained.

ATTACHMENTS

APPENDIX A – Financial Report:

Statement of changes in net assets available for benefits, for the twelve (12) month period ended December 31, 2021

APPENDIX B – Regulatory Filing Requirements – Q4 2021

APPENDIX C – Administrative Reporting Requirements – Q4 2021

APPENDIX D – Service Standards Report – Q4 2021

Report Prepared by:	<div style="display: flex; align-items: center;"><div style="margin-right: 10px;">Heather Britten</div><div style="border-left: 1px solid black; padding-left: 10px; text-align: center;"><small>Digitally signed by Heather Britten Date: 2022.03.15 14:37:33 -03'00'</small></div></div> <div style="border-top: 1px solid black; margin-top: 5px; text-align: center;">Heather Britten, Quality Assurance Officer 902-490-1895</div>
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Halifax Regional Water Commission Employees' Pension Plan
Statement of changes in net assets available for benefits
For the twelve (12) month period ended December 31, 2021
Benchmark 100%

		December 31, 2021					
			Variance		Actual	Actual	
			Actual versus Budget		(Audited)	(Audited)	
			Favourable (Unfavourable)		2020	2019	
	2021						
	Budget	Actual	\$	%			
Revenue							
Net investment income:							

Expenses on this statement are reported on a cash basis. Comparative years are reported on an accrual basis as that is how they are reported on the financial statements.

Halifax Regional Water Commission Employees' Pension Plan
Regulatory Filing Requirements - 2021
as at December 31, 2021

Report	Regulatory Body	Filing Deadline	Date last filed	Comments
1 Annual Form 3 - Summary of Contributions	Superintendent of Pensions	60 days after the beginning of each fiscal year	February 25, 2022	Filed directly with the Trustee, Northern Trust, for the DB Plan.
			February 25, 2022	Filed directly with the Trustee, Industrial Alliance, for the DC Plan.
2 Pension Plan Income Tax Return (T3)	Canada Revenue Agency	March 31st	March 3, 2022	CRA requires Northern Trust as the custodian to prepare and file T3 Income Tax Returns each year. Information obtained from HRM Pension Plan quarterly report.
3 Pension Plan Audited Financial Statements	Superintendent of Pensions	6 months after the Plan's fiscal year end	June 30, 2021	Audited financial statements were completed and approved by the HW Board on June 17th, 2021 and subsequently forwarded to the regulatory body.
			June 15, 2021	Audited financial statements are not prepared for this pension plan. However, Industrial Alliance provides a Financial Report detailing all pertinent details of the plan. This report is submitted to the regulatory body prior to June 30th each year.
4 Annual Information Returns (AIR)	Superintendent of Pensions	June 30th	June 30, 2021	DB Plan
			June 15, 2021	DC Plan
5 Actuarial Valuation*	Superintendent of Pensions Canada Revenue Agency	September 30th	September 27, 2019 September 27, 2019	Actuarial Valuation was conducted as of January 1, 2019. January 1, 2022 is the date of the next Actuarial Valuation.
6 Plan Amendments	Superintendent of Pensions Canada Revenue Agency	60 days after the amendment approved by the Board		DB Plan
			n/a	DC Plan
		60 days after the amendment approved by the Board		All documents relating to the registration of the DC Plan were received by the Superintendent October 6, 2017.

* Actuarial Valuations are required at a minimum every three (3) years.

** Notional Agreements were implemented during 2017 with an effective date for January 1, 2017. Notional Agreements are not registered therefore not subject to reporting requirements to a regulatory body.

**Halifax Regional Water Commission Employees' Pension Plan
Administrative Reporting Requirements - 2021
as at December 31, 2021**


Report	Filing Deadline/ Recurrence	Date last filed/ Performed	Comments
1 Pensioners' Payroll	Monthly	March 1, 2022	Pensioners are paid the 1st of each month; no exceptions to report for the Fourth Quarter 2021.
2 Contributions to the Trustee	Monthly	March 8, 2022	Remittances due to Northern Trust within 30 days of month end; no exceptions to report for Fourth Quarter 2021.
		January 5, 2022	Remittances due to Industrial Alliance within 30 days of month end; no exceptions to report for Fourth Quarter 2021.
		n/a	Notional Agreement* There are no contributions made to this plan.
3 Pension Plan Financial Statements	Quarterly	March 24, 2022	Fourth Quarter (January - December 2021)
		March 24, 2022	A periodic financial report is now prepared for the Defined Contribution (DC) Plan with the most recent being for the period January 1 - December 31, 2021. A financial report is prepared by Industrial Alliance and that report is filed with the Annual Information Return (AIR) to the regulator annually.
		n/a	Notional Agreement* Financial statements not required.
4 Investment Performance Review & Compliance with SIP&P	Quarterly	January 27, 2022	Third Quarter (January - September 2021) Report prepared quarterly by administration staff for the HW Board of Directors, in conjunction with the quarterly HRM Pension Plan Committee meeting documentation. Statement of Investment Policies & Procedures (SIP&P) is reviewed annually and was last reviewed and approved on December 9, 2021.
5 Annual Pension Statements to Members	June 30th	June 23, 2021	Statements issued annually by June 30th.
		June 23, 2021	Statements issued annually in conjunction with the Defined Benefit (DB) Plan statements. Members also have access to online, real-time reporting.
		June 23, 2021	Statements issued annually in conjunction with the DB Plan statements.
6 Fiduciary Liability Insurance	Annually	October 22, 2021	Reviewed and renewed annually by administration staff. The policy period expires November 30 each year.

* Notional Agreements were implemented during 2017 with an effective date for January 1, 2017. Notional Agreements are not registered therefore not subject to reporting requirements to a regulatory body.


Halifax Regional Water Commission Employees' Pension Plan
Service Standards Report - 2021

Quarter 4 (as at December 31, 2021)										
Transaction	Actuary						HW Staff		Total Average Service Days	Compliance with PBA
	Standard	Total # Completed	# Past Standard	% within Standard	Average Service Days	Total # Completed	Average Service Days			
Retirement Estimates	11 Business Days	2	1	50%	10	2	9	19	Yes	
Marriage Breakdown Calculations	15 Business Days									
Post-Retirement Death Letter	15 Business Days									
Pre-Retirement Death Benefit	15 Business Days									
Termination Estimate Calculations										
- Standard	11 Business Days	3	0	100%	9	3	17	26	Yes	
- Non Standard (Incl RTAs)	15 Business Days									
Total for Actuary		5	1	67%		5				

TO: Becky Kent, B.A., Chair and Members of the Halifax Regional Water Commission Board as Administrators for Halifax Water's Supplemental Pension Benefit Plan

SUBMITTED BY:  Digitally signed by Allan Campbell
Date: 2022.03.15 15:15:20 -03'00' *On behalf of:*

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

APPROVED:  Digitally signed by Cathie O'Toole
Date: 2022.03.15 15:36:36 -03'00' _____
Cathie O'Toole, MBA, FCPA, FCGA, ICD.D
General Manager

DATE: March 9, 2022

SUBJECT: **Halifax Water Supplemental Pension Plan Report**

ORIGIN

On April 28, 2016, the Halifax Water Board (the "Board") approved the creation of a Supplementary Pension Benefit Framework (Item #2Cb) for non-union staff members, to become effective January 1, 2017.

BACKGROUND

The Halifax Regional Water Commission Employees' Pension Plan (the "DB Plan") is a registered, defined benefit plan providing pension benefits on pensionable earnings capped at \$140,950, which represents the Canada Revenue Agency (CRA) maximum annual pensionable earnings as of January 1, 2015. This cap will remain in place for a period of 8 years starting in 2015, and will increase 1% thereafter.

Pursuant to the framework approved by the Board as noted above, the Halifax Water Employees' Defined Contribution Plan (the "DC Plan") and a Notional Retirement Compensation Arrangement (the "NRCA") were established, effective January 1, 2017.

1 DC Plan:

A registered, defined contribution plan providing pension benefits on members' pensionable earnings between the DB Plan cap and CRA maximum, annual pensionable earnings threshold. Members contribute at a rate of 9% of pensionable earnings, which is matched by Halifax Water.

2 NRCA:

A non-registered agreement with individual members which provides pension benefits on members' earnings over the CRA maximum, annual pensionable earnings threshold. The NRCA is a non-contributory arrangement between Halifax Water and individual members. Halifax Water contributes 9% of a members eligible earnings annually, holding these funds in trust for members until their retirement, termination or death. Interest applied to members' accounts is based on the annual CANSIM rate.

DISCUSSION

The Financial Report from Industrial Alliance (see Appendix A attached) reports the revenues and disbursements for the DC Plan during the January 1, 2021 to December 31, 2021 period. The balance at the beginning of the period was \$33.2 thousand. Revenues for the period consisted of new deposits of \$18.6 thousand, and investment revenue of \$4.1 thousand. Disbursements totaled \$8.2 thousand, leaving a balance at the end of the period of \$47.7 thousand.

As of December 31, 2021, the liability with respect to NRCA member accounts was \$51.6 thousand, with contributions of \$12.2 thousand in 2021, and interest applied totaling \$0.4 thousand. For further details on the NRCA, see Appendix B attached.

ATTACHMENT

APPENDIX A- Industrial Alliance Financial Group, Financial Report for the Halifax Water Employees' Defined Contribution Plan – January 1, 2021 to December 31, 2021

APPENDIX B- Notional Retirement Compensation Arrangement Dashboard at December 31, 2021

Report Prepared by:

**Heather
Britten**

Digitally signed by
Heather Britten
Date: 2022.03.15
15:12:50 -03'00'

Heather S. Britten, Quality Assurance Officer (902) 490 1895

Financial Reviewed by:

On behalf of:

Louis de Montbrun, CPA, CA, Director, Corporate Services/CFO
(902) 490-3685

Period from January 1, 2021 to December 31, 2021

Contract 42730-001

Summary of transactions

	<u>Book value</u>	<u>Market value</u>
Balance at the beginning of the period	\$ 33,225.12	\$ 33,225.12
Revenues		
New deposits	\$ 18,617.60	\$ 18,617.60
Investment revenues	\$ 4,121.70	\$ 4,121.70
Total revenues	\$ 22,739.30	\$ 22,739.30
Disbursements		
Deaths, withdrawals, other	\$ 7,787.50	\$ 7,787.50
Fees	\$ 423.80	\$ 423.80
Taxes	\$ 51.38	\$ 51.38
Total disbursements	\$ 8,262.68	\$ 8,262.68
Balance at the end of the period	\$ 47,701.74	\$ 47,701.74

ITEM # 3-I

Halifax Water Board

March 24, 2022

APPENDIX B

**Halifax Water
Notional Retirement Compensation Arrangement**

Annual Summary					
Year	Opening Balance	Contributions	Interest Earned	Withdrawals	Closing Balance
2017	\$0.00	\$10,070.37	\$7.79		\$10,078.16
2018	\$10,078.16	\$10,149.62	\$121.76		\$20,349.53
2019	\$20,349.53	\$11,878.05	\$310.44		\$32,538.03
2020	\$32,538.03	\$15,508.59	\$338.48		\$48,385.10
2021	\$48,385.10	\$12,222.11	\$408.94	(\$9,447.68)	\$51,568.47

TO: Becky Kent, B.A., Chair and Members of the Halifax Regional Water Commission Board

SUBMITTED BY: E. Jeff Myrick
Digitally signed by E. Jeff Myrick
Date: 2022.03.17 10:35:47 -03'00'
Jeff Myrick, Manager of Communications and Public Affairs

APPROVED: Cathie O'Toole
Digitally signed by Cathie O'Toole
Date: 2022.03.17 10:34:44 -03'00'
Cathie O'Toole, MBA, FCPA, FCGA, ICD.D
General Manager

DATE: March 15, 2022

SUBJECT: 2021 Annual Customer Survey

INFORMATION REPORT

ORIGIN

Operational Requirement, Corporate Balanced Scorecard (CBS) Performance Measurement

BACKGROUND

Since 2000, Halifax Water has engaged an external research firm to compile information on a number of topics critical to the operation of the utility as it relates to public confidence and perception. The questions generally focus on customer satisfaction with services and products provided for water, wastewater and stormwater service delivery.

Information from the Halifax Urban Report is based on telephone interviews conducted from November 10 to November 23, 2021. The overall results are based on 400 interviews with individuals from the Halifax Municipality population. A sample of 400 respondents would be expected to provide results accurate to within plus or minus 4.9 percentage points in 95 out of 100 samples.

DISCUSSION

Satisfaction with Halifax Water's overall service delivery remains high at 96%, consistent with the last four years. Similarly, satisfaction with Halifax Water's products and services remains high, with 90% customers satisfied, which is a slight drop of two per cent from 2020.

Overall, customer satisfaction with various service metrics is consistent with 2020. Results this year across key survey categories indicates that residents continue to rate Halifax Water's performance highly across a multitude of categories, with a high proportion of customers surveyed providing very positive ratings for the indicators related to Water Quality and Service Excellence.

Two of our Critical Success Factors as outlined in the Corporate Balanced Scorecard are: **High Quality Drinking Water** and **Service Excellence**. In these 2 categories the target for organizational indicators is set high. Our target is 85% of customers rating drinking water as either good or excellent, and 95% of customers satisfied or very satisfied with overall service from Halifax Water. The target for satisfaction with overall service was increased from 90% last year to 95% in 2021/22.

This year's results indicate 96% of customers perceive water quality as good or excellent, compared to 84% in 2020. A sub-category surveyed under drinking water quality is Water Safety. In this category, Halifax Water came in at 95% of customers rating our water as safe or very safe, compared to 96% in 2020. These consistently excellent numbers show our customers continue to place a high value on the overall quality and safety of our water across the region.

