902-420-9287
450 Cowie Hill Road
P.O. Box 8388 RPO CSC
Halifax, Nova Scotia
Canada B3K 5M1

September 28, 2023

The regular meeting of the Halifax Water Board will be held virtually on Thursday, September 28, 2023, 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, June 22, 2023 (2 minutes)

***Motion**: That the Halifax Water Board approve the In-Camera minutes of June 22, 2023.*

2C Business Arising from Minutes (5 minutes)
a)

3C Security Matter (15 minutes)

4C Legal Matter (5 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, June 22, 2023 (2 minutes)

***Motion**: That the Halifax Water Board approve the minutes of the June 22, 2023, regular meeting.*

3. Business arising from minutes
   a) Capital Project Dashboard (5 minutes)

Financial Reports

4.1 Operating results as at July 31, 2023, and year-end projection (15 minutes)

4.2 Capital expenditures as at July 31, 2023, and year-end projection (10 minutes)

4.3 Fall 2023 Debenture (10 minutes)

***Motion**: That the Halifax Water Board approve:*

1. *the financing of $39,988,188 with a thirty-year amortization term and finance over ten years, with an all-inclusive rate not to exceed 6.5%.*
2. *the re-financing of $10,472,225 with a ten-year amortization term and financing over ten years, with an all-inclusive rate not to exceed 6.5%.*

4.4 Auditor Appointment (5 minutes)

***Motion**: That the Halifax Water Board appoint Grant Thornton LLP as auditors for the Halifax Regional Water Commission financial statements for the year ended March 31, 2024, and the Halifax Regional Water Commission Employees' Pension Plan for the year ended December 31, 2023.*

Other Business

5. July 21, 2023, Flooding Event Update (20 minutes)

Nova Scotia Utility & Review Board

6. Capital Project Spending Summary 2022/23

***Motion**: That the Halifax Water Board approve for filing with the Nova Scotia Utility and Review Board the capital project spending summary for the period April 1, 2022, to March 31, 2023, and the capital project spending over $1,000,000 summary for the period April 1, 2022, to March 31, 2023.*

Information Reports	
1-I	Operational Performance Information Report
2-I	Halifax Water Compliance Statement – Quarterly Certification
3-I	Halifax Water 2022/2023 Annual Report
4-I	Halifax Water Employees' Pension Plan Performance – Quarterly Update
5-I	Nova Scotia Utility and Review Board Annual September Filings

Heidi Schedler, KC
Secretary

ITEM # 4.1
Halifax Water Board

September 28, 2023

TO: Colleen Rollings, P.Eng., PMP., Chair and Members of the Halifax Regional Water Commission Board

SUBMITTED BY: Louis de Montbrun (Sep 21, 2023 16:28 ADT)
Louis de Montbrun, CPA, CA, Director, Corporate Services/CFO

APPROVED: Tareq Al-Zabet (Sep 22, 2023 13:48 ADT)
Tareq Al-Zabet, Ph.D., CRSP, P.Geo, CEO & General Manager

DATE: September 8, 2023

SUBJECT: Financial Results for the four months ended July 31, 2023

ORIGIN

Financial information reporting.

BACKGROUND

At the September 8, 2023 meeting of the Halifax Water Audit and Finance Committee, the attached report was reviewed.

DISCUSSION

At the Audit and Finance Committee meeting, the attached were presented financial information for the four months ended July 31, 2023 was reviewed and discussed.

ATTACHMENTS

1. Report to the Halifax Water Audit and Finance Committee re. financial results of the Halifax Regional Water Commission for the four months ended July 31, 2023

Report prepared by:

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

ITEM # 3

Halifax Water Audit and Finance Committee

September 08, 2023

TO: Chair and Members of the Halifax Regional Water Commission Audit and Finance Committee

SUBMITTED BY: A. Scallion on behalf of Louis de Montbrun
Digitally signed by A. Scallion on behalf of Louis de Montbrun
Date: 2023.09.01 13:11:16 -03'00'

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

APPROVED: Tareq Al-Zabet
Digitally signed by Tareq Al-Zabet
Date: 2023.09.01 13:21:55 -03'00'

Tareq Al-Zabet, Ph.D., CRSP, P. Geo
Chief Executive Officer and General Manager

DATE: August 24, 2023

SUBJECT: Financial Results for the four months ended July 31, 2023

ORIGIN

Financial information reporting.

DISCUSSION

Attached are the operating results for Halifax Water for the four months year ended July 31, 2023, with comparative figures for July 31, 2022.

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) – Page 3 of Attachment 1

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

Table 1: Assets

July 31 (in thousands)	Notes	2023	2022	March 31 2023	From Prior Year $ Change	From Prior Year % Change
Assets						
Current						
Cash and cash equivalents	**A**	$ 30,195	$ 69,465	$ 44,596	$ (39,270)	(56.5%)
Receivables						
Customer charges and contractual	**B**	21,139	16,419	17,825	4,720	28.7%
Unbilled service revenues	**C**	21,406	20,706	19,265	700	3.4%
Halifax Regional Municipality	**D**	7,256	10,949	11,305	(3,693)	(33.7%)
Inventory		2,266	2,174	3,517	92	4.2%
Prepaids	**E**	1,040	2,200	1,282	(1,160)	(52.7%)
		83,302	121,913	97,790	(38,611)	(31.7%)
Capital work in progress	**F**	100,273	69,823	79,447	30,450	43.6%
Utility plant in service	**G**	1,312,021	1,317,786	1,363,810	(5,765)	(0.4%)
Total assets		1,495,596	1,509,522	1,541,047	(13,926)	(0.9%)
Regulatory deferral account		2,173	2,365	2,237	(192)	(8.1%)
Total assets and regulatory deferral account		**$ 1,497,769**	**$ 1,511,887**	**$ 1,543,284**	**$ (14,118)**	**(0.9%)**

Notes related to Table 1:

A) *Cash and cash equivalents* have decreased $39.3 million from the prior year due to increases in the payments related to an increased capital budget and repayment of long-term debt of $15.4 million in May 2023. The total balance of the Regional Development Charge (RDC) reserves is $97.9 million.

B) *Customer charges and contractual receivables* have increased $4.7 million from the prior year. The change in receivables is driven by the timing of billing cycles, higher service rates due to rate increases and receivables for stormwater right of way charges for customers in expanded service area and the province.

Customer charges and contractual	2023/24 '000	2022/23 '000	$ Change	% Change
Trade receivables	**$ 20,803**	$ 16,736	$ 4,067	24.3%
Other receivables	**3,147**	2,868	279	9.7%
Allowance for doubtful accounts	**(2,811)**	(3,185)	374	11.7%
	$ 21,139	$ 16,419	$ 4,720	28.7%

C) *Unbilled service revenues* have increased $0.7 million due to the timing of billing cycles and the increases in rates for services.

D) *Halifax Regional Municipality receivable* has decreased from the prior year by $3.7 million. The decrease is primarily related to timing of the invoicing for annual fire protection and Stormwater Right of Way which were invoiced in July in the prior year but were not invoiced until August in the current year. The increase in RDC is related to development activity within Halifax and an increase in RDC rates on April 1 by CPI.

HRM Receivables and Payables				
	2023/24	2022/23		
	'000	'000	$ Change	% Change
Receivables	**$ 6,980**	$ 11,776	$ (4,796)	(40.7%)
RDC	**5,481**	3,268	2,213	67.7%
Payables	**(5,205)**	(4,095)	(1,110)	27.1%
	$ 7,256	$ 10,949	$ (3,693)	(33.7%)

E) The decrease in *prepaids* of $1.2 million is due in part to several licensing invoices being paid and/or ending and the timing of invoicing in the current year not yet received.

F) The $30.5 million increase in *capital work in progress* relates to expenditures during the year of $101.1 million compared to $70.8 million in prior year.

G) The $5.8 million decrease in *utility plant in service* relates to depreciation expense.

Table 2: Liabilities and Equity

July 31 (in thousands)	Notes	2023	2022	March 31 2023	From Prior Year $ Change	From Prior Year % Change
Liabilities						
Current						
Payables and accruals						
Trade	A	20,901	18,254	33,827	2,647	14.5%
Non-trade		4,324	3,886	4,717	438	11.3%
Interest on long term debt		1,600	1,678	2,205	(78)	(4.6%)
Contractor and customer deposits		3,308	2,941	2,841	367	12.5%
Current portion of long term debt		45,962	46,272	45,962	(310)	(0.7%)
Unearned revenue	B	75	7,394	95	(7,319)	(99.0%)
		76,170	80,425	89,647	(4,255)	(5.3%)
Long term debt	C	164,743	187,107	172,489	(22,364)	(12.0%)
Deferred contributions	D	100,996	76,917	94,210	24,079	31.3%
Total liabilities		341,909	344,449	356,346	(2,540)	(0.7%)
Equity						
Accumulated capital surplus		1,128,088	1,127,044	1,153,390	1,044	0.1%
Accumulated operating surplus		12,168	29,123	28,925	(16,955)	(58.2%)
Operating surplus used to fund capital		12,380	12,380	12,380	0	0.0%
Deficiency of revenues over expenditures		3,224	(1,109)	(7,757)	4,333	(390.7%)
Total equity		1,155,860	1,167,438	1,186,938	(11,578)	(1.0%)
Total liabilities and equity		**$ 1,497,769**	**$ 1,511,887**	**$ 1,543,284**	**$ (14,118)**	**(0.9%)**

Notes related to Table 2:

A) *Trade payables and accruals* have increased $2.6 million from the prior year. Trade accrued payables increased $3.2 million relating to accruals for capital projects for which invoices were not received as of year-end.

Payables and Accruals	2023/24 '000	2022/23 '000	$ Change	% Change
Trade payables	**$ 9,770**	$ 10,229	$ (459)	(4.5%)
Trade accrued payables	**10,612**	7,386	3,226	43.7%
Accrued wastewater rebate	**519**	639	(120)	(18.8%)
	$ 20,901	$ 18,254	$ 2,647	14.5%

B) *Unearned revenue* has decreased $7.3 million due to timing of the invoicing for annual fire protection and Stormwater Right of Way which were invoiced in July in the prior year but were not invoiced until August in the current year.

C) *Long term debt* and the *current portion of long term debt* have decreased $22.4 million due to less new debt acquired during the fiscal year of $13.7 million compared to the prior year of $32.9 million.

D) *Deferred contributions* have increased $24.1 million from the prior year mainly due to the increase in RDC receipts.

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 of July 31, 2023, is as follows:

Debt Servicing Ratio by Service		
	2023/24	2022/23
Water	**12.81%**	14.55%
Wastewater	**19.14%**	23.14%
Stormwater	**20.24%**	24.18%
Combined	**16.84%**	19.92%

The debt servicing ratio for each service has decreased from the prior year. Debt servicing ratios have decreased from the prior year due to higher revenues, and lower debt overall, than the prior year as a result of increases to rates.

The combined debt servicing ratio of 16.84% is below the maximum 35.00% ratio allowed under the blanket guarantee agreement with Halifax.

Statement of Earnings (NSUARB) – Page 4 of Attachment 1

Table 3: Summarized Statement of Earnings (NSUARB)

Summarized Statement of Earnings								
		Budget	Actual	Actual	From Prior Year		Actual to Budget	
	Notes	**2023/24**	2023/24	2022/23				
		'000	'000	'000	$ Change	% Change	$ Change	% Change
Operating revenues		**$ 168,897**	$ 57,340	$ 51,528	$ 5,812	11.28%	$ (111,557)	(66.05%)
Operating expenditures		**135,956**	41,986	40,453	1,533	3.79%	(93,970)	(69.12%)
Earnings from operations before financial and other revenues and expenditures		**32,941**	15,354	11,075	4,279	38.64%	(17,587)	(53.39%)
Financial and other revenues		**951**	269	280	(11)	(3.93%)	(682)	(71.71%)
Financial and other expenditures		**36,208**	12,399	12,464	(65)	(0.52%)	(23,809)	(65.76%)
Earnings (loss) for the year	**A**	**$ (2,316)**	$ 3,224	$ (1,109)	$ 4,333	(390.71%)	$ 5,540	(239.21%)

Notes related to Table 3:

A) The *earnings* for the year are $3.2 million, an increase of $4.3 million over the prior year loss. The following is a discussion of factors influencing the change.

Table 4: Operating Revenues:

Operating Revenues	Notes	Budget 2023/24 '000	Actual 2023/24 '000	Actual 2022/23 '000	From Prior Year $ Change	From Prior Year % Change	Actual to Budget $ Change	Actual to Budget % Change
Consumption revenue	B	$ 108,489	$ 37,033	$ 32,625	$ 4,408	13.51%	$ (71,456)	(65.86%)
Base charge revenue		34,356	11,566	11,514	52	0.45%	(22,790)	(66.33%)
Wastewater rebate		(1,621)	(573)	(498)	(75)	15.06%	1,048	(64.65%)
Metered sales total		141,224	48,026	43,641	4,385	10.05%	(93,198)	(65.99%)
Stormwater site generated charge	C	8,873	3,020	2,297	723	31.48%	(5,853)	(65.96%)
Stormwater right of way	D	6,515	2,172	1,534	638	41.59%	(4,343)	(66.66%)
Public fire protection		8,083	2,694	2,636	58	2.20%	(5,389)	(66.67%)
Private fire protection		1,652	555	451	104	23.06%	(1,097)	(66.40%)
Other operating revenue		2,550	873	969	(96)	(9.91%)	(1,677)	(65.76%)
Operating revenue total	A	$ 168,897	$ 57,340	$ 51,528	$ 5,812	11.28%	$ (111,557)	(66.05%)

Notes related to Table 4:

Operating revenues are presented above, broken down by type:

A) *Operating revenues* have increased $5.8 million as compared to the previous year.

B) *Consumption revenue* has increased $4.4 million over the prior year due in part to rate increases for water consumption and wastewater discharge effective December 1, 2022 and April 1, 2023. Water rates increased from $0.976 per cubic meter in the prior year to $1.017 per cubic meter effective December 1, 2022 and to $1.128 per cubic meter effective April 1, 2023. Wastewater rates increased from $2.073 per cubic meter in the prior year to $2.189 per cubic meter effective December 1, 2022 and to $2.259 per cubic meter effective April 1, 2023.

C) *Stormwater site generated charge* revenue is $0.7 million more than the prior year due to rate increases effective December 1, 2022 and April 1, 2023 along with the addition of new customers due to the expansion of the stormwater boundary effective June 1, 2022.

D) *Stormwater right of way charge revenue* has increased $0.6 million from the prior year due to addition of Province of Nova Scotia and Bridge Commission with an effective date of December 1, 2022.

Table 5: Operating expenditures:

Operating Expenditures	Notes	Budget 2023/24 '000	Forecast 2023/24 '000	Actual 2023/24 '000	Actual 2022/23 '000	From Prior Year $ Change	From Prior Year % Change
Water supply and treatment	B	**$ 12,621**	**$ 12,621**	$ 3,919	$ 3,548	$ 371	10.46%
Water transmission and distribution	C	**13,203**	**13,203**	4,098	3,921	177	4.51%
Wastewater collection	D	**13,554**	**13,554**	4,280	4,128	152	3.68%
Stormwater collection	E	**5,382**	**5,382**	1,598	1,392	206	14.80%
Wastewater treatment	F	**25,065**	**25,065**	7,156	7,279	(123)	(1.69%)
Engineering and technology services	G	**14,009**	**14,009**	4,642	4,425	217	4.90%
Regulatory services	H	**5,060**	**5,060**	1,539	1,452	87	5.99%
Customer services	I	**4,526**	**4,526**	1,378	1,481	(103)	(6.95%)
Corporate services	J	**3,655**	**3,655**	1,105	959	146	15.22%
Administration services	J	**6,197**	**6,197**	1,679	1,750	(71)	(4.06%)
Depreciation and amortization	K	**32,684**	**32,684**	10,592	10,118	474	4.68%
Total operating expenditures	A	**$ 135,956**	**$ 135,956**	$41,986	$40,453	$ 1,533	3.79%

Notes related to Table 5:

A) *Operating expenditures* of $42.0 million are $1.5 million higher than the prior year.

B) *Water supply and treatment* expenditures have increased $0.4 million from prior year due to an increase in salaries and benefits, consulting services, and materials and supplies resulting from service continuity during statement of emergency.

C) *Water transmission and distribution* expenditures are comparable to prior year.

D) *Wastewater collection* expenditures are comparable to prior year.

E) *Stormwater collection* expenditures have increased $0.2M due to an increase in contract services and traffic services resulting from increased usage to repair damage from storm and flood damage.

F) *Wastewater treatment* expenditures are comparable to prior year.

G) *Engineering and technology services* expenditures are $0.2M higher then prior year due to a change in the allocation of expenses between corporate services and engineering and technology services from previous year.

H) *Regulatory Services* expenditures are comparable to prior year.

I) *Customer services* expenditures are comparable to prior year.

J) *Corporate services and administration services* expenditures are comparable to prior year

K) *Depreciation and amortization* have increased $0.4 million as a result of additions to utility plant in service and intangibles.

Table 6: Financial and other revenues:

Financial and other revenues								
		Budget	Actual	Actual	From Prior Year		Actual to Budget	
	Notes	2023/24 '000	2023/24 '000	2022/23 '000	$ Change	% Change	$ Remaining	% Remaining
Interest		$ 324	$ 80	$ 105	$ (25)	(23.81%)	$ (244)	(75.31%)
Other		627	189	175	14	8.00%	(438)	(69.86%)
Total financial and other revenues	A	$ 951	$ 269	$ 280	$ (11)	(3.93%)	$ (682)	(71.71%)

Notes related to Table 6:

A) *Financial and other revenues* have not significantly changed from the prior year.

Table 7: Financial and other expenditures:

Financial and other expenditures								
		Budget	Actual	Actual	From Prior Year		Actual to Budget	
	Notes	2023/24 '000	2023/24 '000	2022/23 '000	$ Change	% Change	$ Remaining	% Remaining
Interest on long term debt		$ 7,051	$ 2,351	$ 2,460	$ (109)	(4.43%)	$ (4,700)	(66.66%)
Amortization of debt discount		202	72	82	(10)	(12.20%)	(130)	(64.36%)
Repayment on long term debt		22,191	7,235	7,724	(489)	(6.33%)	(14,956)	(67.40%)
Dividend/grant in lieu of taxes		6,589	2,708	2,155	553	25.66%	(3,881)	(58.90%)
Other		175	33	43	(10)	(23.26%)	(142)	(81.14%)
Total financial and other expenditures	A	$ 36,208	$ 12,399	$ 12,464	$ (65)	(0.52%)	$ (23,809)	(65.76%)

Notes related to Table 7:

A) *Financial and other expenditures* have remained similar to the prior year. There was a decrease of $0.5 million in principal payments on long-term debt due to an error in the prior year accrual corrected in a subsequent period, offset by an increase of $0.6 million in the dividend/grant in lieu of taxes due to a higher payment approved for fiscal 2023/24.

Table 8: Operating Results by Service:

Operating Results by Service	Budget 2023/24 '000	Actual 2023/24 '000	Actual 2022/23 '000	From Prior Year $ Change	From Prior Year % Change	Actual to Budget $ Remaining	Actual to Budget % Remaining
Water	**$ (1,715)**	$ (13)	$ (242)	$ 229	(94.63%)	$ 1,702	(99.24%)
Wastewater	**70**	2,884	(436)	3,320	(761.47%)	2,814	4020.00%
Stormwater	**(671)**	353	(431)	784	(181.90%)	1,024	(152.61%)
Loss (earnings)	**$ (2,316)**	$ 3,224	$ (1,109)	$ 4,333	(390.71%)	5,540	(239.21%)

The results in Table 10 are explained in more detail in Tables 11 to 13.

Table 9: Operating Results by Service – Water:

Operating Results by Service - Water	Notes	Budget 2023/24 '000	Actual 2023/24 '000	Actual 2022/23 '000	From Prior Year $ Change	From Prior Year % Change	Actual to Budget $ Remaining	Actual to Budget % Remaining
Operating revenues	**A**	**$ 64,252**	$ 21,706	$ 19,788	$ 1,918	9.69%	$ (42,546)	(66.22%)
Operating expenditures	**B**	**51,974**	16,814	15,485	1,329	8.58%	(35,160)	(67.65%)
Earnings from operations		**12,278**	4,892	4,303	589	13.69%	(7,386)	(60.16%)
Financial and other revenues		**724**	233	226	7	3.10%	(491)	(67.82%)
Financial and other expenditures		**14,717**	5,138	4,771	367	7.69%	(9,579)	(65.09%)
Loss for the year		**$ (1,715)**	$ (13)	$ (242)	$ 229	(94.63%)	$ 1,702	(99.24%)

Water services loss has improved from the prior year loss by $0.2 million due to the following factors:

A) *Operating revenues* increase of $1.9 million attributable to the following:

   i. Increase in base charges and consumption by new and existing customers.

   ii. Water rates increased from $0.976 per cubic meter to $1.017 per cubic meter effective December 1, 2022 and to $1.128 per cubic meter effective April 1, 2023.

B) Increase in *operating expenditures* of $1.3 million. There was a $0.4 million increase in Water supply and treatment due to increase in salaries and benefits, consulting services, and materials and supplies resulting from service continuity during statement of emergency. There was also a $0.3 million increase in Engineering and Technology services due to a change in the allocation of costs between services resulting from the re-organization of the department.

Table 10: Operating Results by Service – Wastewater:

Operating Results by Service - Wastewater	Notes	Budget 2023/24 '000	Actual 2023/24 '000	Actual 2022/23 '000	From Prior Year $ Change	From Prior Year % Change	Actual to Budget $ Remaining	Actual to Budget % Remaining
Operating revenues	A	$ 89,041	$ 30,396	$ 27,786	$ 2,610	9.39%	$ (58,645)	(65.86%)
Operating expenditures		71,132	21,431	21,597	(166)	(0.77%)	(49,701)	(69.87%)
Earnings (loss) from operations		17,909	8,965	6,189	2,776	44.85%	(8,944)	(49.94%)
Financial and other revenues		266	63	67	(4)	(5.97%)	(203)	(76.32%)
Financial and other expenditures	B	18,105	6,144	6,692	(548)	(8.19%)	(11,961)	(66.06%)
Earnings (loss) for the year		$ 70	$ 2,884	$ (436)	$ 3,320	(761.47%)	$ 2,814	4020.00%

Wastewater services earnings of $2.9 million is higher than the prior year loss by $3.3 million due to the following factors:

A) *Operating revenues* increase of $2.6 million is attributable primarily to the increase in the wastewater discharge rate from $2.073 per cubic meter to $2.189 per cubic meter effective December 1, 2022 and to $2.259 per cubic meter effective April 1, 2023.

B) Decrease in *financial and other expenditures* of $0.5 million due to an error in the prior year accrual for principal payments on long-term debt which was corrected in a subsequent period.

Table 11: Operating Results by Service – Stormwater:

Operating Results by Service - Stormwater	Notes	Budget 2023/24 '000	Actual 2023/24 '000	Actual 2022/23 '000	From Prior Year $ Change	From Prior Year % Change	Actual to Budget $ Remaining	Actual to Budget % Remaining
Operating revenues	A	$ 15,604	$ 5,238	$ 3,954	$ 1,284	32.47%	$ (10,366)	(66.43%)
Operating expenditures	B	12,850	3,741	3,371	370	10.98%	(9,109)	(70.89%)
Loss from operations		2,754	1,497	583	914	156.78%	(1,257)	(45.64%)
Financial and other revenues		(39)	(27)	(13)	(14)	107.69%	12	(30.77%)
Financial and other expenditures		3,386	1,117	1,001	116	11.59%	(2,269)	(67.01%)
Loss (earnings) for the year		$ (671)	$ 353	$ (431)	$ 784	(181.90%)	$ 1,024	(152.61%)

Stormwater services earnings of $0.4 million is $0.8 million higher than the prior year earnings. The following factors influenced the results:

A) Increase of $1.3 million in *operating revenues* due to rate increases effective December 1, 2022 and April 1, 2023 along with the addition of new customers due to the expansion of the stormwater boundary effective June 1, 2022.