For Service Excellence, two categories address this broader topic, Satisfaction with Halifax Water's Products & Services, and Satisfaction with Halifax Water's Overall Service Delivery. In these categories, the results remain high at 90% and 96% respectively.

The overall Customer Service Index score has increased to 79.5% from 77.9% in 2020, and Some key highlights from the survey:

- Awareness of the lead service line replacement program has increased seven per cent from 2020, however approximately three quarters of those surveyed were not aware of the program.
- Awareness of the emergency assistance program (H2O Fund) has increased slightly (four percent) but remains low.
- Approximately half of those surveyed (49%) could identify that treated wastewater from their property would flow to Halifax Harbour, Bedford Basin or Atlantic Ocean.
- One half of respondents reported receiving stormwater service and 79% of those were satisfied with the service.
- In its first year, awareness of the Customer Connect Portal was at 15%. It launched in November 2020.

- There is modest interest amongst customers to use a customer portal, with 42% being very or somewhat interested to use a customer portal. Mostly with interest in monitoring water consumption, managing account information and paying bills online.
- There is significant interest in paperless billing, with 70% of respondents indicating that they would definitely/probably, sign up for Paperless Billing

Halifax Water's services continue to play a major role in helping to ensure public health and environmental protection during the COVID-19 pandemic. Customers depend on the essential water, wastewater and stormwater services we provide. Strong customer support is critical as the utility makes short and long term investments in critical infrastructure, adapts to and mitigates climate change impacts, maintains compliance in an ever evolving regulatory environment, and fulfills its core mandate of protection of public health and the environment.

Survey results this year continue to show Halifax Water is on the right path in many key categories, but staff across the organization must continue to engage customers in a courteous, efficient, timely manner and work to promote the value of the water, wastewater and stormwater services we provide.

For the benefit of all staff, the survey has been placed on the Halifax Water Intranet.

Staff will be encouraged to take the time to read the survey results and provide any comments or suggestions they might have.

ATTACHMENT

1. Narrative Research 2021 Quality of Service Study – Infographic
2. Narrative Research 2021 Quality of Service Study - Final Report

Report Prepared by:

E. Jeff Myrick

Digitally signed by E. Jeff
Myrick
Date: 2022.03.17
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Halifax Water

2021-22 Quality of Service

Key Highlights

Methodology: 320 telephone surveys with Halifax Residents (288 Water Customers, 199 Stormwater Customers, and 205 Wastewater Customers); Data Collection: November 10 – 23, 2021
~316 telephone surveys with Halifax Water Customers; Data Collection: February 7 – 20, 2022



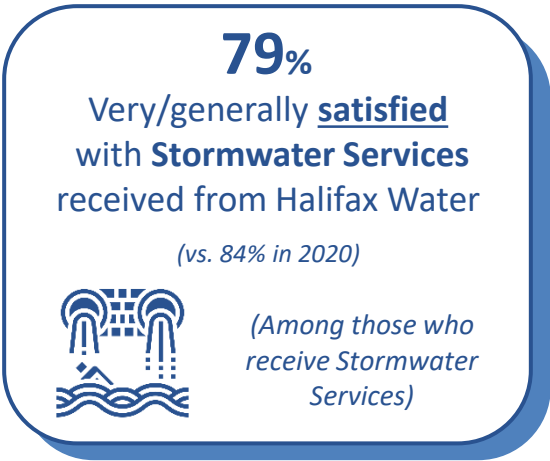
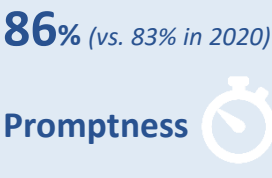
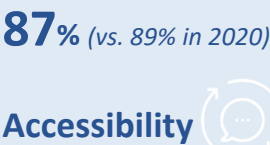
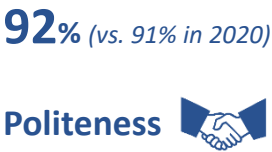
~Rate quality of water received in household as **excellent/good**



Among Water Customers

Very/generally **satisfied** with Halifax Water staff's...

(Among those who have had a service interaction)



Most Preferred Method for Accessing Information Related to Halifax Water's Programs and Services (Key Mentions)



Internet (general) **55%**
(vs. 48% in 2020)



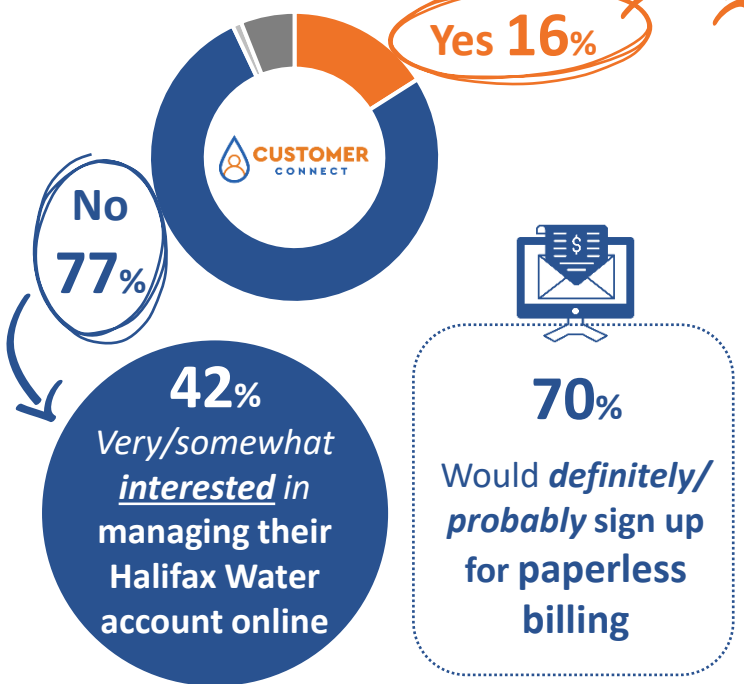
Halifax Water website **20%**
(vs. 16% in 2020)

Program Awareness

25% **Aware** of Halifax Water's **enhanced program to assist residential customers with replacing their lead water service lines***
(vs. 18% in 2020)

16% **Aware** that Halifax Water has an **emergency financial assistance program** to help low income customers
(vs. 14% in 2020)

Currently Using Customer Connect Portal



70%
Would **definitely/probably** sign up for **paperless billing**

Online Services Used on Customer Connect Portal

87% Managing your account information

84% Tracking billing

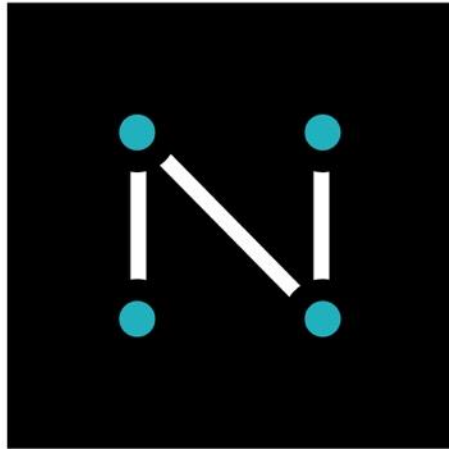
57% Monitoring your water consumption

ITEM # 4-I

Halifax Water Board

March 24, 2022

ATTACHMENT 2



NARRATIVE
R E S E A R C H



Atlantic Quarterly

Commissioned Results
Autumn (Q4) 2021

February 2022

Prepared for:
Halifax Water



- Data was collected in two components, both involving random samples of residents.
- The customer service component was conducted via a random telephone survey with **400 adults in HRM** aged 18+ years. Of these 288 received water services, 168 received storm water services, and 201 received wastewater services from Halifax Water. Altogether, 320 respondents received at least one of the above services.
- The water quality and safety assessment component was conducted with a random telephone survey of 435 adult HRM residents, of which 316 received their water from Halifax Water.



- Data collection dates:
 - Customer Service: November 10 – November 23, 2021.
 - Water Quality and Safety: February 7- February 20, 2022.



- Margin of error: (percentage points, 19 times out of 20)
 - n=400 - ± 4.9
 - n=288 - ± 5.8
 - n=168 - ± 7.6
 - n=201 - ± 6.9
 - n=318/320 - ± 5.5



- Current results are compared with tracking data from previous Halifax Urban Report surveys conducted from 2000 to 2021
- Results may not equal 100 percent due to rounding.



The following provides highlights of Halifax Water's commissioned research.

- A large majority of Halifax Water customers agree that the **quality of the water** they receive is excellent or good. Halifax Water customers are also more likely than those who source their water from a well to rate the quality of their water as excellent or good.
- Virtually all Halifax Water customers are confident that their **water is safe**, with results similar to well owners.
- Satisfaction with Halifax Water's **overall service delivery** and **products and services** remains high, with the vast majority of customers satisfied. Moreover, satisfaction is also high when it comes to **reliability** of service, as well as with various **aspects of the interactions** with Halifax Water staff.
- Satisfaction among **stormwater** and **wastewater** customers is also high, although satisfaction with stormwater services is comparatively less robust.
- Awareness of the **primary source of municipal tap water**, as well as **where waste water goes** remains limited.
- Awareness of **Halifax Water's enhanced program to replace lead water service lines** has increased modestly since last year, with one in four currently aware. Among the approximately one-fifth self-identifying as being in the target segment (based on age of home and geography), interest in the program is moderately strong.
- Awareness of Halifax Water's **emergency financial assistance program** for low income customers remains limited.
- Halifax Water's customers' most **preferred source of information about Halifax's Water's programs and services** remains the Internet for a large segment of customers. Only one-fifth turn to Halifax Water's website as a preferred source, suggesting an opportunity to further promote the website as a source of information, rather than turning to a general internet search.
- One in six customers are using the **Customer Connect Portal**, with most using it to manage their account information or track their billing, with fewer using it to monitor their water consumption.
- There is an opportunity to promote the portal, as among those not using it, few have received information about it. Indeed, a large majority of these customers are interested in it, with checking water consumption viewed as the primary benefit.
- There is significant interest in **paperless billing** from Halifax Water, should it become available. In fact, one-half of customers indicated they would **definitely** sign up for it, if it were to be available. A preference for a hard copy is the key contributor to reluctance to sign up.

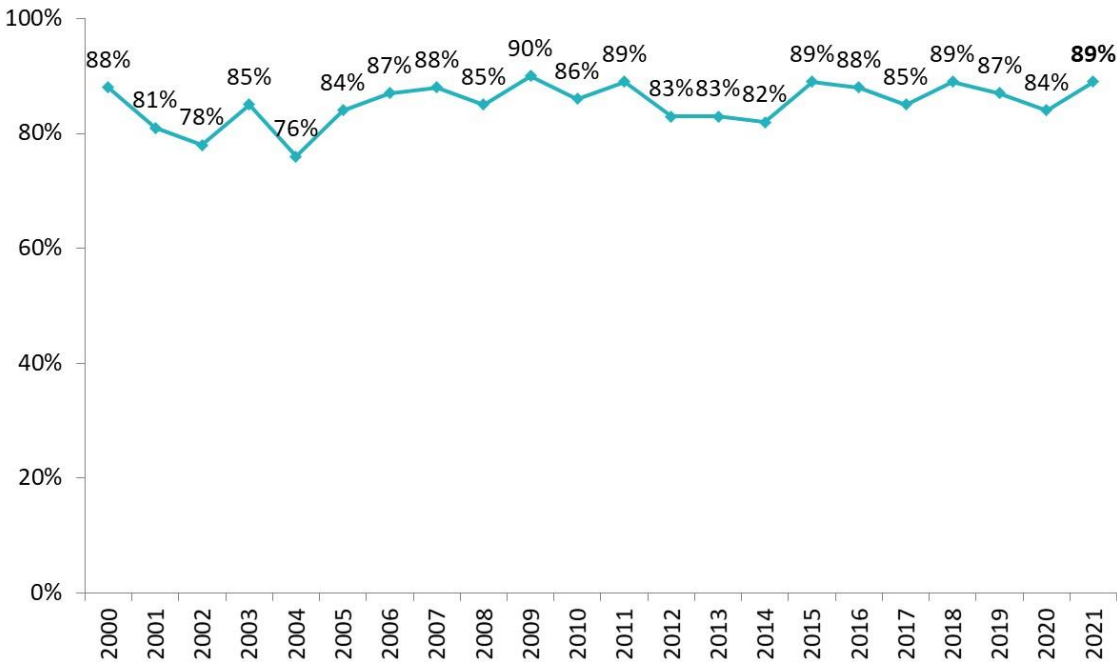


Water Assessment



Water Quality Assessment

% Saying 'Excellent / Good'; Among Halifax Water Customers



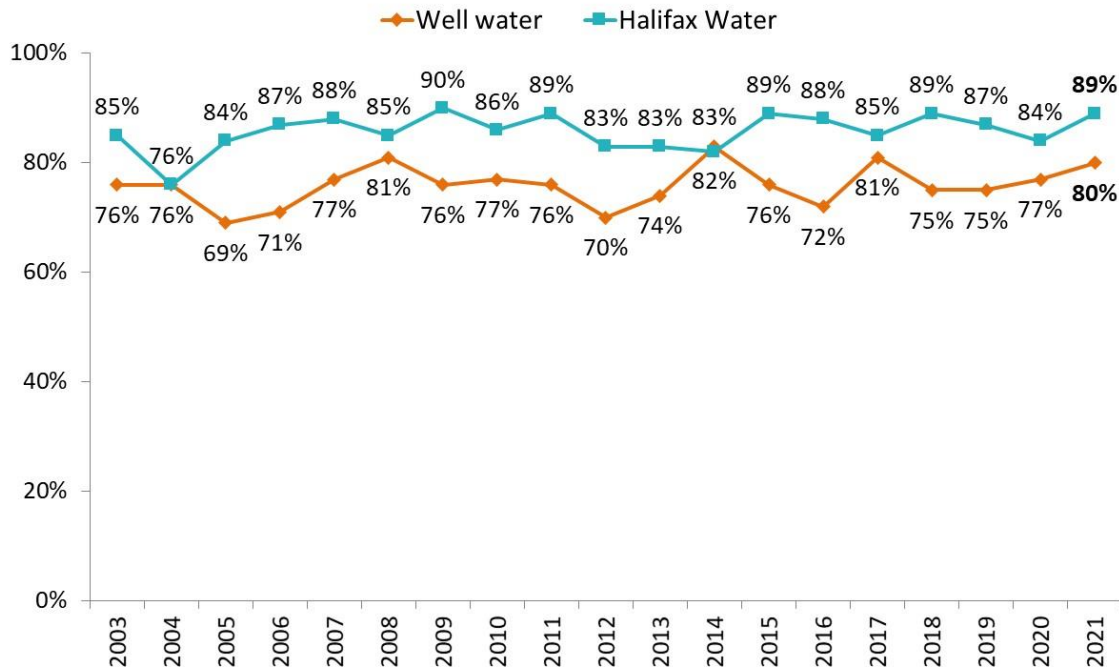
Q.W1: Overall, how would you rate the quality of water you receive in your household? Would you say it is excellent, good, only fair, or poor? (n=316)

A vast majority of Halifax Water customers indicate that the quality of the water they receive is excellent or good.