B) Increase in *operating expenditures* of $0.4 million. There was a $0.2 million increase in Stormwater collection due to increases in contract services and traffic services resulting from increased usage to repair damage from storm and flood damage. There was also a $0.2 million increase in Regulatory compliance services due to a change in the allocation of costs between services resulting from the re-organization of the department.

Table 12: Operating Results by Activity:

Operating Results by Activity								
		Budget	Actual	Actual	From Prior Year		Actual to Budget	
	Notes	2023/24 '000	2023/24 '000	2022/23 '000	$ Change	% Change	$ Remaining	% Remaining
Regulated activities	A	$ (2,727)	$ 2,868	$ (1,459)	$ 4,327	(296.57%)	$ 5,595	(205.17%)
Unregulated activities	B	411	356	350	6	1.71%	(55)	(13.38%)
Loss (earnings) for the year		$ (2,316)	$ 3,224	$ (1,109)	$ 4,333	(390.71%)	$ 5,540	(239.21%)

Notes related to Table 12:

A) *Regulated activities* earnings has increased from the prior year loss by $4.3 million due to the factors as previously explained including net of increases in revenues and expenditures.

B) *Unregulated activities* earnings of $0.4 million have remained consistent with the prior year.

Results under NSUARB Handbook as compared to International Financial Reporting Standards

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 9 below reconciles the results between IFRS and the NSUARB Handbook.

Table 13: Reconciliation IFRS to NSUARB:

Reconcile IFRS to NSUARB			
	Notes	2023/24 '000	2022/23 '000
IFRS comprehensive earnings		$ 6,550	$ 3,011
Add non-cash pension expense	A	3,138	3,138
Subtract debt principal payments	B	(7,235)	(7,724)
Add depreciation expense on contributed assets	C	18,793	18,592
Subtract amortization of contributed capital	C	(18,793)	(18,592)
Add various depreciation adjustments	D	772	464
NSUARB Earnings (loss)		$ 3,224	$ (1,109)

Notes related to Table 13:

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 for water and wastewater assets, however, it is offset by the removal of the amortization of contributed capital. For stormwater assets, 25% of depreciation on contributed assets is included for NSUARB reporting purposes. 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 14: Statement of Earnings and Comprehensive Earnings (IFRS):

Summarized Comprehensive Earnings					
	Notes	**2023/24 '000**	2022/23 '000	$ Change	% Change
Operating revenues	**A**	**$ 57,338**	$ 51,528	$ 5,810	11.3%
Operating expenditures	**B**	**51,814**	50,108	1,706	3.4%
Earnings from operations before financial and other revenues and expenditures		**5,524**	1,420	4,104	289.0%
Financial and other revenues		**6,379**	6,524	(145)	(2.2%)
Financial and other expenditures		**5,163**	4,740	423	8.9%
Total comprehensive earnings for the year		**$ 6,549**	$ 3,010	$ 3,539	117.6%

Notes related to Table 14:

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

A) *Operating revenues* of $57.3 million are $1.7 million higher than the prior year. Details have been discussed in preceding pages.

B) *Operating expenditures* of $51.8 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 $6.5 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.

Attachments

Attachment 1: Financial results for the four months ended July 31, 2023.

Report prepared by: Alicia Scallion

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Syed Ahmed, MBA
Manager, Accounting, (902) 497-2502

HALIFAX WATER
UNAUDITED STATEMENT OF FINANCIAL POSITION - IFRS
July 31, 2023 (in thousands)

July 31 (in thousands)	2023	2022	March 31 2023	From Prior Year $ Change	From Prior Year % Change
Assets					
Current					
Cash and cash equivalents	$ 30,195	$ 69,465	$ 44,596	$ (39,270)	(56.5%)
Receivables					
Customer charges and contractual	21,139	16,419	17,824	4,720	28.7%
Unbilled service revenues	21,406	20,706	19,265	700	3.4%
Halifax Regional Municipality	7,256	10,949	11,287	(3,693)	(33.7%)
Inventory	2,266	2,174	3,517	92	4.2%
Prepaids	1,040	2,200	1,282	(1,161)	(52.8%)
	83,302	121,913	97,770	(38,611)	(31.7%)
Intangible assets	22,807	20,008	22,807	2,799	14.0%
Capital work in progress	100,275	69,822	79,447	30,453	43.6%
Utility plant in service	1,285,735	1,261,008	1,302,515	24,727	2.0%
Total assets	1,492,119	1,472,751	1,502,540	19,368	1.3%
Regulatory deferral account	2,173	2,365	2,236	(192)	(8.1%)
Total assets and regulatory deferral account	**$ 1,494,292**	**$ 1,475,116**	**$ 1,504,776**	**$ 19,176**	**1.3%**
Liabilities					
Current					
Payables and accruals					
Trade	20,901	18,254	33,826	2,647	14.5%
Non-trade	4,324	3,886	4,717	438	11.3%
Interest on long term debt	1,600	1,678	2,205	(77)	(4.6%)
Contractor and customer deposits	3,308	2,941	2,841	367	12.5%
Current portion of deferred contributed capital	18,836	14,614	18,836	4,222	28.9%
Current portion of long term debt	45,962	46,272	45,962	(310)	(0.7%)
Unearned revenue	75	7,394	76	(7,319)	(99.0%)
	95,007	95,038	108,463	(31)	(0.0%)
Deferred contributed capital	910,472	895,602	919,422	14,869	1.7%
Long term debt	164,742	187,107	172,489	(22,365)	(12.0%)
Employee benefit obligation	11,199	44,989	8,078	(33,790)	(75.1%)
Total liabilities	1,181,419	1,222,736	1,208,452	(41,317)	(3.4%)
Equity					
Accumulated other comprehensive loss	51,651	11,226	51,651	40,425	360.1%
Accumulated surplus	261,221	241,153	244,672	20,067	8.3%
Total equity	312,872	252,379	296,323	60,493	24.0%
Total liabilities and equity	**$ 1,494,291**	**$ 1,475,115**	**$ 1,504,775**	**$ 19,176**	**1.3%**

HALIFAX WATER
UNAUDITED STATEMENT OF EARNINGS AND COMPREHENSIVE EARNINGS - ALL SERVICES - IFRS
APRIL 1, 2023 - JULY 31, 2023 (4 MONTHS)
ACTUAL YEAR TO DATE COMPLETE: 33.33%

	ACTUAL YEAR TO DATE THIS YEAR '000	ACTUAL YEAR TO DATE LAST YEAR '000	APR 1/22 MAR 31/23 BUDGET '000	ACTUAL YEAR TO DATE as % of BUDGET	From Prior Year $ Change	From Prior Year % Change
Operating revenues						
Water	$ 18,161	$ 16,396	$ 53,669	33.84%	$ 1,765	10.77%
Wastewater	29,865	27,245	87,555	34.11%	2,620	9.61%
Stormwater	5,192	3,831	15,388	33.74%	1,360	35.51%
Public fire protection	2,694	2,636	8,083	33.33%	59	2.22%
Private fire protection	555	451	1,652	33.59%	104	22.99%
Other operating revenue	873	968	2,549	34.26%	(95)	(9.78%)
	57,340	**51,527**	**168,896**	**33.95%**	**5,813**	**11.28%**
Operating expenditures						
Water supply and treatment	3,919	3,548	12,621	31.05%	370	10.44%
Water transmission and distribution	4,098	3,921	13,203	31.04%	177	4.51%
Wastewater collection	4,280	4,128	13,554	31.58%	152	3.68%
Stormwater collection	1,598	1,392	5,382	29.69%	206	14.84%
Wastewater treatment	7,156	7,279	25,065	28.55%	(123)	(1.69%)
Engineering and technology services	4,642	4,425	14,009	33.14%	217	4.89%
Regulatory compliance services	1,540	1,452	5,060	30.43%	88	6.05%
Customer services	1,378	1,482	4,526	30.45%	(104)	(6.99%)
Corporate services	1,105	958	3,655	30.23%	147	15.30%
Administration services	1,678	1,750	6,197	27.08%	(72)	(4.10%)
Pension services	3,138	3,138	9,415	33.33%	0	0.00%
Depreciation and amortization	17,474	16,826	50,548	34.57%	649	3.85%
	52,007	**50,300**	**163,234**	**31.86%**	**1,707**	**3.39%**
Earnings (loss) from operations before financial and other revenues and expenditures	**5,333**	**1,227**	**5,662**	**94.18%**	**4,106**	**334.70%**
Financial and other revenues						
Interest	80	106	324	24.84%	(25)	(23.74%)
Amortization of contributed capital	6,111	6,242	17,864	34.21%	(131)	(2.11%)
Other	188	175	627	30.01%	13	7.31%
	6,379	**6,523**	**18,815**	**33.91%**	**(144)**	**(2.20%)**
Financial and other expenditures						
Interest on long term debt	2,350	2,460	7,050	33.34%	(109)	(4.45%)
Amortization of debt discount	72	82	201	35.62%	(10)	(12.47%)
Dividend/grant in lieu of taxes	2,709	2,156	6,589	41.11%	553	25.66%
Other	32	43	175	18.42%	(10)	(24.31%)
	5,163	**4,740**	**14,016**	**36.84%**	**423**	**8.93%**
Total comprehensive earnings for the year	**$ 6,549**	**$ 3,010**	**$ 10,461**	**62.60%**	**$ 3,539**	**117.59%**

HALIFAX WATER
UNAUDITED STATEMENT OF FINANCIAL POSITION - NSUARB
July 31, 2023 (in thousands)

July 31 (in thousands)	Notes	2023	2022	March 31 2023	From Prior Year $ Change	From Prior Year % Change
Assets						
Current						
Cash and cash equivalents	A	$ 30,195	$ 69,465	$ 44,596	$ (39,270)	(56.5%)
Receivables						
Customer charges and contractual	B	21,139	16,419	17,825	4,720	28.7%
Unbilled service revenues	C	21,406	20,706	19,265	700	3.4%
Halifax Regional Municipality	D	7,256	10,949	11,305	(3,693)	(33.7%)
Inventory		2,266	2,174	3,517	92	4.2%
Prepaids	E	1,040	2,200	1,282	(1,161)	(52.8%)
		83,302	121,913	97,789	(38,611)	(31.7%)
Capital work in progress	F	100,273	69,823	79,447	30,450	43.6%
Utility plant in service	G	1,312,021	1,317,786	1,363,809	(5,765)	(0.4%)
Total assets		1,495,596	1,509,522	1,541,046	(13,926)	(0.9%)
Regulatory deferral account		2,173	2,365	2,237	(192)	(8.1%)
Total assets and regulatory deferral account		**$ 1,497,769**	**$ 1,511,887**	**$ 1,543,283**	**$ (14,118)**	**(0.9%)**
Liabilities						
Current						
Payables and accruals						
Trade	A	20,901	18,254	33,827	2,647	14.5%
Non-trade		4,324	3,886	4,717	438	11.3%
Interest on long term debt		1,600	1,678	2,205	(77)	(4.6%)
Contractor and customer deposits		3,308	2,941	2,841	367	12.5%
Current portion of long term debt		45,962	46,272	45,962	(310)	(0.7%)
Unearned revenue	B	75	7,394	95	(7,319)	(99.0%)
		76,171	80,424	89,647	(4,254)	(5.3%)
Long term debt	C	164,742	187,107	172,489	(22,365)	(12.0%)
Deferred contributions	D	100,996	76,917	94,210	24,079	31.3%
Total liabilities		341,909	344,449	356,346	(2,540)	(0.7%)
Equity						
Accumulated capital surplus		1,128,088	1,127,044	1,153,390	1,043	0.1%
Accumulated operating surplus		12,168	29,123	28,925	(16,955)	(58.2%)
Operating surplus used to fund capital		12,380	12,380	12,380	0	0.0%
Deficiency of revenues over expenditures		3,224	(1,111)	(7,757)	4,335	(390.3%)
Total equity		1,155,860	1,167,437	1,186,938	(11,577)	(1.0%)
Total liabilities and equity		**$ 1,497,769**	**$ 1,511,886**	**$ 1,543,284**	**$ (14,116)**	**(0.9%)**

HALIFAX WATER
UNAUDITED STATEMENT OF EARNINGS - ALL SERVICES - NSUARB
APRIL 1, 2023 - JULY 31, 2023 (4 MONTHS)
ACTUAL YEAR TO DATE COMPLETE: 33.33%

	ACTUAL YEAR TO DATE THIS YEAR '000	ACTUAL YEAR TO DATE LAST YEAR '000	APR 1/22 MAR 31/23 BUDGET '000	ACTUAL YEAR TO DATE as % of BUDGET	From Prior Year $ Change	From Prior Year % Change	Actual to Budget $ Remaining	Actual to Budget % Remaining
Operating revenues								
Water	$ 18,161	$ 16,396	$ 53,669	33.84%	$ 1,765	10.77%	$ (35,508)	(66.16%)
Wastewater	29,865	27,245	87,555	34.11%	2,620	9.61%	(57,690)	(65.89%)
Stormwater site generated service	3,020	2,297	8,873	34.04%	723	31.45%	(5,853)	(65.96%)
Stormwater right of way service	2,172	1,534	6,515	33.33%	638	41.58%	(4,344)	(66.67%)
Fire protection (public and private)	3,249	3,087	9,736	33.38%	162	5.26%	(6,486)	(66.62%)
Other services and fees	540	544	1,367	39.54%	(4)	(0.70%)	(826)	(60.46%)
Late payment and other connection fees	105	150	626	16.74%	(45)	(30.10%)	(521)	(83.26%)
Miscellaneous	228	273	556	41.00%	(46)	(16.70%)	(328)	(59.00%)
	57,340	**51,527**	**168,896**	**33.95%**	**5,813**	**11.28%**	**(111,556)**	**(66.05%)**
Operating expenditures								
Water supply and treatment	3,919	3,548	12,621	31.05%	370	10.44%	(8,702)	(68.95%)
Water transmission and distribution	4,098	3,921	13,203	31.04%	177	4.51%	(9,105)	(68.96%)
Wastewater collection	4,280	4,128	13,554	31.58%	152	3.68%	(9,273)	(68.42%)
Stormwater collection	1,598	1,392	5,382	29.69%	206	14.84%	(3,784)	(70.31%)
Wastewater treatment	7,156	7,279	25,065	28.55%	(123)	(1.69%)	(17,909)	(71.45%)
Engineering and technology services	4,642	4,425	14,009	33.14%	217	4.89%	(9,367)	(66.86%)
Regulatory compliance services	1,540	1,452	5,060	30.43%	88	6.05%	(3,520)	(69.57%)
Customer services	1,378	1,482	4,526	30.45%	(104)	(6.99%)	(3,148)	(69.55%)
Corporate services	1,105	958	3,655	30.23%	147	15.30%	(2,550)	(69.77%)
Administration services	1,678	1,750	6,197	27.08%	(72)	(4.10%)	(4,519)	(72.92%)
Depreciation and amortization	10,591	10,118	32,684	32.40%	473	4.68%	(22,093)	(67.60%)
	41,986	**40,454**	**135,955**	**30.88%**	**1,532**	**3.79%**	**(93,969)**	**(69.12%)**
Earnings from operations before financial and other revenues and expenditures	**15,354**	**11,073**	**32,941**	**46.61%**	**4,281**	**38.66%**	**(17,587)**	**(53.39%)**
Financial and other revenues								
Interest	80	106	324	24.84%	(25)	(23.74%)	(244)	(75.16%)
Other	188	175	627	30.01%	13	7.31%	(439)	(69.99%)
	269	**281**	**951**	**28.25%**	**(12)**	**(4.35%)**	**(682)**	**(71.75%)**
Financial and other expenditures								
Interest on long term debt	2,350	2,460	7,050	33.34%	(109)	(4.45%)	(4,700)	(66.66%)
Repayment on long term debt	7,235	7,724	22,191	32.61%	(489)	(6.33%)	(14,956)	(67.39%)
Amortization of debt discount	72	82	201	35.62%	(10)	(12.47%)	(130)	(64.38%)
Dividend/grant in lieu of taxes	2,709	2,156	6,589	41.11%	553	25.66%	(3,880)	(58.89%)
Other	32	43	175	18.42%	(11)	(25.09%)	(143)	(81.58%)
	12,398	**12,465**	**36,207**	**34.24%**	**(66)**	**(0.53%)**	**(23,809)**	**(65.76%)**
Earnings (loss) for the year	**$ 3,224**	**$ (1,111)**	**$ (2,315)**	**(139.28%)**	**$ 4,335**	**(390.28%)**	**$ 5,540**	**(239.28%)**

HALIFAX WATER
UNAUDITED STATEMENT OF EARNINGS - WATER - NSUARB
APRIL 1, 2023 - JULY 31, 2023 (4 MONTHS)
ACTUAL YEAR TO DATE COMPLETE: 33.33%

	ACTUAL YEAR TO DATE THIS YEAR '000	ACTUAL YEAR TO DATE LAST YEAR '000	APR 1/22 MAR 31/23 BUDGET '000	ACTUAL YEAR TO DATE as % of BUDGET	From Prior Year $ Change	From Prior Year % Change	Actual to Budget $ Remaining	Actual to Budget % Remaining
Operating revenues								
Water	$ 18,161	$ 16,396	$ 53,669	33.84%	$ 1,765	10.77%	$ (35,508)	(66.16%)
Public fire protection	2,694	2,636	8,083	33.33%	59	2.22%	(5,389)	(66.67%)
Private fire protection	555	451	1,652	33.59%	104	22.99%	(1,097)	(66.41%)
Bulk water stations	151	138	338	44.57%	12	8.85%	(187)	(55.43%)
Late payment and other connection fees	29	59	252	11.69%	(30)	(50.33%)	(223)	(88.31%)
Miscellaneous	116	108	258	44.97%	8	7.46%	(142)	(55.03%)
	21,707	**19,788**	**64,252**	**33.78%**	**1,918**	**9.69%**	**(42,546)**	**(66.22%)**
Operating expenditures								
Water supply and treatment	3,919	3,548	12,621	31.05%	370	10.44%	(8,702)	(68.95%)
Water transmission and distribution	4,098	3,921	13,203	31.04%	177	4.51%	(9,105)	(68.96%)
Engineering and technology services	1,844	1,505	4,703	39.21%	339	22.51%	(2,859)	(60.79%)
Regulatory compliance services	520	445	1,521	34.21%	75	16.96%	(1,001)	(65.79%)
Customer services	752	755	2,308	32.58%	(3)	(0.40%)	(1,556)	(67.42%)
Corporate services	596	489	1,864	31.98%	107	21.95%	(1,268)	(68.02%)
Administration services	1,052	931	3,160	33.28%	121	13.02%	(2,109)	(66.72%)
Depreciation and amortization	4,033	3,891	12,594	32.02%	142	3.64%	(8,561)	(67.98%)
	16,813	**15,485**	**51,974**	**32.35%**	**1,329**	**8.58%**	**(35,161)**	**(67.65%)**
Earnings from operations before financial and other revenues and expenditures	**4,893**	**4,304**	**12,278**	**39.86%**	**590**	**13.70%**	**(7,384)**	**(60.14%)**
Financial and other revenues								
Interest	78	84	259	30.16%	(6)	(7.44%)	(181)	(69.84%)
Other	155	142	465	33.22%	12	8.69%	(311)	(66.78%)
	233	**227**	**724**	**32.12%**	**6**	**2.68%**	**(492)**	**(67.88%)**
Financial and other expenditures								
Interest on long term debt	805	786	2,767	29.09%	19	2.36%	(1,962)	(70.91%)
Repayment on long term debt	1,948	2,065	6,077	32.06%	(117)	(5.66%)	(4,129)	(67.94%)
Amortization of debt discount	28	29	79	35.38%	(2)	(5.58%)	(51)	(64.62%)
Dividend/grant in lieu of taxes	2,327	1,851	5,664	41.09%	477	25.75%	(3,337)	(58.91%)
Other	30	40	130	22.85%	(10)	(24.97%)	(100)	(77.15%)
	5,138	**4,771**	**14,717**	**34.91%**	**367**	**7.69%**	**(9,579)**	**(65.09%)**
Loss for the year	**$ (12)**	**$ (241)**	**$ (1,715)**	**0.70%**	**$ 229**	**(95.03%)**	**$ 1,703**	**(99.30%)**

HALIFAX WATER
UNAUDITED STATEMENT OF EARNINGS - WASTEWATER - NSUARB
APRIL 1, 2023 - JULY 31, 2023 (4 MONTHS)
ACTUAL YEAR TO DATE COMPLETE: 33.33%

	ACTUAL YEAR TO DATE THIS YEAR '000	ACTUAL YEAR TO DATE LAST YEAR '000	APR 1/22 MAR 31/23 BUDGET '000	ACTUAL YEAR TO DATE as % of BUDGET	From Prior Year $ Change	From Prior Year % Change	Actual to Budget $ Remaining	Actual to Budget % Remaining
Operating revenues								
Wastewater	$ 29,865	$ 27,245	$ 87,555	34.11%	$ 2,620	9.61%	$ (57,690)	(65.89%)
Leachate and other contract revenue	163	145	494	33.03%	19	12.89%	(331)	(66.97%)
Septage tipping fees	208	237	535	38.94%	(29)	(12.08%)	(327)	(61.06%)
Overstrength surcharge	0	13	0	0.00%	(13)	(100.00%)	0	0.00%
Airplane effluent	18	12	0	0.00%	7	58.87%	18	0.00%
Late payment and other connection fees	63	84	234	26.88%	(21)	(24.99%)	(171)	(73.12%)
Miscellaneous	79	50	223	35.65%	29	58.34%	(143)	(64.35%)
	30,397	**27,785**	**89,040**	**34.14%**	**2,612**	**9.40%**	**(58,643)**	**(65.86%)**
Operating expenditures								
Wastewater collection	4,280	4,128	13,554	31.58%	152	3.68%	(9,273)	(68.42%)
Wastewater treatment	7,156	7,279	25,065	28.55%	(123)	(1.69%)	(17,909)	(71.45%)
Engineering and technology services	2,310	2,255	7,096	32.56%	55	2.45%	(4,785)	(67.44%)
Regulatory compliance services	490	717	1,733	28.29%	(227)	(31.62%)	(1,243)	(71.71%)
Customer services	572	664	2,028	28.20%	(92)	(13.91%)	(1,457)	(71.80%)
Corporate services	458	423	1,612	28.42%	35	8.38%	(1,154)	(71.58%)
Administration services	567	737	2,733	20.74%	(171)	(23.13%)	(2,166)	(79.26%)
Depreciation and amortization	5,598	5,394	17,310	32.34%	204	3.78%	(11,713)	(67.66%)
	21,432	**21,598**	**71,131**	**30.13%**	**(166)**	**(0.77%)**	**(49,700)**	**(69.87%)**
Earnings from operations before financial and other revenues and expenditures	**8,965**	**6,187**	**17,909**	**50.06%**	**2,778**	**44.91%**	**(8,944)**	**(49.94%)**
Financial and other revenues								
Interest	29	34	104	28.15%	(5)	(14.49%)	(74)	(71.85%)
Other	34	33	162	20.79%	0	1.41%	(128)	(79.21%)
	63	**67**	**266**	**23.66%**	**(4)**	**(6.65%)**	**(203)**	**(76.34%)**
Financial and other expenditures								
Interest on long term debt	1,300	1,424	3,385	38.41%	(124)	(8.70%)	(2,085)	(61.59%)
Repayment on long term debt	4,481	4,961	13,790	32.49%	(480)	(9.68%)	(9,309)	(67.51%)
Amortization of debt discount	36	45	99	36.21%	(9)	(19.62%)	(63)	(63.79%)
Dividend/grant in lieu of taxes	324	259	786	41.25%	65	25.00%	(462)	(58.75%)
Other	3	3	45	5.61%	(1)	(26.41%)	(42)	(94.39%)
	6,143	**6,692**	**18,104**	**33.93%**	**(549)**	**(8.20%)**	**(11,961)**	**(66.07%)**
Earnings (loss) for the year	**$ 2,884**	**$ (438)**	**$ 70**	**4109.86%**	**$ 3,323**	**(758.53%)**	**$ 2,814**	**4009.86%**