Nine in ten (89%) Halifax Water customers affirm that the quality of the water in their household is excellent or good, showing a slight increase from results observed last year.

One-half (49%) of Halifax Water customers state that the quality of their water is excellent, while nearly four in ten (38%) state that the quality of their water is good.

Water Quality Assessment Excellent/Good



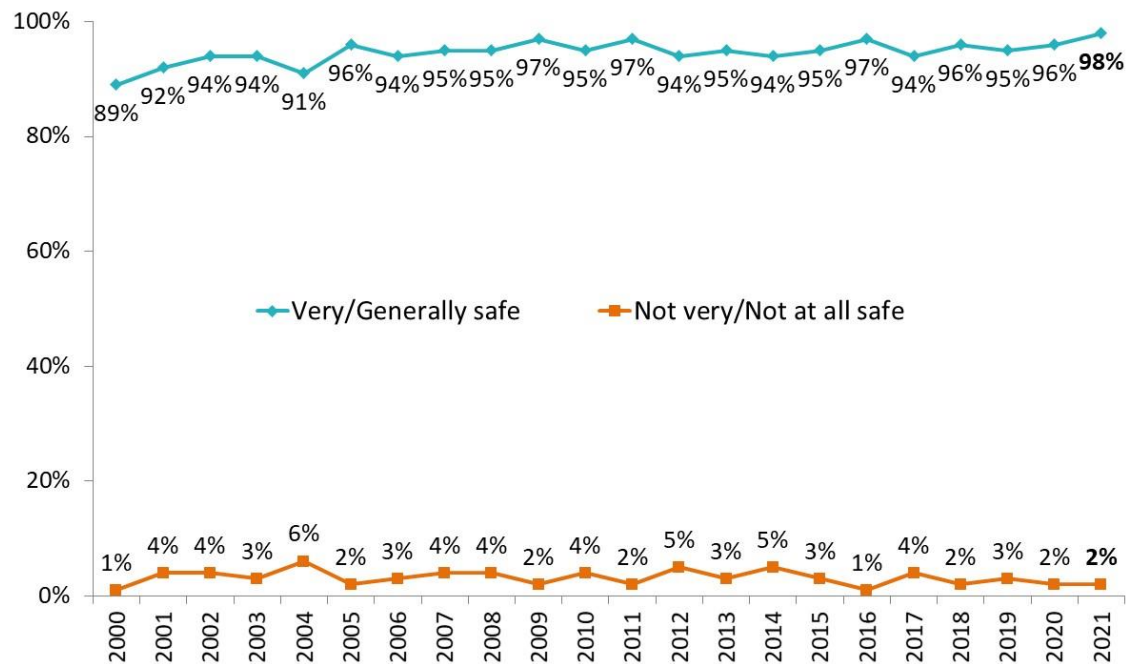
Q.W1: Overall, how would you rate the quality of water you receive in your household? Would you say it is excellent, good, only fair, or poor? (Halifax Water n=316, Well n=101) *Note: In 2008, HRWC became Halifax Water.*

Halifax Water customers are more likely to rate the quality of their water as excellent/good compared to those who source water from a well.

While both customers of Halifax Water and those who receive water from a well give high ratings to the quality of the water they receive, there is a nine percentage point difference in assessments of water quality, with Halifax Water customers being more likely to rate the quality of their water as higher.

Those aged 18-34 are less likely to give higher ratings for water quality, as are those with household incomes of \$50,000 or less, and those who only have a high school education or less.

Water Safety Assessment Among Halifax Water Customers



Q.W2: Overall, how safe would you say your water is? Would you say it is very safe, generally safe, not very safe, or not at all safe? (n=316)

Virtually all Halifax Water customers feel that their water is very or generally safe.

Positively, ninety-eight percent of Halifax Water customers state that their water is very or generally safe, showing results that are stable with those observed last year.

Two-thirds (64%) of Halifax Water customers rate their water as very safe, while one-third (34%) rate their water as generally safe. Results are similar to those with well water - two-thirds (63%) of well owners also rate their water as very safe, while three in ten (30%) well owners rate their water as generally safe.

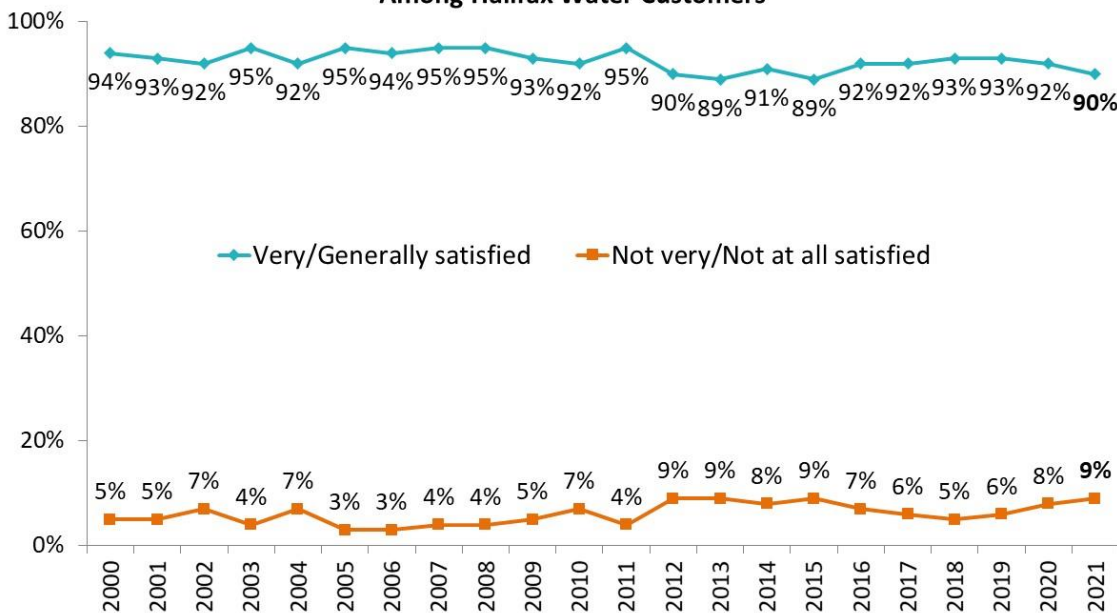
Those aged 18-34 are less likely to give higher ratings for water quality, as are those with household incomes of \$50,000 or less, and those who only have a high school education or less.



Water Services

70%
Receive water
services from
Halifax
Water

Satisfaction with Halifax Water's Products and Services Among Halifax Water Customers



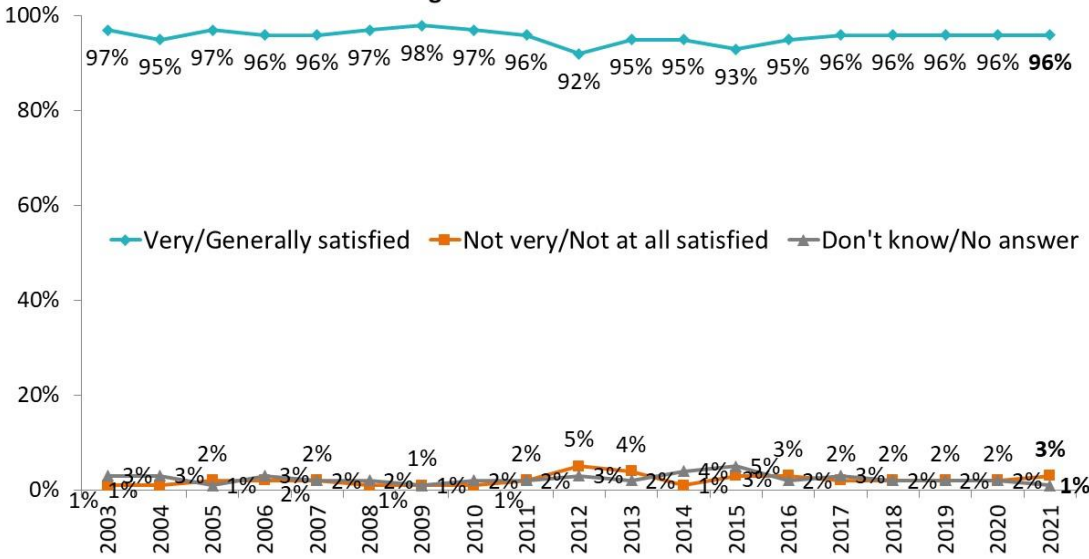
Q.W5: [ASK ONLY IF 'YES, RECEIVE WATER FROM HALIFAX WATER' IN Q.W4] All things considered, would you say you are very satisfied, generally satisfied, not very satisfied, or not at all satisfied with the products and services you receive from Halifax Water? (n=288)

Satisfaction with Halifax Water's products and services remains very robust and on par with previous results.

Nine in ten (90%) customers report being *very or generally satisfied* with the **products and services** received from Halifax Water, stable with last year's results. Ratings of satisfaction are high across the regions and demographic subgroups. Overall satisfaction is robust across the population. (Table W5)

Satisfaction with Halifax Water's Overall Service Delivery

Among Halifax Water Customers



Q.W6a: [ASK ONLY IF 'YES, RECEIVE WATER FROM HALIFAX WATER' IN Q.W4] For each of the following, please tell me whether you are very satisfied, generally satisfied, not very satisfied, or not at all satisfied with the service you have received from Halifax Water: Overall service delivery – How well Halifax Water delivers its services to you? (n=279)

Note: The 2020 responses for 'Have not used this Halifax Water service' and 'Have not had any service interaction with Halifax Water Staff' have been removed from this table.

Satisfaction with Halifax Water's produces and services remains very robust and on par with previous results.

Satisfaction with Halifax Water's **overall delivery of service** remains widespread and is relatively stable compared with previous findings. Specifically, 96 percent of residents offer a rating of *very* or *generally satisfied*, consistent with previous years. Satisfaction in this regard is widespread regionally and across the population. (Table W6a)

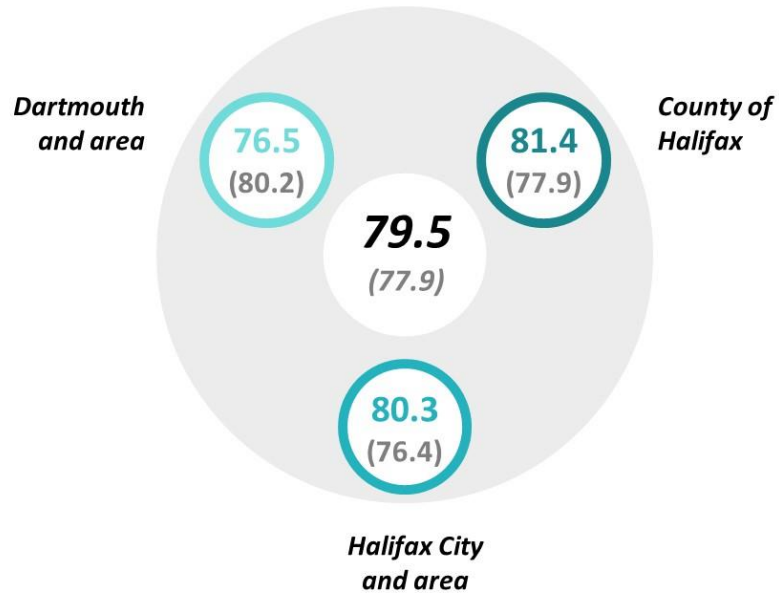
Satisfaction with various aspects of Halifax Water’s service remains robust and on par with the preceding year.

More than nine in ten residents are satisfied with the **reliability of Halifax Water’s service**, as well as with the **politeness** of staff. Just under nine in ten are satisfied with staff **accessibility**, **ability to answer questions**, and **promptness**. (Tables W6b-f)

Satisfaction with Halifax Water’s Service Among Halifax Water Customers Very/Generally Satisfied																			
	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Reliability	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	94%	93%
Politeness	86%	88%	90%	85%	86%	87%	80%	84%	82%	78%	74%	81%	79%	77%	82%	79%	83%	91%	92%
Staff accessibility	85%	88%	91%	83%	84%	87%	84%	91%	84%	75%	72%	83%	76%	78%	80%	77%	81%	89%	87%
Ability to answer questions	84%	85%	90%	83%	80%	84%	80%	83%	78%	72%	67%	74%	72%	74%	74%	72%	77%	86%	86%
Staff promptness	85%	86%	90%	81%	82%	83%	82%	87%	80%	73%	67%	77%	73%	76%	76%	72%	78%	83%	86%

Q.W6b-f: [ASK ONLY IF 'YES, RECEIVE WATER FROM HALIFAX WATER' IN Q.W4] For each of the following, please tell me whether you are very satisfied, generally satisfied, not very satisfied, or not at all satisfied with the service you have received from Halifax Water. (2021 n=162-191)
Note: The 2020 and 2021 responses for 'Have not used this Halifax Water service' and 'Have not had any service interaction with Halifax Water Staff' have been removed from this table.