HALIFAX WATER
UNAUDITED STATEMENT OF EARNINGS - STORMWATER - NSUARB
APRIL 1, 2023 - JULY 31, 2023 (4 MONTHS)
ACTUAL YEAR TO DATE COMPLETE: 33.33%

	ACTUAL YEAR TO DATE THIS YEAR '000	ACTUAL YEAR TO DATE LAST YEAR '000	APR 1/22 MAR 31/23 BUDGET '000	ACTUAL YEAR TO DATE as % of BUDGET	From Prior Year $ Change	From Prior Year % Change	Actual to Budget $ Remaining	Actual to Budget % Remaining
Operating revenues								
Stormwater site generated service	$ 3,020	$ 2,297	$ 8,873	34.04%	$ 723	31.45%	$ (5,853)	(65.96%)
Stormwater right of way service	2,172	1,534	6,515	33.33%	638	41.58%	(4,344)	(66.67%)
Late payment and other connection fees	13	7	141	8.96%	6	80.72%	(128)	(91.04%)
Miscellaneous	33	116	75	43.25%	(83)	(71.76%)	(43)	(56.75%)
	5,237	**3,954**	**15,604**	**33.56%**	**1,283**	**32.45%**	**(10,367)**	**(66.44%)**
Operating expenditures								
Stormwater collection	1,598	1,392	5,382	29.69%	206	14.84%	(3,784)	(70.31%)
Engineering and technology services	488	665	2,210	22.07%	(177)	(26.66%)	(1,722)	(77.93%)
Regulatory compliance services	529	290	1,806	29.31%	239	82.42%	(1,276)	(70.69%)
Customer services	54	62	189	28.62%	(8)	(13.04%)	(135)	(71.38%)
Corporate services	51	47	179	28.42%	4	8.38%	(128)	(71.58%)
Administration services	60	82	304	19.65%	(22)	(27.16%)	(244)	(80.35%)
Depreciation and amortization	961	833	2,780	34.57%	128	15.34%	(1,819)	(65.43%)
	3,741	**3,371**	**12,850**	**29.11%**	**370**	**10.96%**	**(9,109)**	**(70.89%)**
Earnings from operations before financial and other revenues and expenditures	**1,496**	**582**	**2,754**	**54.31%**	**913**	**156.81%**	**(1,258)**	**(45.69%)**
Financial and other revenues								
Interest	(27)	(13)	(39)	69.10%	(14)	106.02%	12	(30.90%)
	(27)	**(13)**	**(39)**	**69.10%**	**(14)**	**106.02%**	**12**	**(30.90%)**
Financial and other expenditures								
Interest on long term debt	246	250	899	27.31%	(4)	(1.67%)	(653)	(72.69%)
Repayment on long term debt	806	698	2,324	34.70%	108	15.48%	(1,517)	(65.30%)
Amortization of debt discount	8	8	24	33.99%	0	2.08%	(16)	(66.01%)
Dividend/grant in lieu of taxes	57	45	139	41.09%	12	25.75%	(82)	(58.91%)
	1,117	**1,001**	**3,386**	**32.99%**	**116**	**11.56%**	**(2,269)**	**(67.01%)**
Earnings (loss) for the year	**$ 352**	**$ (432)**	**$ (670)**	**(52.50%)**	**$ 784**	**(181.47%)**	**$ 1,022**	**(152.50%)**

HALIFAX WATER
UNAUDITED STATEMENT OF EARNINGS - REGULATED AND UNREGULATED ACTIVITIES - NSUARB
APRIL 1, 2023 - JULY 31, 2023 (4 MONTHS)
ACTUAL YEAR TO DATE COMPLETE: 33.33%

	ACTUAL YEAR TO DATE THIS YEAR '000	ACTUAL YEAR TO DATE LAST YEAR '000	APR 1/22 MAR 31/23 BUDGET '000	ACTUAL YEAR TO DATE as % of BUDGET	From Prior Year $ Change	From Prior Year % Change	Actual to Budget $ Remaining	Actual to Budget % Remaining
REGULATED ACTIVITIES								
Operating revenues								
Water	$ 18,161	$ 16,396	$ 53,669	33.84%	$ 1,765	10.77%	$ (35,508)	(66.16%)
Wastewater	29,865	27,245	87,555	34.11%	2,620	9.61%	(57,690)	(65.89%)
Stormwater	5,192	3,831	15,388	33.74%	1,360	35.51%	(10,196)	(66.26%)
Public fire protection	2,694	2,636	8,083	33.33%	59	2.22%	(5,389)	(66.67%)
Private fire protection	555	451	1,652	33.59%	104	22.99%	(1,097)	(66.41%)
Miscellaneous	483	562	1,520	31.80%	(79)	(13.99%)	(1,036)	(68.20%)
	56,950	**51,121**	**167,867**	**33.93%**	**5,829**	**11.40%**	**(110,917)**	**(66.07%)**
Operating expenditures								
Water supply and treatment	3,913	3,539	12,621	31.01%	374	10.57%	(8,708)	(68.99%)
Water transmission and distribution	4,098	3,921	13,203	31.04%	177	4.51%	(9,105)	(68.96%)
Wastewater collection	4,252	4,116	13,472	31.56%	136	3.31%	(9,220)	(68.44%)
Stormwater collection	1,598	1,392	5,382	29.69%	206	14.84%	(3,784)	(70.31%)
Wastewater treatment	6,845	7,040	24,288	28.18%	(196)	(2.78%)	(17,443)	(71.82%)
Engineering and technology services	4,642	4,425	14,009	33.14%	217	4.89%	(9,367)	(66.86%)
Regulatory compliance services	1,540	1,452	5,060	30.43%	88	6.05%	(3,520)	(69.57%)
Customer services	1,403	1,467	4,486	31.26%	(64)	(4.38%)	(3,084)	(68.74%)
Corporate services	1,101	952	3,642	30.22%	148	15.55%	(2,542)	(69.78%)
Administration services	1,650	1,689	6,067	27.20%	(38)	(2.27%)	(4,417)	(72.80%)
Depreciation and amortization	10,589	10,112	32,650	32.43%	477	4.72%	(22,061)	(67.57%)
	41,630	**40,105**	**134,879**	**30.86%**	**1,525**	**3.80%**	**(93,249)**	**(69.14%)**
Earnings from operations before financial and other revenues and expenditures	**15,320**	**11,016**	**32,988**	**46.44%**	**4,304**	**39.07%**	**(17,668)**	**(53.56%)**
Financial and other revenues								
Interest	80	106	324	24.84%	(25)	(23.74%)	(244)	(75.16%)
Other	4	16	38	9.44%	(12)	(77.67%)	(34)	(90.56%)
	84	**122**	**362**	**23.23%**	**(37)**	**(30.83%)**	**(278)**	**(76.77%)**
Financial and other expenditures								
Interest on long term debt	2,350	2,460	7,050	33.34%	(109)	(4.45%)	(4,700)	(66.66%)
Repayment on long term debt	7,235	7,724	22,191	32.61%	(489)	(6.33%)	(14,956)	(67.39%)
Amortization of debt discount	72	82	201	35.62%	(10)	(12.47%)	(130)	(64.38%)
Dividend/grant in lieu of taxes	2,709	2,156	6,589	41.11%	553	25.66%	(3,880)	(58.89%)
	12,366	**12,422**	**36,032**	**34.32%**	**(55)**	**(0.45%)**	**(23,666)**	**(65.68%)**
Earnings (loss) for the year - Regulated	**$ 3,038**	**$ (1,284)**	**$ (2,682)**	**(113.25%)**	**$ 4,322**	**(336.54%)**	**$ 5,720**	**(213.25%)**

HALIFAX WATER
UNAUDITED STATEMENT OF EARNINGS - REGULATED AND UNREGULATED ACTIVITIES - NSUARB
APRIL 1, 2023 - JULY 31, 2023 (4 MONTHS)
ACTUAL YEAR TO DATE COMPLETE: 33.33%

	ACTUAL YEAR TO DATE THIS YEAR '000	ACTUAL YEAR TO DATE LAST YEAR '000	APR 1/22 MAR 31/23 BUDGET '000	ACTUAL YEAR TO DATE as % of BUDGET	From Prior Year $ Change	From Prior Year % Change	Actual to Budget 33	Actual to Budget % Remaining
UNREGULATED ACTIVITIES								
Operating revenues								
Septage tipping fees	$ 208	$ 237	$ 535	38.94%	$ (29)	(12.08%)	$ (327)	(61.06%)
Leachate and other contract revenue	163	145	494	33.03%	19	12.89%	(331)	(66.97%)
Airplane effluent	18	12	0	0.00%	7	58.87%	18	0.00%
Miscellaneous	0	13	0	0.00%	(13)	(100.00%)	0	0.00%
	390	**406**	**1,029**	**37.89%**	**(16)**	**(3.95%)**	**(639)**	**(62.11%)**
Operating expenditures								
Water supply and treatment	5	9	0	0.00%	(4)	(40.07%)	5	0.00%
Wastewater treatment	312	239	777	40.11%	73	30.55%	(466)	(59.89%)
Wastewater collection	28	13	81	34.78%	15	119.97%	(53)	(65.22%)
Sponsorships and donations	(24)	39	73	(33.15%)	(63)	(162.02%)	(97)	(133.15%)
Corporate services	4	6	13	34.10%	(1)	(25.00%)	(9)	(65.90%)
Administration services	28	37	97	28.69%	(9)	(25.00%)	(69)	(71.31%)
Depreciation and amortization	2	6	34	5.38%	(4)	(69.40%)	(32)	(94.62%)
	355	**349**	**1,076**	**33.04%**	**7**	**1.90%**	**(720)**	**(66.96%)**
Earnings from operations before financial and other revenues and expenditures	**34**	**57**	**(47)**	**(73.53%)**	**(23)**	**(39.71%)**	**81**	**(173.53%)**
Financial and other revenues								
Other - leases and rentals	90	87	365	24.76%	4	4.24%	(274)	(75.24%)
Other - energy projects	94	73	225	42.00%	22	29.64%	(130)	(58.00%)
	185	**159**	**589**	**31.33%**	**25**	**15.84%**	**(405)**	**(68.67%)**
Financial and other expenditures								
Other	32	43	175	18.42%	(11)	(25.09%)	(143)	(81.58%)
	32	**43**	**175**	**18.42%**	**(11)**	**(25.09%)**	**(143)**	**(81.58%)**
Earnings for the year - Unregulated	**$ 187**	**$ 173**	**$ 367**	**50.87%**	**$ 13**	**7.71%**	**$ (180)**	**(49.13%)**
Total earnings (loss) for the year (Regulated and Unregulated)	**$ 3,224**	**$ (1,111)**	**$ (2,315)**	**(139.28%)**	**$ 4,335**	**(390.28%)**	**$ 5,540**	**(239.28%)**

ITEM #4.2

Halifax Water Board

September 28, 2023

TO: Colleen Rollings, P.Eng., PMP., Chair and Members of the Halifax Regional Water Commission Board

SUBMITTED BY: Louis de Montbrun (Sep 21, 2023 16:28 ADT)
Louis de Montbrun, CPA, CA, Director, Corporate Services/CFO

APPROVED: Tareq Al-Zabet (Sep 22, 2023 13:48 ADT)
Tareq Al-Zabet, Ph.D., CRSP, P.Geo, CEO & General Manager

DATE: September 8, 2023

SUBJECT: Capital Expenditures for the four months ended July 31, 2023

ORIGIN

The Corporate Balanced Scorecard identifies the percentage of current year capital budget spent by the end of the fiscal year as a critical success factor and sets a target of 70-80%. A new metric was added for the 2023/24 fiscal year which is a target of $135 million in capital spend during the year.