2021 Customer Service Index



Halifax Water's Customer Service Index reflects a strong customer experience.

Once again, this year, Narrative Research is pleased to present Halifax Water with a Customer Service Index (CSI). To provide an overall assessment of Halifax Water's service performance, the CSI this year was calculated based on customers' ratings on seven service-focused questions, namely:

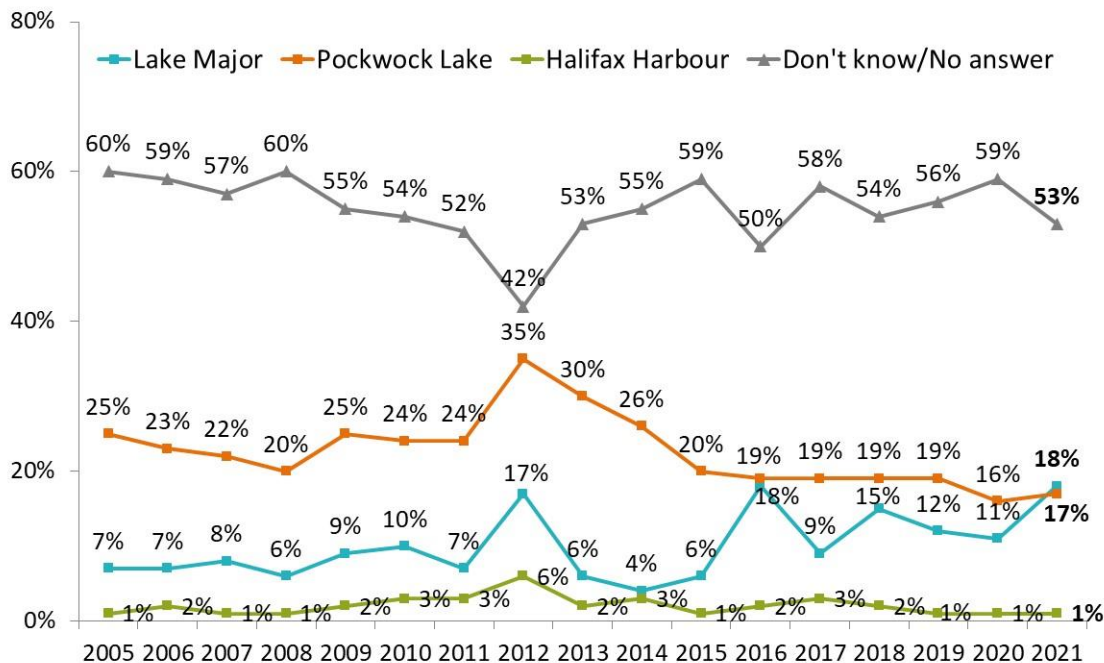
- Overall satisfaction with the Halifax Water (QW5);
- Satisfaction with overall service delivery (QW6a);
- Satisfaction with accessibility of Halifax Water staff (QW6b);
- Satisfaction with promptness of Halifax Water in responding to questions (QW6c);
- Satisfaction with Halifax Water's ability to answer questions (QW6d);
- Satisfaction with the politeness of Halifax Water staff (QW6e); and
- Satisfaction with the reliability of Halifax Water (QW6f).

In calculating Index scores, ratings on these seven questions were averaged and transformed into a scale ranging from a low of 0 to a high of 100. Thus, the maximum possible score on the CSI is 100, while the minimum is 0. Any question to which a customer who has had a service interaction with Halifax Water did not respond was eliminated from the calculation, with the Index score for that customer being calculated on the remaining questions.

The Customer Service Index stands at 79.5 this year, not appreciably different from the preceding year. Customers in Dartmouth and surrounding areas have a slightly lower Index score compared with others, in contrast to last year.

Primary Source of Municipal Tap Water

Total Top Mentions, Among Halifax Water Customers



Q.W9: [IF 'YES, RECEIVE WATER FROM HALIFAX WATER' IN Q.W4] To the best of your knowledge, which body of water is the primary source of your tap water supplied by Halifax Water? Probe once: Any other sources? (n=288)

There continues to be uncertainty regarding Halifax area residents' knowledge of the source of their municipal tap water.

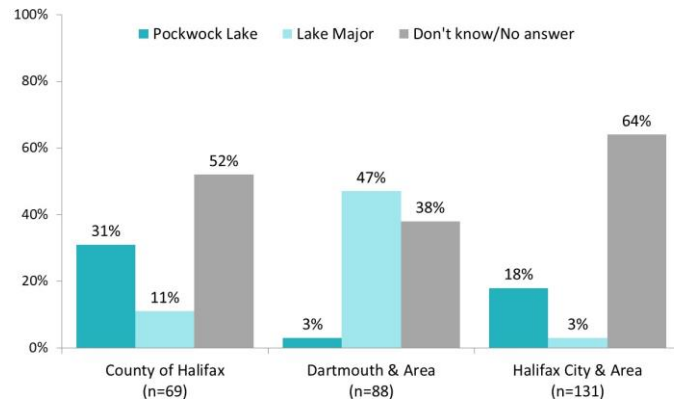
Approximately one-half of Halifax Water customers (53%, compared with 59% last year) **cannot name the source** of their tap water.

The top mentions are **Lake Major** (18%) and **Pockwock Lake** (17%).

Across the population, younger customers, and those with annual household income of \$100,000 or less are more likely than others to be unsure of the source of their tap water. Regionally, Dartmouth area residents are most aware and are most likely to identify Lake Major (47%). (Table W9)

Primary Source of Municipal Tap Water

Key Mentions by Area, Among Halifax Water Customers

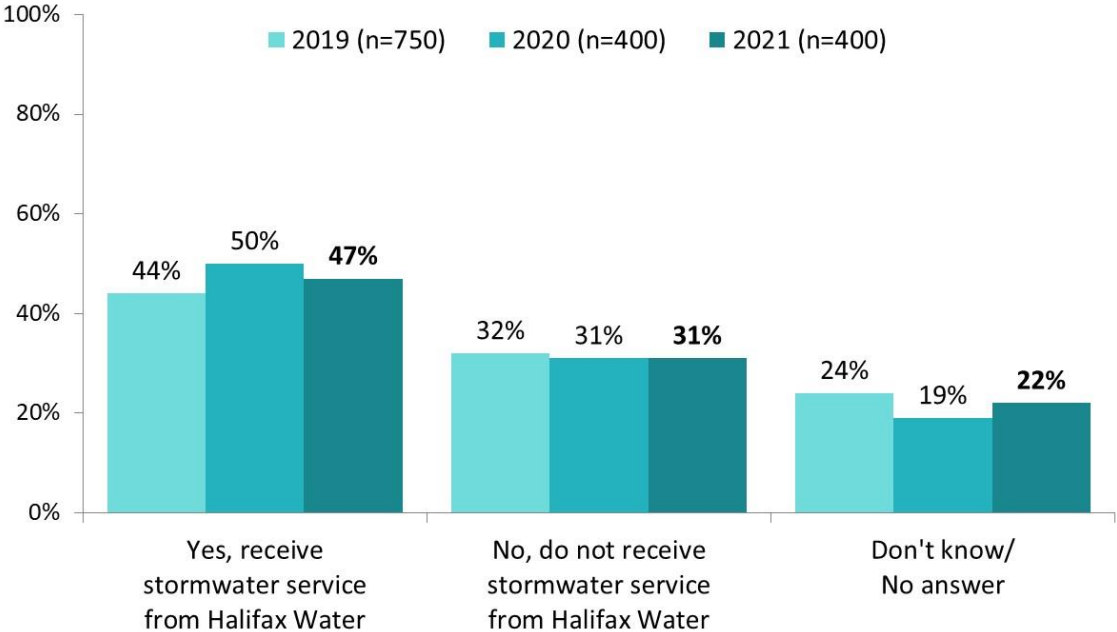


Q.W9: [IF 'YES, RECEIVE WATER FROM HALIFAX WATER' IN Q.W4] To the best of your knowledge, which body of water is the primary source of your tap water supplied by Halifax Water? Any other sources?



Stormwater Services

Household Receives Stormwater Service From Halifax Water



Q.W40: Stormwater service includes the maintenance of ditches and culverts in rural and suburban areas, and underground pipes and pumping systems in urban areas. Does your household receive stormwater service from Halifax Water?

Approximately, half of residents receive stormwater services from Halifax Water.

Again, this year, residents were asked if their household receives stormwater service from Halifax Water. One-half of residents reported receiving this service from Halifax Water (47% compared 50% last year), while three in ten residents indicated they did not. Similar to preceding years, two in ten residents were unsure in this regard (22%).

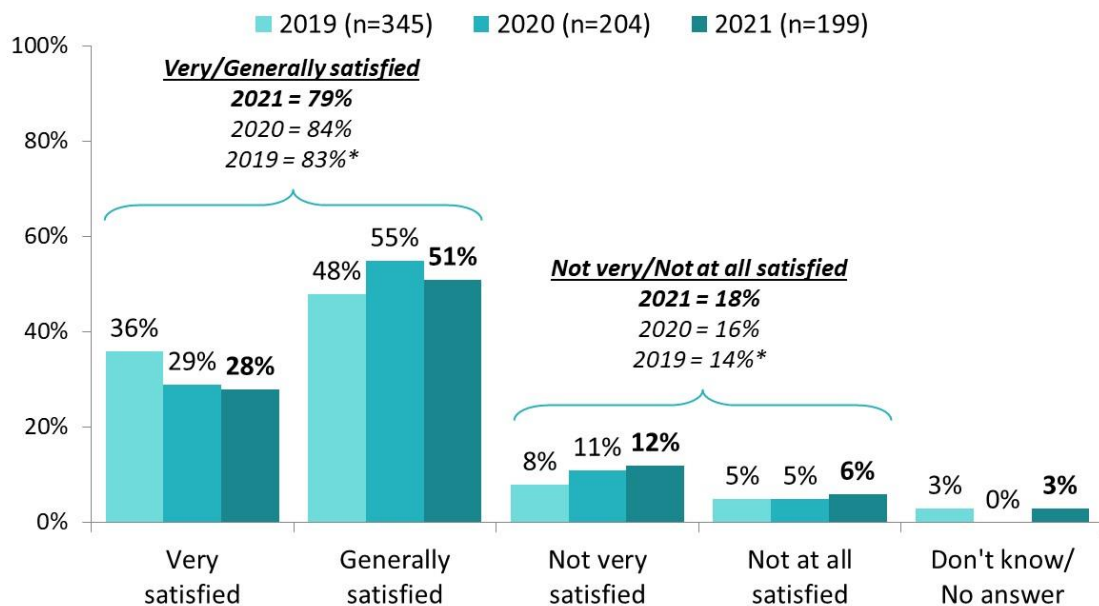
The likelihood of confirming they receive their stormwater services from Halifax Water is higher among those with post secondary education completed and those with higher household incomes. This may be in part due to familiarity, especially in the case of household incomes, as those in lower income households are more inclined to say they do not know. (Table W40)

There are slight differences across areas.

Receive Stormwater Service from Halifax Water by Area	
Dartmouth and area (n=98)	54%
Halifax City and area (n=147)	49%
County of Halifax (n=155)	42%

Opinion of Stormwater Service

Among Those Who Receive Stormwater Service From Halifax Water



Q.W41: [IF 'YES, RECEIVE STORMWATER SERVICE FROM HALIFAX WATER' IN Q.W40] All things considered, would you say you are very satisfied, generally satisfied, not very satisfied, or not at all satisfied with the stormwater service you receive from Halifax Water? *Due to rounding.

Satisfaction with stormwater services remains strong and stable.

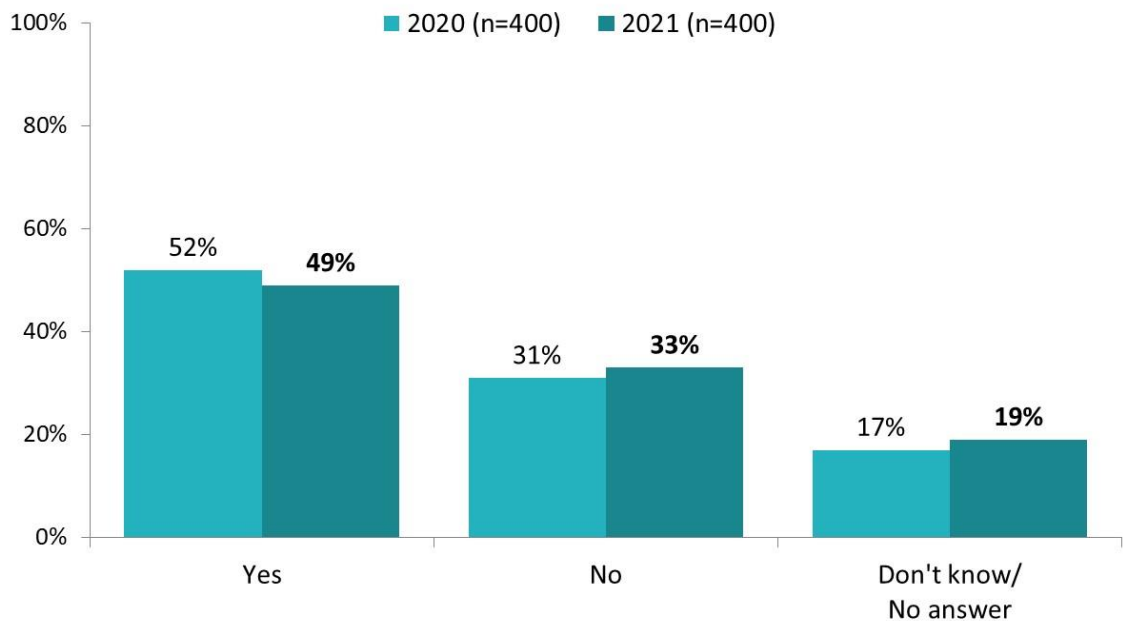
Among those who receive stormwater service from Halifax Water, a solid majority (79%) are either *very* or *generally satisfied* with the service. Results are similar to preceding years.

Regionally, residents of Dartmouth area (85%) and Halifax are (84%), are more satisfied than those in the surrounding Halifax County area (70%). (Table W41)



Wastewater Services

Household Receives Wastewater Service From Halifax Water



Q.W49: Wastewater service includes the maintenance and operation of wastewater/sewer collection pipes, pumping stations and treatment plants. Does your household receive wastewater service from Halifax Water?

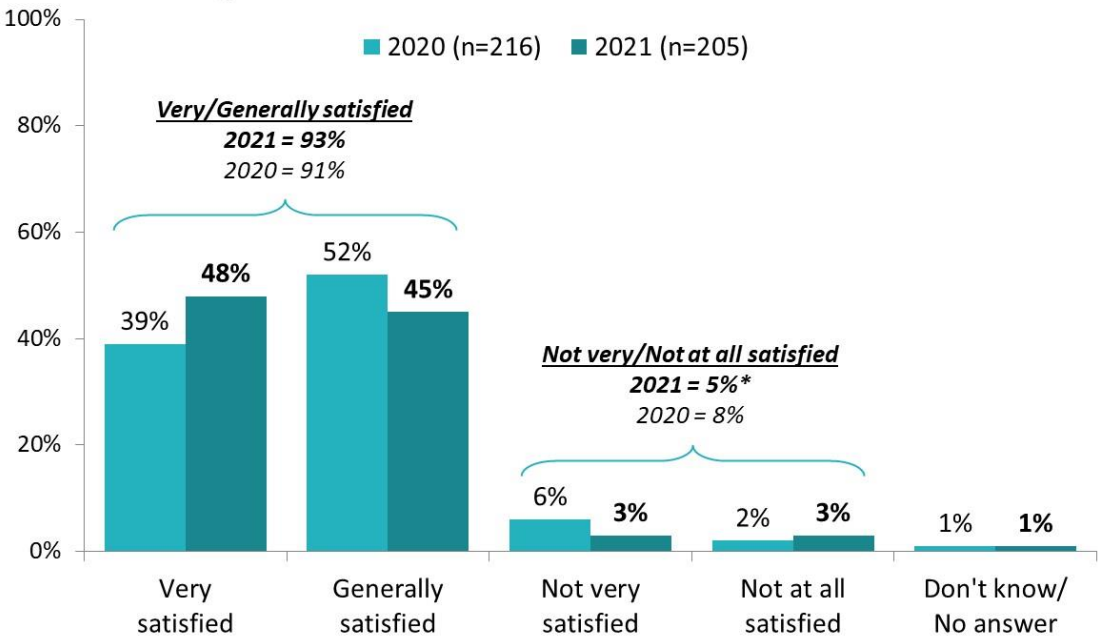
Approximately, half of residents receive wastewater services from Halifax Water.

Similar to last year, one-half of residents (49%) reported receiving this service from Halifax Water. Two in ten are not certain if they do. Residents in the County outside Halifax and Dartmouth areas are less inclined to report they receive wastewater service from Halifax Water. (Table W49)

Receive Wastewater Service from Halifax Water by Area	
Dartmouth and area (n=98)	69%
Halifax City and area (n=147)	56%
County of Halifax (n=155)	31%

Opinion of Wastewater Service

Among Those Who Receive Wastewater Service From Halifax Water



Q.W50: [IF 'YES, RECEIVE WASTEWATER SERVICE FROM HALIFAX WATER' IN Q.W49] All things considered, would you say you are very satisfied, generally satisfied, not very satisfied, or not at all satisfied with the wastewater service you receive from Halifax Water? *Due to rounding.

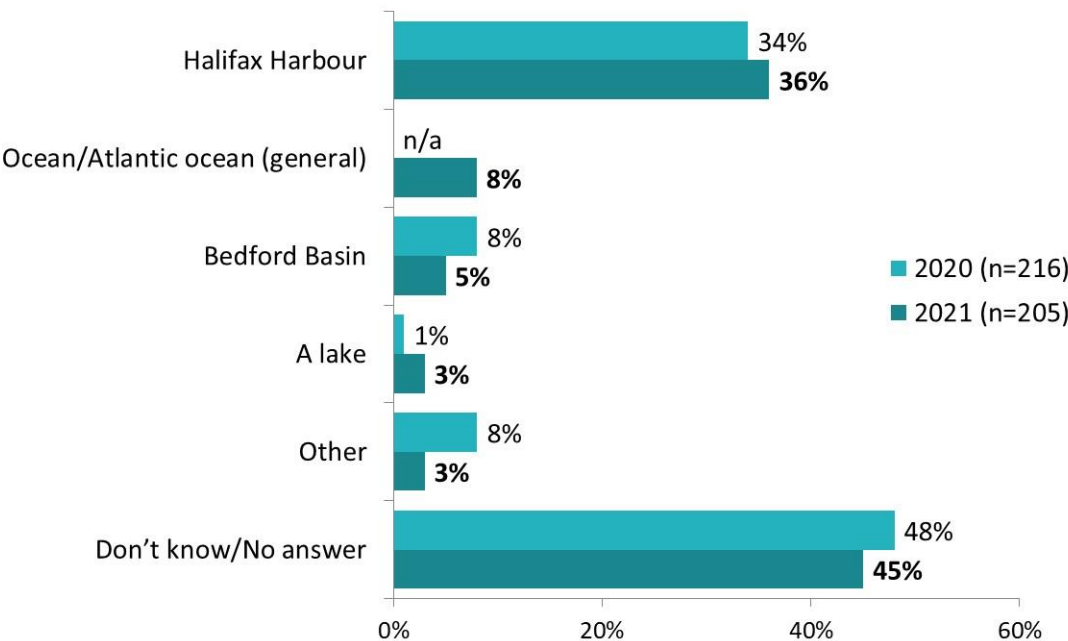
Satisfaction with wastewater services remains high.

More than nine in ten (93%) wastewater customers are either *very* or *generally satisfied* with the service. Satisfaction is robust across customers. (Table W50)

Water Body Which Receives Treated Wastewater

Among Those Who Receive Wastewater Service From Halifax Water

Total Unaided Mentions



Q.W51: [IF 'YES, RECEIVE WASTEWATER SERVICE FROM HALIFAX WATER' IN Q.W49] To the best of your knowledge, which water body eventually receives the treated wastewater from your property?

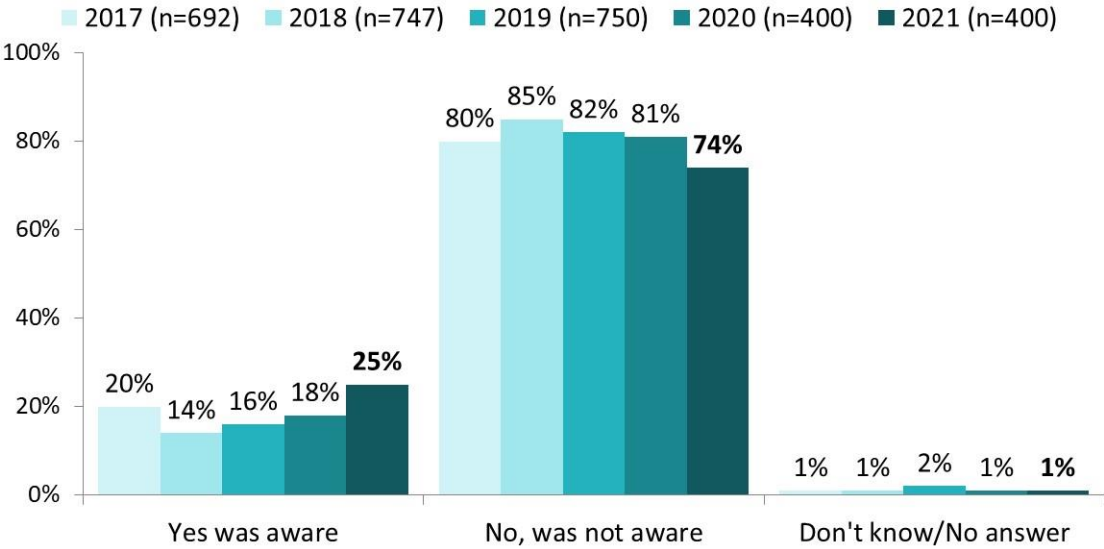
Awareness of which body of water receives treated wastewater remains limited.

Residents who receive wastewater services from Halifax Water were asked which water body eventually receives the treated wastewater from their property. Similar to last year, just under one-half (45%) **did not know** or could not provide a definite response. One-third (36%) mentioned **Halifax Harbour** as the water body that receives the treated wastewater from their property. Eight percent of residents cited the **ocean** while the **Bedford Basin** was cited by five percent. (Table W51)



Lead Replacement Program

Aware of Halifax Water's Enhanced Program to Replace Lead Water Service Lines



Q.W33: On October 1st 2020 Halifax Water launched an enhanced lead service line replacement program for residential customers wanting to replace their lead water service lines that connect the water main in the street to a customer's home. The enhanced program will see Halifax Water replace the full lead service line, which includes both the public and the private section of the service line, at Halifax Water's expense. Prior to today, were you aware of this enhanced program?

Note: Slight change of question wording in 2019 and 2020.

Awareness of Halifax Water's enhanced lead service line replacement program has increased since last year.

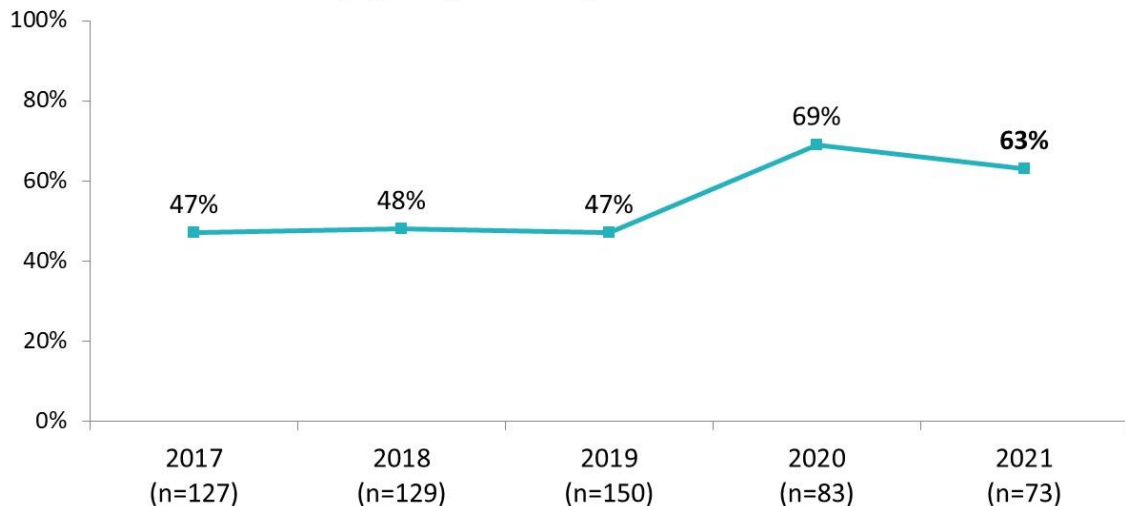
One-quarter of residents are aware of this program, up 7 percentage points from a year ago. The proportion of residents who are aware of this program is highest in the Dartmouth area (34%) and lowest in the surrounding County (19%) with Halifax area (25%) in the middle. Awareness increases with household income. (Table W33)

Have Home Constructed Prior to the 1960s by Area

Overall (n=400)	18%
Halifax City and area (n=147)	31%
Dartmouth and area (n=98)	15%
County of Halifax (n=155)	8%

Interest in Using Halifax Water Funded Lead Service Line Replacement Program within Next Few Years

Among Those Who Have a Home Constructed Prior to the 1960s
% Saying "Very Interested/Somewhat Interested"



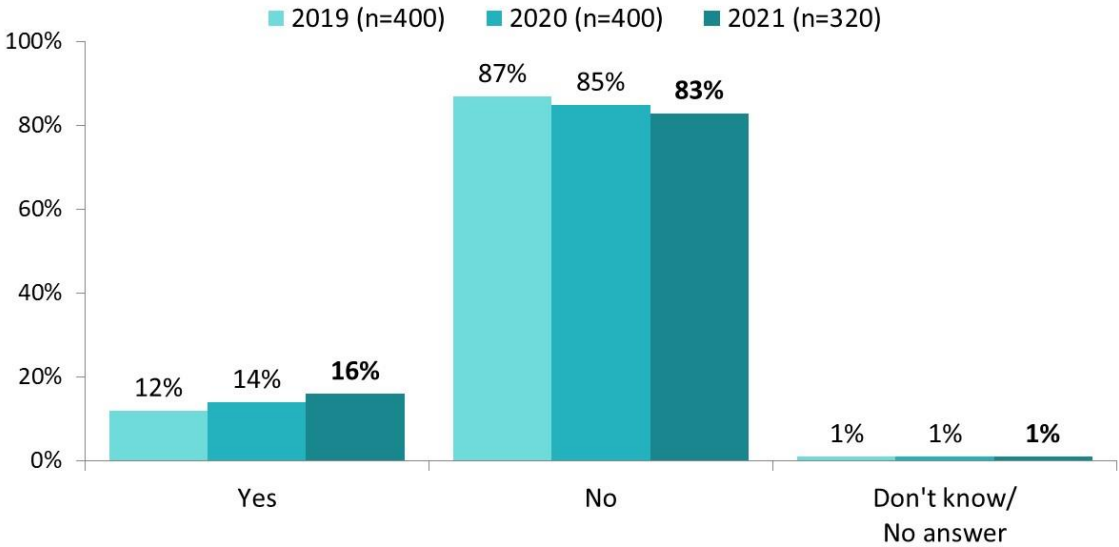
Q.W35: [IF 'YES' IN Q.W34] Lead can enter water through contact with lead water service lines and possibly internal plumbing fixtures such as taps, brass fittings, and lead or tin solder. High levels of lead can lead to serious health issues. Knowing this, are you very interested, somewhat interested, not very interested, or not at all interested in using this Halifax Water funded lead service line replacement program within the next few years? **Due to rounding. Note slight change of question wording in 2019 and 2020.*

Interest in the program among those in the target segment remains moderately strong.