BACKGROUND

At the September 8, 2023, meeting of the Halifax Water Audit and Finance Committee, the attached report was reviewed and discussed. The report is presented to the Halifax Water Board for review and information.

ATTACHMENTS

1. Report to the Halifax Water Audit and Finance Committee re. Capital Expenditure Report July 31, 2023.

Report prepared by: Syed Ahmed (Sep 20, 2023 13:54 ADT)
Syed Ahmed, MBA, Manager, Accounting
Phone: 902- 497-2502

Halifax Water

ITEM #5

Halifax Water Audit and Finance Committee

September 8, 2023

TO: Chair and Members of the Halifax Regional Water Commission Audit and Finance Committee

SUBMITTED BY: A. Scallion on behalf of Louis de Montbrun
Digitally signed by A. Scallion on behalf of Louis de Montbrun
Date: 2023.08.31 17:36:27 -03'00'

Louis de Montbrun, CPA, CA
Director, Corporate Services

Digitally signed by Reid Campbell
Date: 2023.09.01 09:00:52 -03'00'

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

APPROVED: Tareq Al-Zabet
Digitally signed by Tareq Al-Zabet
Date: 2023.09.01 13:22:57 -03'00'

Tareq Al-Zabet, Ph.D., CRSP, P. Geo
Chief Executive Officer and General Manager

DATE: August 24, 2023

SUBJECT: **Capital Expenditures for the four months ended July 31, 2023**

ORIGIN

The Corporate Balanced Scorecard identifies the percentage of current year capital budget spent by the end of the fiscal year as a critical success factor and sets a target of 70-80%. A new metric was added for the 2023/24 fiscal year which is a target of $135 million in capital spend during the year.

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 - 2019). 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 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 four months ended July 31, 2023. Halifax Water has spent $101.1 million to date on active projects, of which $22.7 million was spent during the four months ended July 31, 2023. Approximately $5.9 million of the $22.7 million relates to the 2023/24 capital budget of $146.7 million, resulting in a year-to-date delivery rate of 4.0% (2022/23 7.7%). Progress is being made on most of the significant projects in this year's capital budget. Local contractors have been deployed by Halifax Water and HALIFAX on emergency repair work to roads, bridges, and culverts. Consequently, contractors are beginning to request that work tendered for this year be deferred to the next construction season. Halifax Water staff will continue to monitor this to be able to assess the impact on this year's construction season.

Halifax Water is trying to improve on annual Integrated Resource Plan (IRP) execution and can measure progress through the number of projects completed annually (close-outs) and the dollar value of projects completed as a percentage of total available capital spend. The total capital budget remaining to be spent at July 31, 2023 is $301.9 million, an increase of $50.6 million from July 31, 2022 largely due to the 2023/24 annual budget of $146.7 million compared to an annual budget of $106.5 million for 2022/23.

The average capital spend per month compared to prior year has increased from $4.7 million to $5.7 million. Achievement of targets for this fiscal year will be dependent on the timing of several large projects. The Burnside Operations Centre is about to complete the design validation phase, The Biosolids Processing Facility is about to be issued for procurement and the Fairview Cove Trunk Sewer is due to be tendered in January with some minor land issues remaining. The timing of each project achieving milestones, given their size, will have a large influence on capital spending this year.

Capital Expenditure Report

Budget Category	Total Budget Available	Expenditures to March 31, 2023	Expenditures April 1, 2023 to July 31, 2023	Total Expenditures to July 31, 2023	Remaining Budget Available as of July 31, 2023	Total Expenditures to July 31, 2023 as a Percentage of Total Budget Available	Expenditures to March 31, 2023 as a Percentage of Total Forecasted Expenditures
Active							
Water	$ 187,710,976	$ 41,302,746	$ 14,732,377	$ 56,035,123	$ 131,675,852	29.9%	38.8%
Wastewater	166,398,180	35,230,542	6,839,104	42,069,646	124,328,534	25.3%	64.4%
Stormwater	17,030,263	1,827,126	1,170,700	2,997,826	14,032,438	17.6%	67.0%
	371,139,419	**78,360,414**	**22,742,181**	**101,102,595**	**270,036,824**	**27.2%**	**47.2%**
Pending							
Water	9,132,277	27,888	-	27,888	9,104,389	0.3%	0.0%
Wastewater	21,982,000	-	-	-	21,982,000	0.0%	0.0%
Stormwater	784,238	-	-	-	784,238	0.0%	0.0%
	31,898,515	**27,888**	**-**	**27,888**	**31,870,627**	0.1%	2.5%
	$ 403,037,934	**$ 78,388,302**	**$ 22,742,181**	**$ 101,130,483**	**$ 301,907,451**	25.1%	47.0%

The Total Budget Available of $403.0 million represents total approved budgets for pending and active projects as at the end of July 31, 2023.

Total Expenditures to July 31, 2023, of $101.1 million include expenditures of $78.4 million incurred prior to April 1, 2023, and expenditures of $22.7 million in the current fiscal year. This results in a Remaining Budget Available as of July 31, 2023, of $301.9 million.

In the Pending project category, there is $28.4 million that has been deferred or cancelled. This funding is available to be reallocated to existing projects, if required, or used to fund future capital budgets.

ATTACHMENT

Capital Expenditure Report July 31, 2023

Report prepared by: Corey Ellis

Corey Ellis, CPA, CGA, Accountant, (902)-490-2976

Capital Expenditure Report
For the Period Ending July 31/23

Status	Service	Asset Category	Total Budget Available	Expenditures to March 31, 2023	Expenditures April 1, 2023 to July 31, 2023	Total Expenditures to July 31, 2023	Remaining Budget Available as of July 31, 2023
Active	W	Water - Land	745,000	44,796	-	44,796	700,204
		Water - Transmission	38,196,000	2,773,102	4,384,561	7,157,663	31,038,337
		Water - Distribution	14,513,814	364,233	2,107,026	2,471,259	12,042,555
		Water - Energy	600,000	4,898	-	4,898	595,102
		Water - Structures	28,058,000	6,909,990	2,150,763	9,060,753	18,997,247
		Water - Treatment Facilities	23,544,400	1,059,611	402,194	1,461,805	22,082,595
		Water - Security	175,000	2,065	7,205	9,270	165,730
		Water - Equipment	10,713,000	8,336,034	454,331	8,790,365	1,922,635
		Water - Corporate Projects	71,165,762	21,808,017	5,226,297	27,034,314	44,131,448
	W Total		**187,710,976**	**41,302,746**	**14,732,377**	**56,035,123**	**131,675,853**
	WW	Wastewater - Trunk Sewers	251,963	-	-	-	251,963
		Wastewater - Collection System	67,951,381	20,767,991	2,356,212	23,124,203	44,827,178
		Wastewater - Forcemains	7,170,000	33,944	9,744	43,688	7,126,312
		Wastewater - Structures	45,983,000	5,062,189	978,710	6,040,899	39,942,101
		Wastewater - Treatment Facility	26,638,315	7,952,247	2,987,673	10,939,920	15,698,395
		Wastewater - Energy	1,900,000	48,187	58,778	106,965	1,793,035
		Wastewater - Security	325,000	79,251	46,048	125,299	199,701
		Wastewater - Equipment	2,472,000	108,378	57,845	166,223	2,305,777
		Wastewater - Corporate Projects	13,661,521	1,140,567	344,094	1,484,661	12,176,860
		Wastewater - Unregulated	45,000	37,788	-	37,788	7,212
	WW Total		**166,398,180**	**35,230,542**	**6,839,104**	**42,069,646**	**124,328,534**
	SW	Stormwater - Pipes	6,807,000	410,418	246,126	656,544	6,150,456
		Stormwater - Culverts/Ditches	4,321,000	383,476	873,051	1,256,527	3,064,473
		Stormwater - Structures	3,900,000	676,255	6,376	682,631	3,217,369
		Stormwater - Corporate Projects	2,002,263	356,977	45,147	402,124	1,600,139
	SW Total		**17,030,263**	**1,827,126**	**1,170,700**	**2,997,826**	**14,032,437**
Active Total			**371,139,419**	**78,360,414**	**22,742,181**	**101,102,595**	**270,036,824**
Pending	W	Water - Land	580,000	-	-	-	580,000
		Water - Transmission	1,237,400	-	-	-	1,237,400
		Water - Distribution	34,000	-	-	-	34,000
		Water - Energy	455,000	-	-	-	455,000
		Water - Structures	300,000	-	-	-	300,000
		Water - Treatment Facilities	2,184,000	-	-	-	2,184,000
		Water - Corporate Projects	4,341,877	27,888	-	27,888	4,313,989
	W Total		**9,132,277**	**27,888**	**-**	**27,888**	**9,104,389**
	WW	Wastewater - Collection System	4,750,000	-	-	-	4,750,000
		Wastewater - Forcemains	60,000	-	-	-	60,000
		Wastewater - Structures	7,674,000	-	-	-	7,674,000
		Wastewater - Treatment Facility	7,580,500	-	-	-	7,580,500
		Wastewater - Energy	1,662,500	-	-	-	1,662,500
		Wastewater - Security	150,000	-	-	-	150,000
		Wastewater - Equipment	5,000	-	-	-	5,000
		Wastewater - Corporate Projects	100,000	-	-	-	100,000
	WW Total		**21,982,000**	**-**	**-**	**-**	**21,982,000**
	SW	Stormwater - Pipes	381,238	-	-	-	381,238
		Stormwater - Culverts/Ditches	280,000	-	-	-	280,000
		Stormwater - Structures	93,000	-	-	-	93,000
		Stormwater - Corporate Projects	30,000	-	-	-	30,000
	SW Total		**784,238**	**-**	**-**	**-**	**784,238**
Pending Total			**31,898,515**	**27,888**	**-**	**27,888**	**31,870,627**
Grand Total			**403,037,934**	**78,388,302**	**22,742,181**	**101,130,483**	**301,907,451**

ITEM #4.3
Halifax Water Board

September 28, 2023

TO: Colleen Rollings, P.Eng., PMP., Chair and Members of the Halifax Regional Water Commission Board

SUBMITTED BY: Louis de Montbrun (Sep 21, 2023 16:27 ADT)
Louis de Montbrun, CPA, CA, Director, Corporate Services/CFO

APPROVED: Tareq Al-Zabet (Sep 22, 2023 13:49 ADT)
Tareq Al-Zabet, Ph.D., CRSP, P.Geo, CEO & General Manager

DATE: September 8, 2023

SUBJECT: 2023 Fall Debenture

ORIGIN

Halifax Regional Water Commission (Halifax Water) participation in the Fall 2023 Nova Scotia Finance and Treasury Board, Municipal Finance Division (NSFTB) debenture issue to secure debt financing for 2022/23 additions to utility plant in service and re-finance balloon payments on existing debt.

RECOMMENDATION

It is recommended that the Halifax Water Board approve the following motion:

1. Approve the financing of $39,988,188 with a thirty-year amortization term and finance over ten years. The maximum all-inclusive rate is not to exceed 6.5%.
2. Approve the re-financing of $10,472,225 with a ten-year amortization term and financing over ten years, with an all-inclusive rate not to exceed 6.5%.

BACKGROUND

At the September 8, 2023, meeting of the Halifax Water Audit and Finance Committee, the attached report was reviewed and the Committee approved a motion to recommend the Halifax Water Board approve the financing and re-financing as presented.

ATTACHMENTS

1. Report to the Halifax Water Audit and Finance Committee re. 2023 Fall Debenture.

Report prepared by: Syed Ahmed
Syed Ahmed (Sep 20, 2023 17:03 ADT)

Syed Ahmed, MBA
Manager, Accounting
Phone: 902- 497-2502

ITEM # 7

Audit and Finance Committee

September 28, 2023

TO: Chair, and Members of the Halifax Regional Water Commission
Audit and Finance Committee

SUBMITTED BY: A. Scallion on behalf of Louis de Montbrun
Digitally signed by A. Scallion on behalf of Louis de Montbrun
Date: 2023.08.31 17:37:08 -03'00'

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

APPROVED: Tareq Al-Zabet
Digitally signed by Tareq Al-Zabet
Date: 2023.09.01 13:23:25 -03'00'

Tareq Al-Zabet, Ph.D., CRSP, P.Geo,

Chief Executive Officer/General Manager

DATE: August 24, 2023

SUBJECT: **2023 Fall Debenture**

ORIGIN

Halifax Regional Water Commission (Halifax Water) participation in the Fall 2023 Nova Scotia Finance and Treasury Board, Municipal Finance Division (NSFTB) debenture issue to secure debt financing for 2022/23 additions to utility plant in service and re-finance balloon payments on existing debt.

RECOMMENDATION

It is recommended that the Halifax Water Audit and Finance Committee recommend the Board approve the following motion:

1. Approve the financing of $39,988,188 with a thirty-year amortization term and finance over ten years. The maximum all-inclusive rate is not to exceed 6.5%.
2. Approve the re-financing of $10,472,225 with a ten-year amortization term and financing over ten years, with an all-inclusive rate not to exceed 6.5%.

BACKGROUND

Halifax Water is legally required to borrow through the NSFTB. The borrowing proposed in this report is estimated using the Five Year Business Plan, the approved Operating and Capital Budgets for 2023/24, and the rate schedule approved by the Nova Scotia Utility and Review Board.

DISCUSSION

The 2023/24, Operating Budget was prepared based on issuing new debt in the Fall of 2023 of $40.0 million to finance water, wastewater, and stormwater additions to utility plant in service. The $40.0 million will be applied to water, wastewater, and stormwater as follows:

Water	$20.2 million
Wastewater	$14.0 million
Stormwater	$5.8 million

In addition to funding the new capital assets, refinancing of $10.5 million is required in the Fall of 2023 for a balloon payment.

The balloon payment due relates to debt issued in fiscal 2013/14 of $20.9 million which was acquired to fund water, wastewater, and stormwater capital expenditures. There was one debenture issued, for a ten-year term with a twenty-year amortization. The 2013/14 debenture of $20,944,444 issued on November 15, 2013, had an all-in interest rate of 3.05%. Halifax Water's current Weighted Average Cost of Debt is 3.06%.

In the recommendation, Halifax Water uses a rate of 6.5% as recommended by NSFTB. This would be the upper limit that Halifax Water can finance debt. If the actual interest rate is greater than 6.5%, a revised report will be required for the Board. If the actual interest rate is lower than 6.5%, a revised report is not required.

The final interest rates and timing of the debt issues will not be known with certainty until NSFTB 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 18.99% as of March 31, 2023. 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 on March 31, 2023 (including the current portion) was $218.4 million, and debt is projected to be $237.7 million on March 31,2024 assuming the new debt of $40.0M is approved.

BUDGET IMPLICATIONS

The 2023/24 budget includes $29.2 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.

The budget was based on an all-inclusive rate of 4.05% on both new and refinanced debt. The Spring 2023 debenture had an all-inclusive rate of 3.92% and the expectation is the Fall refinancing will be similar.

ALTERNATIVES

1. Halifax Water could choose not to refinance the 2023 Fall balloon payment. This would lower the cash balance by $10.5 million and possibly have a significant impact on the ability to fund capital. For this reason, Halifax Water has chosen to refinance the balloon payment.
2. Halifax Water could choose to finance an amount different than $40.0 million. If Halifax Water chooses to finance $20.0 million of debt, than there would be a savings of $0.3 million of interest and $0.4 million of principal. If Halifax Water chooses to refinance $30.0 million of debt, there would be a savings of $0.14 million of interest and $0.3 million of principal. Even though there are cost savings, the recommendation is to finance $40.0 million.

   Attachment 2 provides a cash flow estimate for the 2023/24 fiscal year. The model estimates capital expenditures for the year to be $100.0 million based on spending patterns and current projects in progress. If expenditures begin to trend higher than projected, Halifax Water would issue additional debt in May 2024.

ATTACHMENTS

1. Borrowing Resolution for $50.5 million of debt.
2. Cash Flow Model for 2023/24 based on approved Operating and Capital Budgets and anticipated cash flow.

Report prepared by: Alicia Scallion
Digitally signed by Alicia Scallion
Date: 2023.09.01 13:11:02 -03'00'
Syed Ahmed, MBA
Manager, Accounting
Phone: 902- 497-2502

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 $10,472,225 for the purpose of refinancing balloon payments for their remaining 10 year amortization period; AND WHEREAS Halifax Water wishes to borrow $39,988,188 for the purpose of financing regular additions to utility plant in service for a 30 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 Nova Scotia Municipal Finance Corporation, for the purpose set forth above, a sum or sums not exceeding $50,460,413 with a Thirty-year amortization term and finance over ten years. The maximum all-inclusive rate is not to exceed 6.5% 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 September 28, 2023.

Heidi Schedler, K.C.
Director of Governance and Human Resources and Corporate Secretary

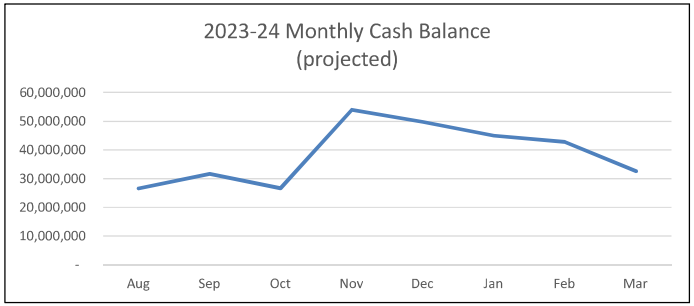
Halifax Water
Cash Flow Model for 2023-24

	2023/24 Budget	Adjustments for Cash Flow	2023/24 Cash Flow	2023/24 Budget Aug	2023/24 Budget Sep	2023/24 Budget Oct	2023/24 Budget Nov	2023/24 Budget Dec	2023/24 Budget Jan	2023/24 Budget Feb	2023/24 Budget Mar
Operating Revenue	168,896,067	-	168,896,067	13,358,132	27,956,612	13,358,132	12,858,132	12,858,132	12,558,132	12,558,132	12,558,132
Operating Expenses	(111,410,652)	9,414,555	(101,996,097)	(8,283,008)	(8,283,008)	(9,583,008)	(8,283,008)	(8,283,008)	(8,283,008)	(8,283,008)	(8,283,008)
Non Operating Revenue	951,032	-	951,032	79,253	79,253	79,253	79,253	79,253	79,253	79,253	79,253
Non Operating Expenses	(70,159,676)	12,380,289	(57,779,387)	(14,583)	(5,840,733)	(14,583)	(18,590,956)	(65,843)	(488,225)	(14,583)	(6,767,216)
Operations Total	(11,723,229)	21,794,844	10,071,615	5,139,794	13,912,124	3,839,794	(13,936,580)	4,588,534	3,866,152	4,339,794	(2,412,840)
Capital Expenditures (incl CCC projects)	(200,000,000)	100,000,000	(100,000,000)	(9,657,227)	(9,657,227)	(9,657,227)	(9,657,227)	(9,657,227)	(9,657,227)	(9,657,227)	(9,657,227)
New Long Term Debt	64,228,354	(481,713)	63,746,641	-	-	-	50,093,682	-	-	-	-
Other Incoming Cash (Build Can, RDC, etc)	11,278,070	-	11,278,070	902,839	902,839	902,839	902,839	902,839	1,050,839	1,050,839	1,050,839
Changes in working capital	-	-	-	-	(100,000)	(50,000)	(50,000)	(50,000)	(50,000)	2,000,000	800,000
Net Cash Flow	(136,216,805)	121,313,131	(14,903,674)	(3,614,595)	5,057,735	(4,964,595)	27,352,715	(4,215,855)	(4,790,237)	(2,266,595)	(10,219,228)
Opening Cash Balance				30,195,000	26,580,406	31,638,141	26,673,546	54,026,261	49,810,406	45,020,169	42,753,575
Ending Cash Balance				26,580,406	31,638,141	26,673,546	54,026,261	49,810,406	45,020,169	42,753,575	32,534,347

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 $100.0 million based on historical patterns
- The new Long Term Debt anticipated in this forecast is for $40.0m in new debt and a $10.5m balloon renewal
- Other Incoming Cash includes $11.3 million in RDC Collections

Opening Cash Balance highlighted in green
Closing Cash Balance highlighted in blue



ITEM # 4.4
Halifax Water Board

September 28, 2023

TO: Colleen Rollings, P.Eng., PMP., Chair and Members of the Halifax Regional Water Commission Board

SUBMITTED BY: Louis de Montbrun (Sep 21, 2023 12:57 ADT)
Louis de Montbrun, CPA, CA, Director, Corporate Services/CFO

APPROVED: Tareq Al-Zabet (Sep 22, 2023 13:51 ADT)
Tareq Al-Zabet, Ph.D., CRSP, P.Geo, CEO & General Manager

DATE: September 8, 2023

SUBJECT: Appointment of Auditors

ORIGIN

The Halifax Water Corporate Governance Manual requires the Halifax Water Board to approve the appointment of auditors.

RECOMMENDATION

It is recommended the Halifax Regional Water Commission Board approve the appointment of Grant Thornton LLP as auditors for the Halifax Regional Water Commission financial statements for the year ended March 31, 2024, and the Halifax Regional Water Commission Employees' Pension Plan for the year ended December 31, 2023.

BACKGROUND

At the September 8, 2023 meeting of the Halifax Water Audit and Finance Committee, the attached report was reviewed and the Committee approved a motion to recommend the Halifax Water Board approve the appointment of Grant Thornton LLP as auditors for the Halifax Regional Water Commission financial statements for the year ended March 31, 2024, and the Halifax Regional Water Commission Employees' Pension Plan for the year ended December 31, 2023.

DISCUSSION

At the meeting of the Audit and Finance Committee the attached report was reviewed and discussed.

ATTACHMENTS

1. Report to the Halifax Water Audit and Finance Committee re. Appointment of Auditors

Report prepared by:

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

ITEM # 9

Halifax Water Audit and Finance Committee

September 8, 2022

TO: Chair, and Members of the Halifax Regional Water Commission Audit and Finance Committee

SUBMITTED BY: A. Scallion on behalf of Louis de Montbrun
Digitally signed by A. Scallion on behalf of Louis de Montbrun
Date: 2023.08.31 17:38:26 -03'00'

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

APPROVED: Tareq Al-Zabet
Digitally signed by Tareq Al-Zabet
Date: 2023.09.01 13:24:26 -03'00'

Tareq Al-Zabet, Ph.D., CRSP, P.Geo
Chief Executive Officer and General Manager

DATE: August 31, 2023

SUBJECT: **Appointment of Auditors**

ORIGIN

The Halifax Water Corporate Governance Manual requires the Halifax Water Board to approve the appointment of auditors.

RECOMMENDATION

It is recommended the Audit and Finance Committee recommend the appointment of Grant Thornton LLP as auditors for the Halifax Regional Water Commission financial statements for the year ended March 31, 2024, and the Halifax Regional Water Commission Employees' Pension Plan for the year ended December 31, 2023.

DISCUSSION

In December 2021, the contract with the existing auditors, Grant Thornton LLP, expired and Halifax Water went through a procurement process to procure external audit services for Halifax Water. The contract was awarded to Grant Thornton LLP for a one-year term, ending December 31, 2022, with an option to renew for four additional one-year terms. This year being the second term for Grant Thornton LLP.

Based on the positive experience with Grant Thornton LLP during the last audits and the competitive contract price for year two of the contract of $54,200, for both entities, it is recommended that Grant Thornton LLP be appointed as auditors for the Halifax Water financial

statements for the year ended March 31, 2024, and the Halifax Regional Water Commission Employees' Pension Plan for the year ended December 31, 2023. The contract price for year two of the contract is set, but there is potential for additional fees due to changes in auditing standards or when additional audit procedures are required.