Residents with a home constructed prior to the 1960s within peninsular Halifax and a section of downtown Dartmouth (18%) were asked if they would be interested in using the lead service line replacement program. A large majority (63%) are interested, including 39 percent of residents who are *very interested*. Results are similar to a year ago, although the target area was more clearly defined this year. (Tables W34 and W35)

Aware Halifax Water Has Emergency Financial Assistance Program to Help Low Income Customers

Among Halifax Water Customers



Q.W38: [POSE ONLY IF Q.W4=1 'RECEIVE WATER FROM HALIFAX WATER' OR IF Q.W40=1 'RECEIVE WASTE WATER SERVICE FROM HALIFAX WATER' OR Q.W49-1 'RECEIVE STORMWATER SERVICE FROM HALIFAX WATER'] Are you aware that Halifax Water has an emergency financial assistance program to help low income customers? *Note: in 2021 question only posed of Halifax Water customers.*

Awareness of Halifax Water's emergency financial assistance program for low income customers remains limited.

The vast majority of residents are unaware that Halifax Water has such a program. One in six residents (16%) confirmed being aware of the emergency financial assistance program.

Awareness of the program is higher (although still relatively limited) among those with household incomes of \$100K or more and those with a completed post secondary education. (Table W38)



Communications

There is an opportunity to further promote the Halifax Water website as a source of information.

More than one-half of customers (55%, compared with 48% a year ago) indicate the **Internet (in general)** is their preferred source of information on Halifax Water’s programs and services. This is notably higher than the two in ten (20%) mentioning Halifax Water’s website, although it is positive to note that mentions of Halifax Water’s website have doubled over the past two years.

A small proportion (7%) would contact Halifax Water via phone or email them (5%).

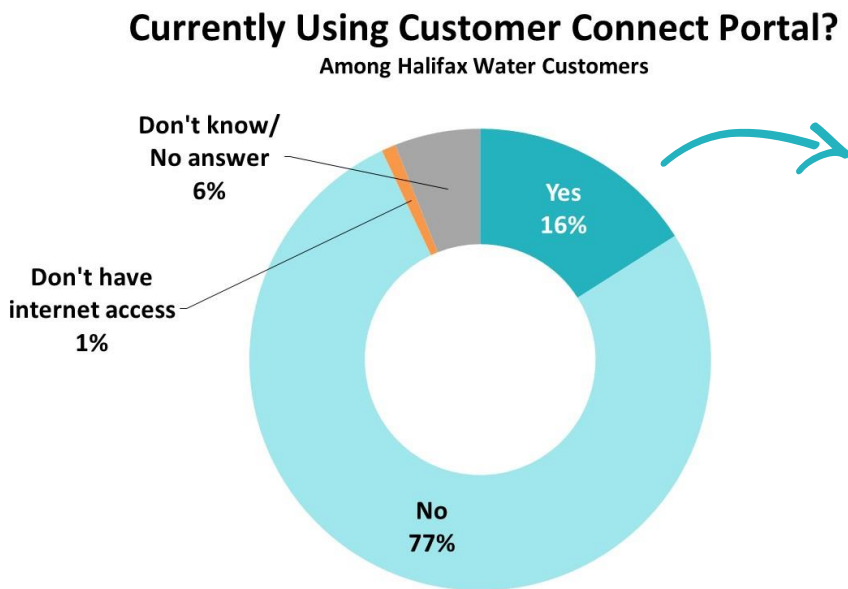
Younger residents are more likely to turn to the Halifax Water website than are older customers. (Table W26)

Preferred Method for Accessing Information About Halifax Water’s Programs and Services Among Halifax Water Customers Key Mentions From Total Unaided Mentions														
	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Internet (general)	48%	53%	52%	51%	50%	54%	63%	58%	59%	52%	41%	56%	48%	55%
Halifax Water website	1%	1%	4%	3%	3%	3%	3%	6%	7%	6%	15%	10%	16%	20%
Phone/Would call them	3%	2%	2%	4%	13%	3%	8%	1%	7%	7%	5%	6%	11%	7%
Email	--	--	--	--	--	--	--	--	--	--	--	--	6%	5%
On the bill	--	--	--	--	--	--	--	--	--	--	--	--	5%	4%

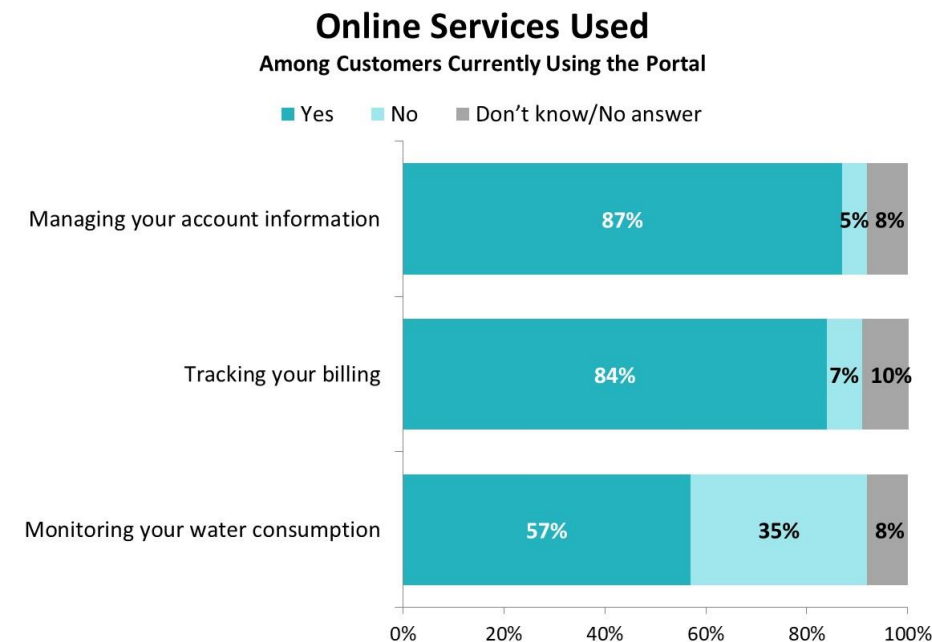
Q.W26: [POSE ONLY IF Q.W4=1 'RECEIVE WATER FROM HALIFAX WATER' OR IF Q.W40=1 'RECEIVE WASTE WATER SERVICE FROM HALIFAX WATER' OR Q.W49=1 'RECEIVE STORMWATER SERVICE FROM HALIFAX WATER'] What is your most preferred method for accessing information related to Halifax Water's programs and services? Any others? (n=320) *Note: in 2021 question only posed of Halifax Water customers.*

One in six customers are using the Customer Connect Portal.

Among the 16% of customers using the Customer Connect Portal, most use it for managing their account information (87%) and tracking their billing (84%), while fewer use it to monitor their water consumption (57%). (Tables W18, W46 a-c)



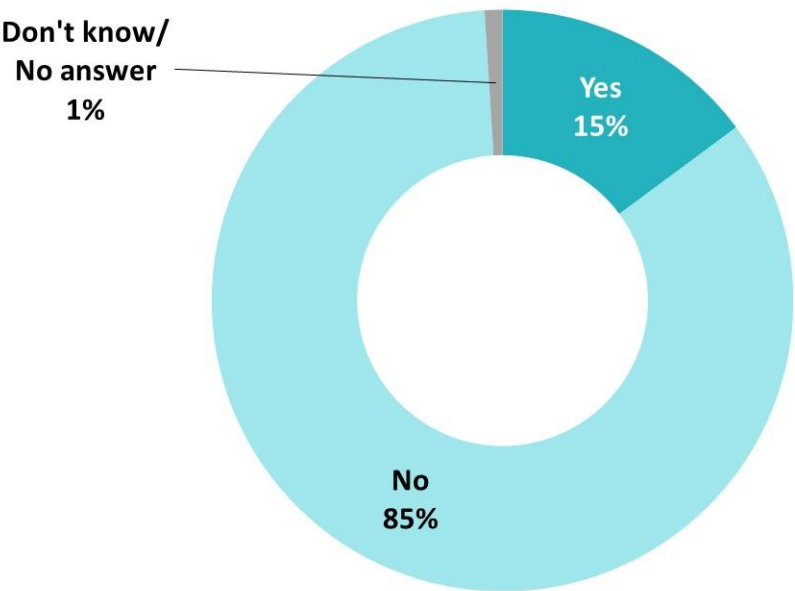
Q.W18: [POSE ONLY IF Q.W4=1 (RECEIVE WATER FROM HALIFAX WATER) OR IF Q.W40=1 (RECEIVE WASTE WATER SERVICE FROM HALIFAX WATER) OR Q.W49-1 (RECEIVE STORMWATER SERVICE FROM HALIFAX WATER)] Halifax Water launched a new "Customer Connect" Portal last year that allows customers to manage their account online. Customers are able to monitor their water consumption and manage their account information. Are you currently using the Customer Connect Portal? (n=320) *New in 2021.*



Q.W46a-c: [POSE ONLY IF 'YES' IN Q.W18] While using the customer connect portal, which of the following online services are you using... (n=50) *New in 2021.*

Seen or Heard Information Related to the Customer Connect Portal?

Among Customers Not Currently Using the Portal



Q.W47: [POSE ONLY IF 'NO' IN Q.W18] Prior to today, have you heard or seen any information related to the Customer Connect Portal? (n=249) *New in 2021.*

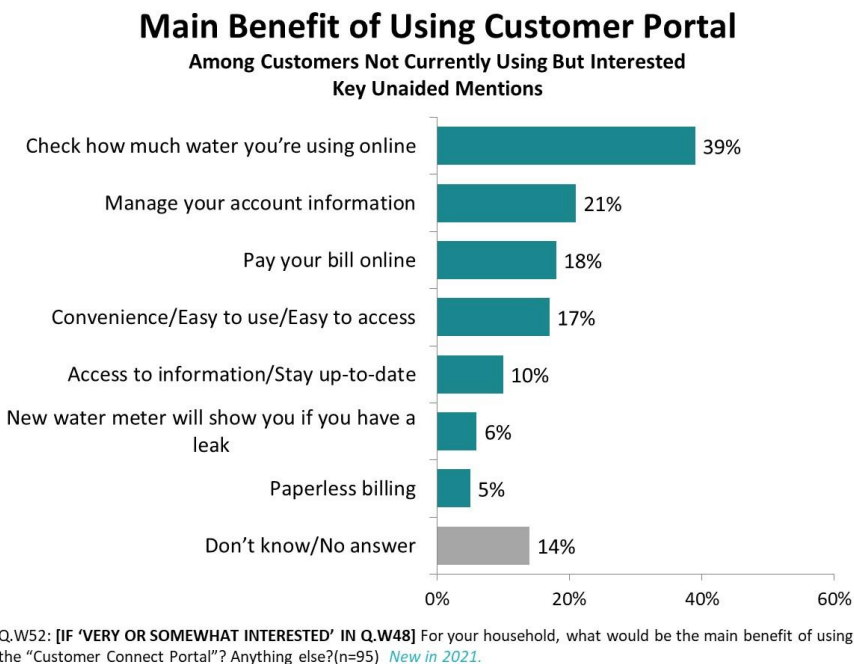
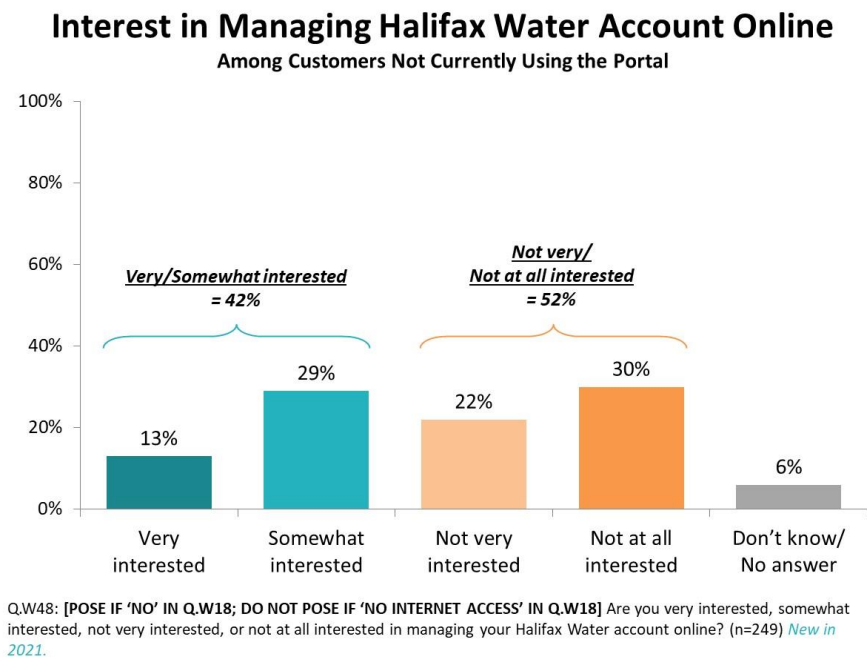
Among customers not using the portal already, few have information about it.

Among customers not using the portal, only 15 percent indicated they had heard or seen information related to the portal. (Table W47)

There is modest interest in using the Customer Connect Portal.

Among customers not using the portal, four in ten (42%) are either very interested or somewhat interested in using the portal to manage their Halifax Water account online. Interest is notably higher among younger residents. (Table W48)

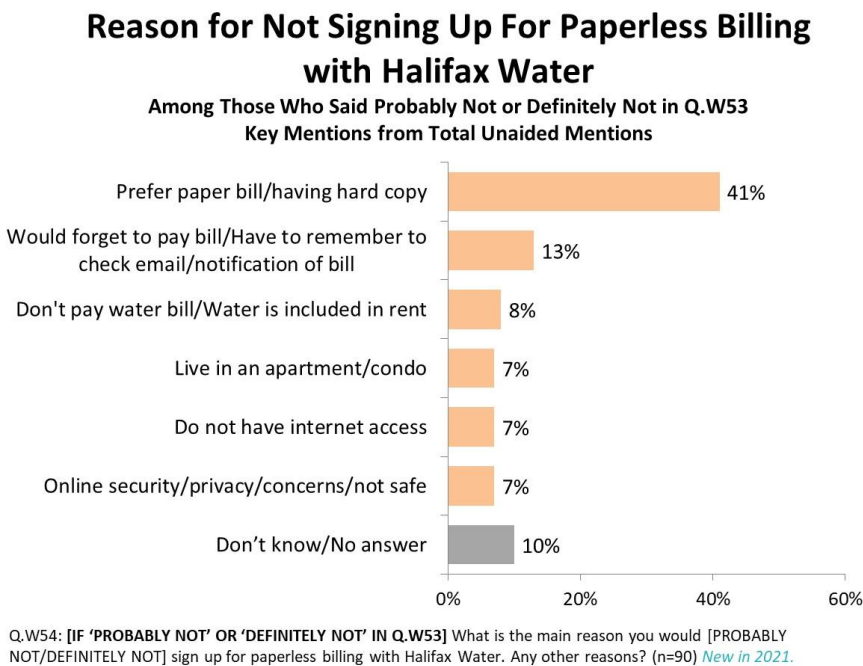
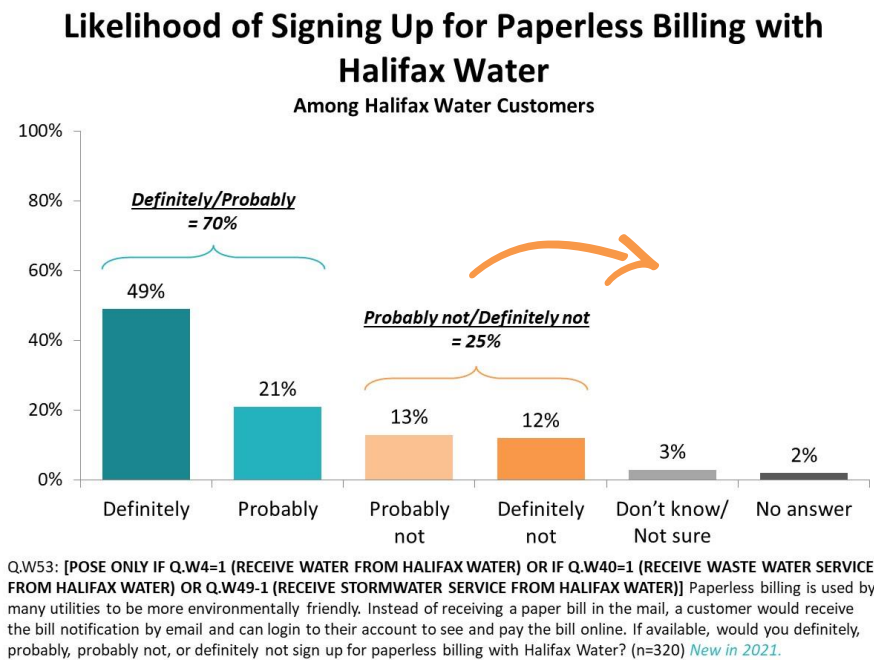
Among those very or somewhat interested, the primary benefit seen to using the portal is checking how much water they are using online (39%). Two in ten mention managing account information (21%), while just slightly fewer mention paying their bill online (18%) or convenience. (17%). (Table W52)



There is significant interest in paperless billing from Halifax Water, should it become available.

One-half (49%) of Halifax Water customers said they would definitely sign up for paperless billing from Halifax Water, while another two in ten (21%) said they would probably do so. Interest is higher among younger than older customers. (Table W53)

Among those who said they would probably not or definitely not sign up, the primary reason given was a preference for a hard copy (41%). A much less frequently mentioned reason is anticipating forgetting to pay the bill. (Table W54)



every insight tells a story.



TO: Becky Kent, B.A., Chair, and Members of the Halifax Regional Water Commission Board

SUBMITTED BY: Kenda
Signature
Digitally signed by Kenda
Signature
Date: 2022.03.16
16:02:41 -03'00'

Kenda MacKenzie, P.Eng., Director Regulatory Services

APPROVED: *Cathie O'Toole*
Digitally signed by Cathie
O'Toole
Date: 2022.03.16
14:23:46 -03'00'

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

DATE: March 10, 2022

SUBJECT: Climate Action Plan Update

INFORMATION REPORT

ORIGIN

Climate Action Plan introduction Halifax Water Environment and Safety Board Committee June 3, 2021.

BACKGROUND

There are two main approaches in addressing climate change:

- **Mitigation:** human intervention to reduce the sources or enhance the sinks of greenhouse gases
- **Adaptation:** an adjustment in natural or human systems in response to actual or expected climatic effects, which moderate harm, or takes advantage of beneficial opportunities.
With the main focus being:
 - alleviating current and projected future impacts;
 - reducing sensitivity and exposure to climate-related hazards;
 - increasing resiliency to climatic and non-climatic stressors.

The Enterprise Risk Management (ERM) has identified climate change as a significant risk to Halifax Water and Halifax Water has had three main programs in place to address the impacts from and to climate change.

- 1) Halifax Water established an Energy Management Committee to develop and implement mitigation activities and programs within the facilities to reduce energy use and overall energy footprint. The committee developed an Energy Management Plan that included:
 - Equipment and Infrastructure upgrades
 - Additions to Energy Management Information System to monitor outcomes
 - Develop plan for and manage Cogswell District Energy System (DES)
 - Energy efficiency measures – (i.e. new Burnside Depot, upgrades to Mill Cove Wastewater Treatment facility and Biosolids facility)
- 2) The IRP was updated in 2019 and identified Adaptation Programming including:
 - Dam vulnerability assessment (pilot)
 - Demand Side Management (DSM) initiatives
 - Design storm enhancements
 - Incorporated precipitation intensity and sea level rise scenarios
- 3) Oversight of Halifax Water’s environmental impact at facilities has been provided through the Environmental Management System (EMS). The EMS provides a structured tracking and reporting system to reduce the environmental impact through the development of:
 - Emergency Management Plan Updates

In addition to programs and projects undertaken by Halifax Water, there have been joint initiatives with HRM that have aspects that support our respective climate action goals.

- Integrated Stormwater Policy
- NDMP – flood resiliency
- HalifACT 2050

DISCUSSION

Halifax Water has been undertaking a number of activities that address climate change and decrease the impact the utility’s operations have on the environment through mitigation and adaptation programs and projects. The 20/21 Business Plan identified the need for Halifax Water is to develop an over-arching Climate Action Plan to align all of the initiatives and define targets.

During 2020/21 some progress was made toward achieving this business plan objective however the bulk of the work has carried forward to the 2022/23 business plan. In 2020/21 a Steering Committee was established to oversee the development and implementation of the Climate Action Plan for Halifax Water.

In February of 2021 the American Waterworks Association published a new best practice manual M71 – Climate Action Plans – Adaptive Management Strategies for Utilities. Halifax Water purchased copies of this manual and staff participated in educational workshops throughout the year to learn from utility industry best practice regarding development of Climate Action Plans.

Current activities and initiatives have been reviewed against the municipal objectives set in the HalifACT2050 plan. One such example of this during 2020/21 is consideration of the design of the new Burnside Operations depot relative to the goals set by the municipality for new municipal buildings.

In summary, activities in 2020/21 focused on research and setting up governance. Activities in 2022/23 will be development of the Climate Action Plan.

A Terms of Reference for the Steering Committee has been approved by the Executive and is attached (Appendix A). The committee is finalizing a request for proposal (RFP) to hire a consultant to develop the plan and framework to establish goals and centralized tracking. It is anticipated the RFP will be posted in May 2022, with a consultant in place by July 2022.

ATTACHMENT

Halifax Water Climate Resiliency Committee, Terms of Reference

Report Prepared by:

**Kenda
Signature**

Digitally signed by Kenda
Signature
Date: 2022.03.16
16:02:59 -03'00'

Kenda MacKenzie, P.Eng., Director Regulatory Services, 902-237-7116

ITEM #5-I

**Halifax Water Board
March 24, 2022
ATTACHMENT**

**Halifax Water
Climate Resiliency Committee
Terms of Reference**

1) Role

The role of the Climate Resiliency Committee (Committee) is to continue Halifax Water's commitment to creating and ensuring an ongoing focus on sustainability and energy efficiency throughout all operating areas while broadening its focus to include more emphasis on Greenhouse Gas (GHG) emission reduction, stormwater management and flood resiliency, climate vulnerability risk assessments and development of a Climate Action Plan (CAP) for Halifax Water with the intention of aligning with HalifACT 2050.

2) Composition and Operations

- a) The Committee will consist of voting members including the Director of Regulatory Services as Executive Lead; Manager, Energy, WWTF Engineering & Business Development; Enterprise Risk Management Program Manager; Asset Management Representative; Environmental Management System Program Manager; Stormwater Engineer; and, Administrative Assistant.
- b) The Committee Chair will be the Asset Management Representative.
- c) Quorum for meetings shall be three voting members.
- d) Members may attend meetings in person, via telephone, or virtually.
- e) The Committee shall meet at least four times per year. The Chair, in consultation with the Executive Lead, may cancel a meeting at their discretion.
- f) Additional members throughout the organization may be required for operational support of the Committee.
- g) The Administrative Assistant will act as the recording secretary.

3) Duties and Responsibilities

In fulfilling its role, the Committee shall:

- a) Act as subject matter experts providing guidance and oversight on the development and implementation of the Climate Action Plan (CAP).
- b) Ensure existing projects and programs are reflected in the CAP.
- c) Assist in setting priorities and tracking progress of implementation of the CAP.
- d) Act as CAP Champions within the organization. This means actively promoting, engaging, communicating and participating in the CAP.
- e) Ensure periodic progress reporting on the CAP.
- f) Develop reporting requirements to provide information to ESM (Environmental Management System), ERM (Enterprise Risk Management), and HalifACT.

4) Accountability

The Committee is accountable to the Long Range Planning Committee.

5) Review

The Committee shall review these terms of reference at least once annually and recommend any changes to the Long Range Planning Committee for approval.

6) Not Responsible (Out of Scope)

No out of scope items identified.

TO: Becky Kent, B.A., Chair, and Members of the Halifax Regional Water Commission Board

SUBMITTED BY: Susheel Arora
Digitally signed by Susheel Arora
Date: 2022.03.15 16:43:08 -03'00'
Susheel Arora, M.A.Sc., P.Eng. Director, Operations

APPROVED: Cathie O'Toole
Digitally signed by Cathie O'Toole
Date: 2022.03.15 16:29:13 -03'00'
Cathie O'Toole, MBA, FCPA, FCGA, ICD.D, General Manager

DATE: March 9, 2022

SUBJECT: Update on Wastewater Research Program - Dalhousie University

INFORMATION REPORT

ORIGIN

2018/2019 Memorandum of Understanding (MOU) between Dalhousie University and Halifax Water that directs research initiatives for the advancement of wastewater effluent quality for the protection of public health and the environment.

BACKGROUND

Halifax Water partnered with Dalhousie University through a Natural Science and Engineering Council of Canada (NSERC) Collaborative Research & Development (CRD) Grant, expanding Halifax Water's existing collaboration with Dalhousie University to strategically approach wastewater service and compliance challenges faced by Halifax Water. Considering the Wastewater System Effluent Regulations and the 2040 timeline for compliance, the research initiative is titled:

“Horizon 2040: Wastewater Treatment Innovation for Continuous Improvement of Effluent Quality”

The 2019 Compliance Plan and the 2019 Infrastructure Resource Plan provided an updated and more detailed plan to achieve compliance with future requirements in keeping with the WSER and to address some ongoing exceedances in order to meet current NSE regulations. It was identified that the three Harbour Solutions Treatment Facilities required short and long-term upgrades to meet these regulations. To further investigate the best way to achieve the effluent requirements,

it was determined that the first priority was to investigate optimization and process changes to existing infrastructure that could allow Halifax Water to consistently meet national effluent quality standards, and potentially avoid or mitigate the cost associated with extensive upgrades.

The current research plan is a three phased approach to improve effluent quality:

1. Bench, pilot, and full-scale optimization of coagulation/flocculation processes,
2. Application of innovative UV disinfection technology, and
3. Assessment of contaminants of emerging concern.

In addition, this partnership enhanced research capacity for wastewater treatment and analysis and will result in the training of highly qualified personnel in the wastewater sector, as well as a fully functioning wastewater research laboratory at Dalhousie University to provide robust capacity to emerging wastewater challenges.

This report and the attached presentation provides an overview of the progress made to date for the various projects outlined in the awarded NSERC CRD grant (e.g. optimization of coagulation/flocculation processes, application of innovative UV disinfection technology, assessment of contaminants of emerging concern), as well as for the SARS-CoV-2 wastewater research and the additional projects that have been established as result of the partnership between Halifax Water and Dalhousie University.

DISCUSSION

The attached presentation highlights the work completed to date and outlines future activities. Generally, the tasks identified in the research program endorsed by NSERC and Halifax Water are on schedule. Public health restrictions related to Covid-19 in 2021/22 were challenging, but a significant amount of work was accomplished that directly led to changes in the full scale treatment facilities. The project is under budget at this time however, we believe that Dalhousie University is adequately resourced to meet all objectives of the project and leverage all approved funding from NSERC and Halifax Water over this coming year. A significant investment in the purchase of the pilot plant will occur in Q1 of 2022/23.

In October 2021; Dalhousie University, in collaboration with Halifax Water and other industry partners, submitted a grant application under the Alliance Grants program of NSERC to continue the research partnership. This application is entitled, “Partnership for Innovation in Climate Change Adaptation in Water & Wastewater Treatment”. This five year research program is organized into following three themes of research:

- A. Development of Robust Monitoring Methods & Technologies
- B. Climate-Adaptive Technologies for Safe Water at the Tap; and
- C. Climate Conscious Technologies for Wastewater Management

This initiative is supportive of Halifax Water’s “One Water” approach and is designed as such with the leading industry practice.

ATTACHMENT

Progress Research Update – Horizon 2040: Wastewater Treatment Innovation for Continuous Improvement of Effluent Quality

Report Prepared by: ***Original signed by:*** _____

Chris Fahie, P.Eng.

Manager of Wastewater Quality, Phone: 902-802-9732



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1

Bench Scale - Chemically Enhanced Primary Treatment Optimization @ HHSPs

Students from Dalhousie University and HW staff have conducted over 200 bench-scale jar tests since Fall 2020 to identify optimal conditions for improving effluent standards related to permit requirements (BOD and TSS) and determine what chemistry is required to achieve optimal removal efficiencies at the Dartmouth WWTF.

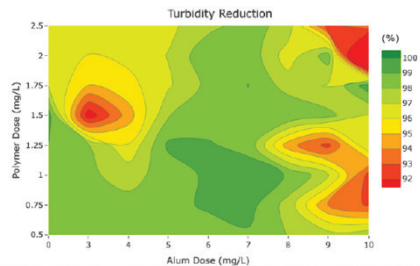


Figure 1. Contour plot showing % reduction from influent turbidity as a function of alum and polymer dose, determined through jar testing.

Findings

Ideal ranges were determined to be 5 to 7 mg/L for alum and 1 to 1.5 mg/L for polymer.
Implemented these changes full scale – Observed increased compliance

2

Pilot Scale - Optimization @ DWWTF

A pilot scale ballasted clarification system was tested at the Dartmouth WWTF in the Summer/Fall of 2020 in order to evaluate the performance of an alternative ballasted flocculation system in parallel to the current primary treatment system.

Focus of study was identified in the Compliance Plan

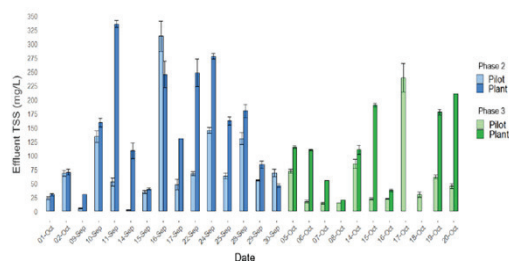


Figure 2. Average effluent TSS of pilot (light shade) and plant (dark shade) where blue bars represent Phase 2 and green bars represent Phase 3.

Preliminary Findings

System outperformed existing technology
Faster recovery from wet weather events

3

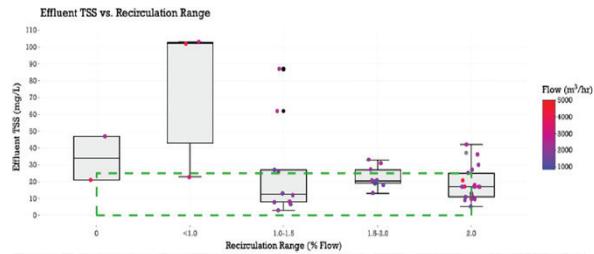
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Full Scale - Optimization @ DWWTF

Optimized ballasted clarification in the full-scale Densadeg units.

- 1) analyzing historical operational data (e.g., Densadeg Check Sheets) and water quality data to identify patterns in operations such as sludge recirculation and impact on clarifier performance, and 2) determining ideal operational ranges for chemical dosing and sludge recirculation rates under variable influent conditions.



Findings

Increasing the recirculation from 1 to 3% (of influent flow rate) improved clarifier performance.

Maintain solids concentration of between 800-1000 mg/L (10 to 20%) in the flocculators.

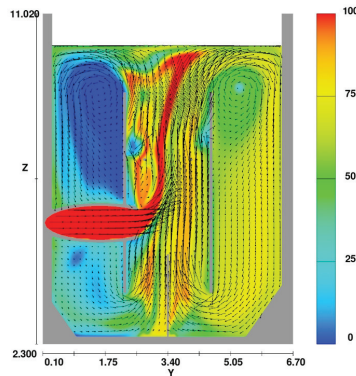
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Computer Modeling – Process Flocculation

Polymer and Sludge Recirculation Modeling of Piston Reactors using Computational Fluid Dynamic Modeling

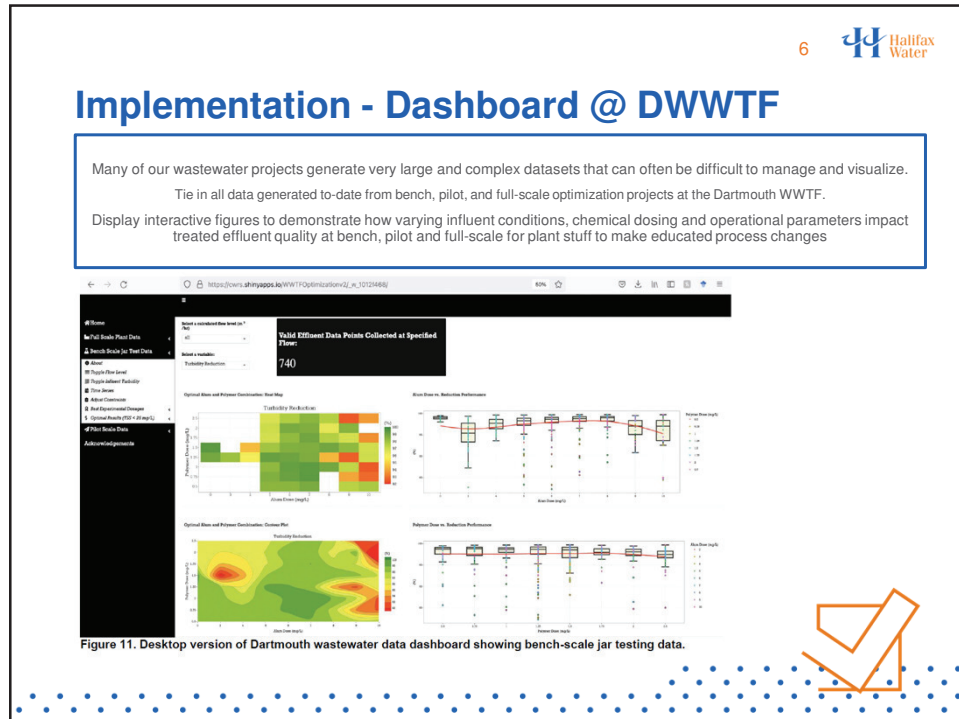


Findings

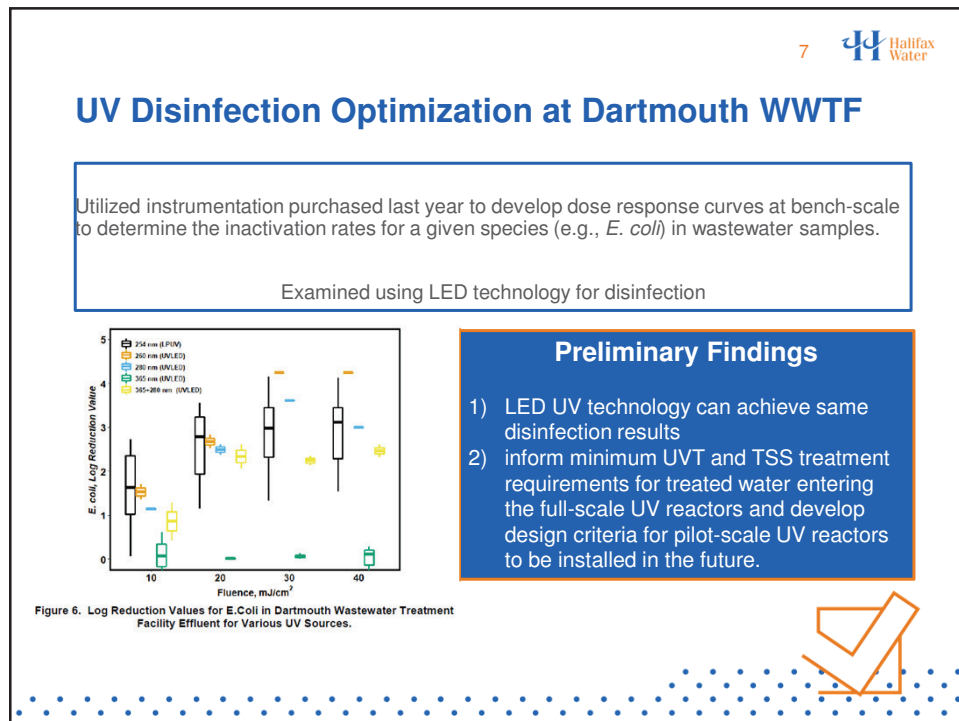
Unfavorable hydraulic mixing in existing configuration

Engineered solution under investigation to remediate design issues

5



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Contaminants of Emerging Concern

Developing methods to detect microplastics and nanoplastics in wastewater which will be used to establish treatment approaches and to remove these contaminants of emerging concern to our environment.

A multiangle light scattering system (MALS) is the key analytical equipment for this research program, which has been installed at Dalhousie in February 2021.


Dr. Evelyne Dore (Post Doctoral Fellow) and Heather Daurie (CWRS Lab Manager) have been trained on the equipment and are in the process of developing methods for plastics analysis.

developed methods and standard operating procedures





8

9 

Additional Research – SARS-CoV2


Environmental surveillance of SARS-CoV-2 in wastewater has the potential to support understanding of COVID-19 occurrence and transmission in communities. As such, wastewater may be monitored for SARS-CoV-2 to determine the prevalence of COVID-19 infections in a given population through wastewater-based epidemiology.

Nova Scotia Health Authority and communication of data to the Nova Scotia Health Authority for public health decision making such as identification of extent of infection in Nova Scotia, early identification of subsequent waves of the virus and informing the safe lifting of social and economic restrictions.

Over 200 samples (consisting of wastewater and biosolids from Halifax Water and other partners) have been received and analyzed by Dalhousie staff

Preliminary Findings

- 1) Gather baseline data to establish dynamics of SARS-CoV-2 prevalence that may result from travel from outside Nova Scotia
- 2) Aid in making public health decisions related to identifying the extent of inflection in NS, early detection and safety protocols on social and economic restrictions



9

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Additional Research – Bioaugmentation

Dosing microorganisms in strategic locations in the Timberlea Sewershed.

Goal of causing the network to act as a bioreactor and as a result the wastewater is treated prior to entering the treatment facility itself.

This technology could help Halifax Water in meeting national effluent quality standards, and potentially avoid the cost associated with extensive upgrades.

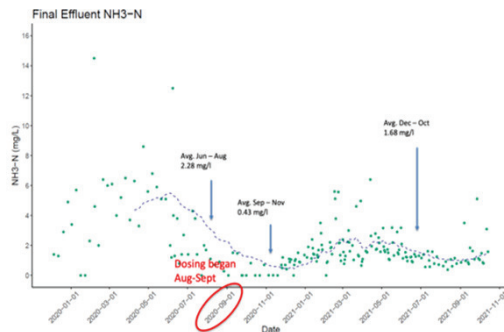


Figure 4. Decreases in effluent ammonia concentration since bioaugmentation dosing began in late Summer 2021.

Findings

Reduction in in effluent ammonia below the current discharge limits (Figure 4) of 3 mg/L in Summer/fall and 5 mg/L in winter/spring, as well as improvements in the treatment process.

Compliance Achieved



10

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Future Activities 2022/2023

- Continue full scale investigations
- RFQ recently advertised to provide large-scale pilot to be built at DWWTF – Select preferred proponent and implement Q2
- Fabricate and commission pilot facility at DWWTF to direct studies on UV, microplastics, chemical optimization etc.
- Dalhousie and Halifax Water collaboration continues; pending results of the Research Alliance grant application. This 5 year research plan will focus on improving water and wastewater quality under climate change pressures through advancing science and technology.



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