ALTERNATIVE

Halifax Water could choose to not renew the contract and go back to the market for Audit Services. This approach is not recommended.

Report prepared by: _____

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

ITEM #5

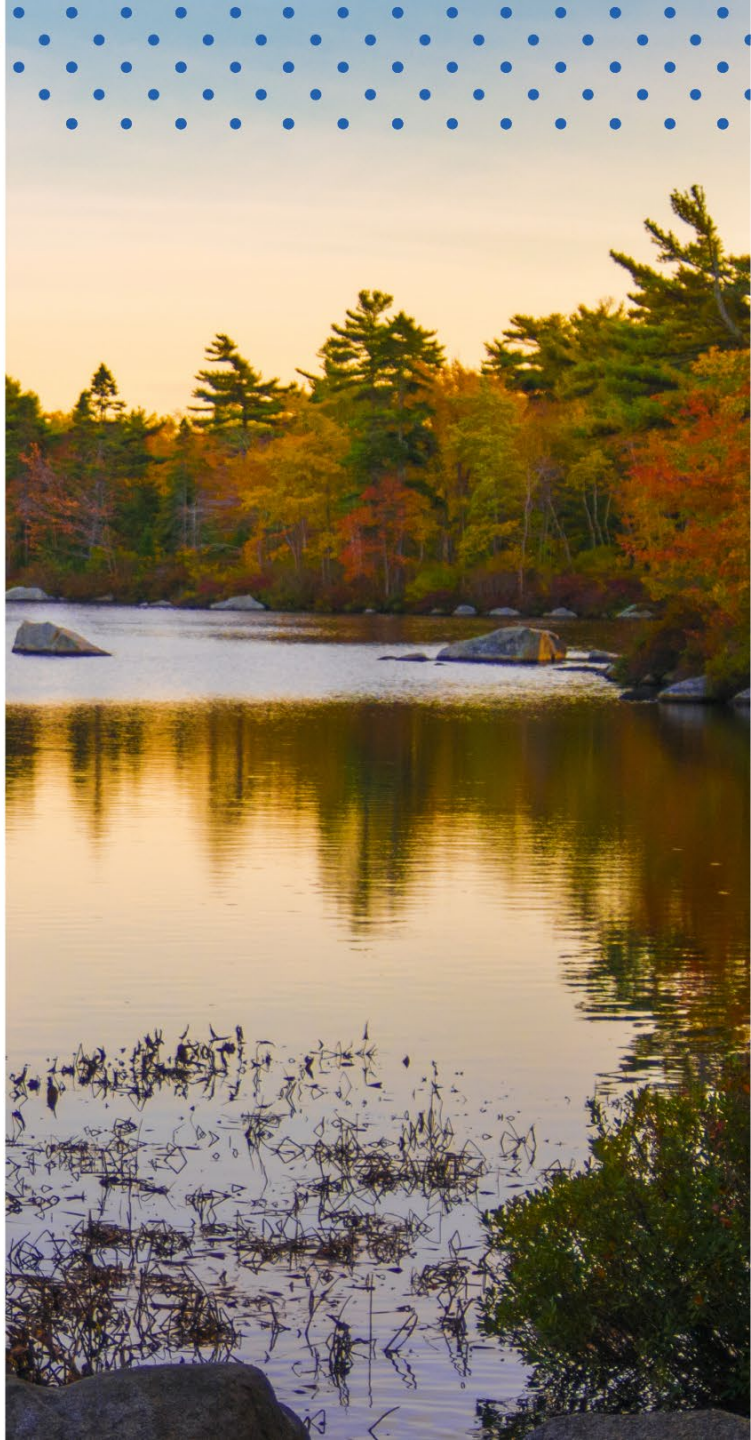
Board Executive Meeting

Flood Update – July 2023

Colin Waddell

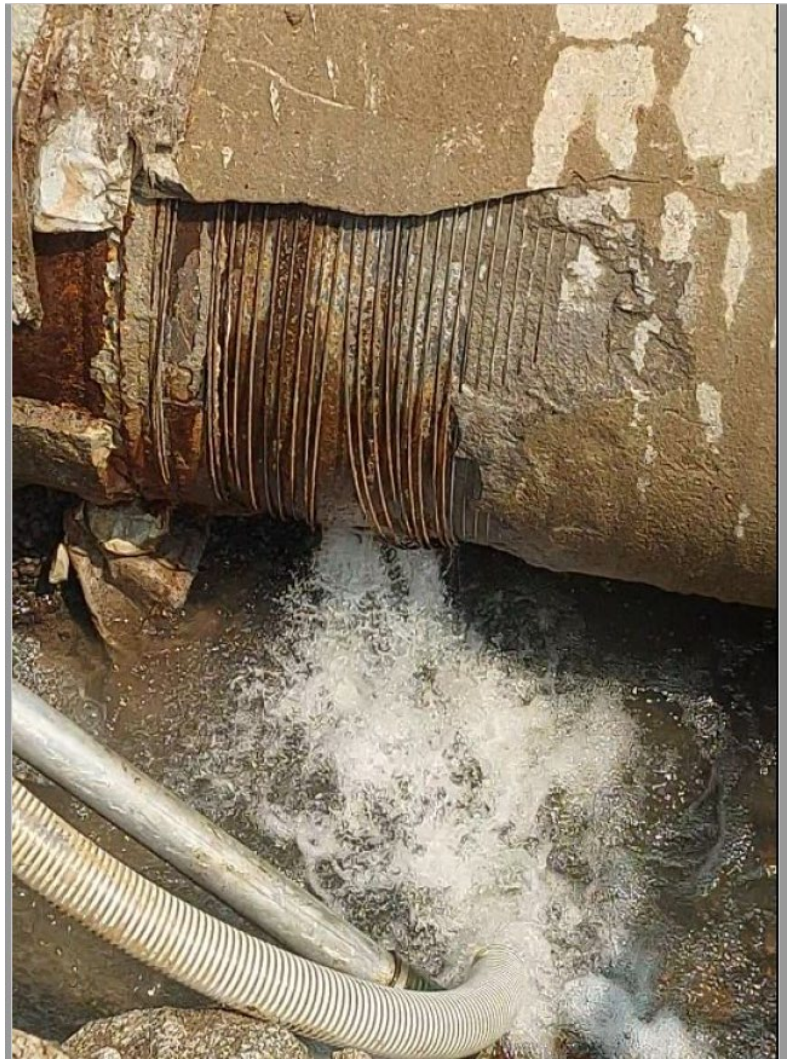
August 2023

STRAIGHT from the SOURCE



Heading into the Friday, July 21, 2023

- ICS was in place to execute the 36” Dunbrack transmission main repair.
- Despite the storm, the repair was completed and the main returned to service on the evening of Saturday, July 23, 2023 securing the water supply for ~25,000 customers



Storm Response

- Due to the significant unexpected storm on Friday, July 21, 2023, Halifax Water dispatched Wastewater and Stormwater emergency crews to respond to the rain event on Friday, July 21, & Saturday, July 22, 2023.
- ICS was expanded to an Area Command in response to the storm and the Dunbrack work.
- ICS began at 0800 hours on Saturday, July 22, 2023 and ended at 0900 hours on Thursday, July 27, 2023.

Flood Impact

Customer Service Center:

- The Call Center went offline during the event. Calls and emails were received from Answer 365 and social media. High level of call volume.

Stormwater Infrastructure:

- Many driveway culverts and shoulders were washed out or damaged.
- Some cross culverts were washed out or damaged.

Pump Stations:

- 75% of the pump stations had issues with power interruptions.
- Damage to the wastewater pump station on Farmer's Dairy Lane in Bedford caused the station to go offline. Applicable federal, provincial, and municipal entities were made aware of this incident.

Flood Impact

Wastewater Treatment:

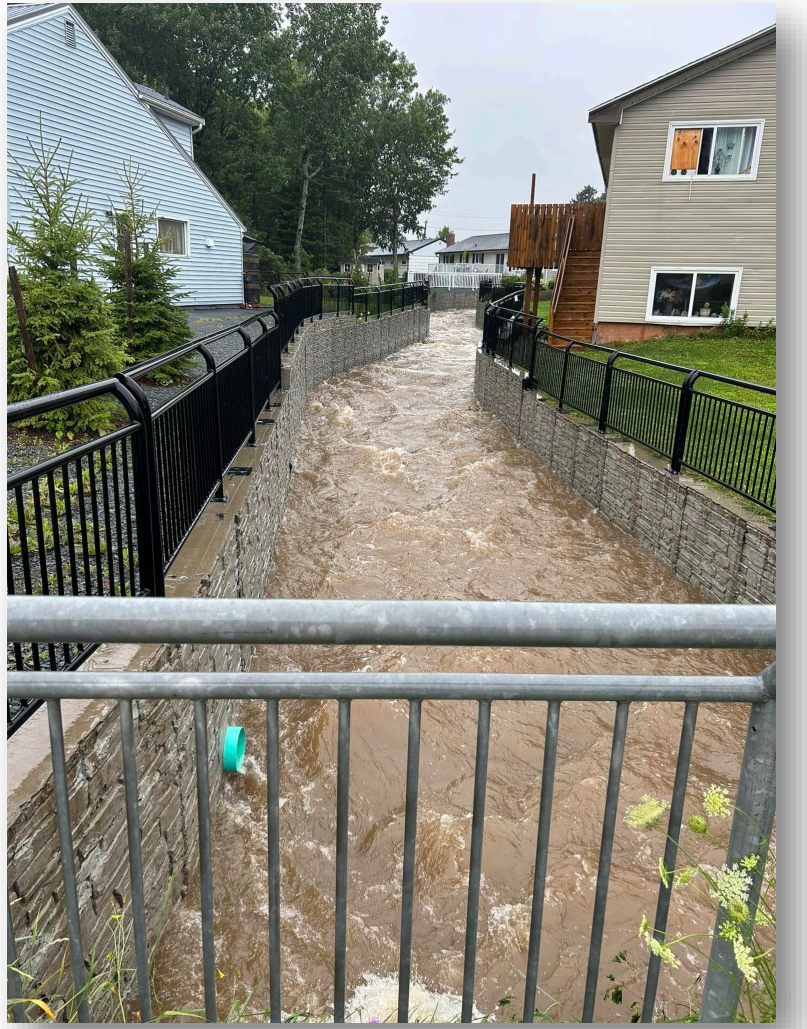
- Some Wastewater Treatment Plants experienced power outages and high flows.
- The Fall River WWTF suffered inundation and erosion at the outlet

Dams:

- The Lake Major and Pockwock saw increase lake levels dams were monitored, consequently moving to enhanced monitoring levels of Blue and Yellow respectfully, as per our procedures.

Water Treatment:

- JD Kline and Lake Major Water Supply Plants experienced notable deterioration to the source water due to runoff and excessive rain.
- Treatment processes had to be adjusted but all compliance and health guidelines were met.



Customer Requests

- Below is a table outlining the number of Customer Requests received by Status and Region as of August 31, 2023.

SUMMARY OF CUSTOMER REQUESTS BY STATUS AND REGION				
WWSW Region	CLOSED	COMPLETE	OPEN	Grand Total
	1			**1**
Central	153	49	67	**269**
East	34		4	**38**
West	50	34	30	**114**
Grand Total	**238**	**83**	**101**	**422**

Customer Requests Outstanding / Completed to-date (Aug 31, 2023)		
Outstanding requests has a status of Open	101	# of Outstanding customer requests
Completed requests have a status of Complete, Closed	321	# of Completed customer requests

Work Orders

- Below is a table outlining the number of Work Orders by Status and Region as of August 31, 2023.

SUMMARY OF WORK ORDERS BY STATUS AND REGION						
WWSW Region	**APPROVED**	**CLOSED**	**COMPLETE**	**OPEN**	**PENDING**	**Grand Total**
	1					1
Central	97	410	13	22	25	567
East		25			1	26
West	19	106	65	24	39	253
Grand Total	**117**	**541**	**78**	**46**	**65**	**847**

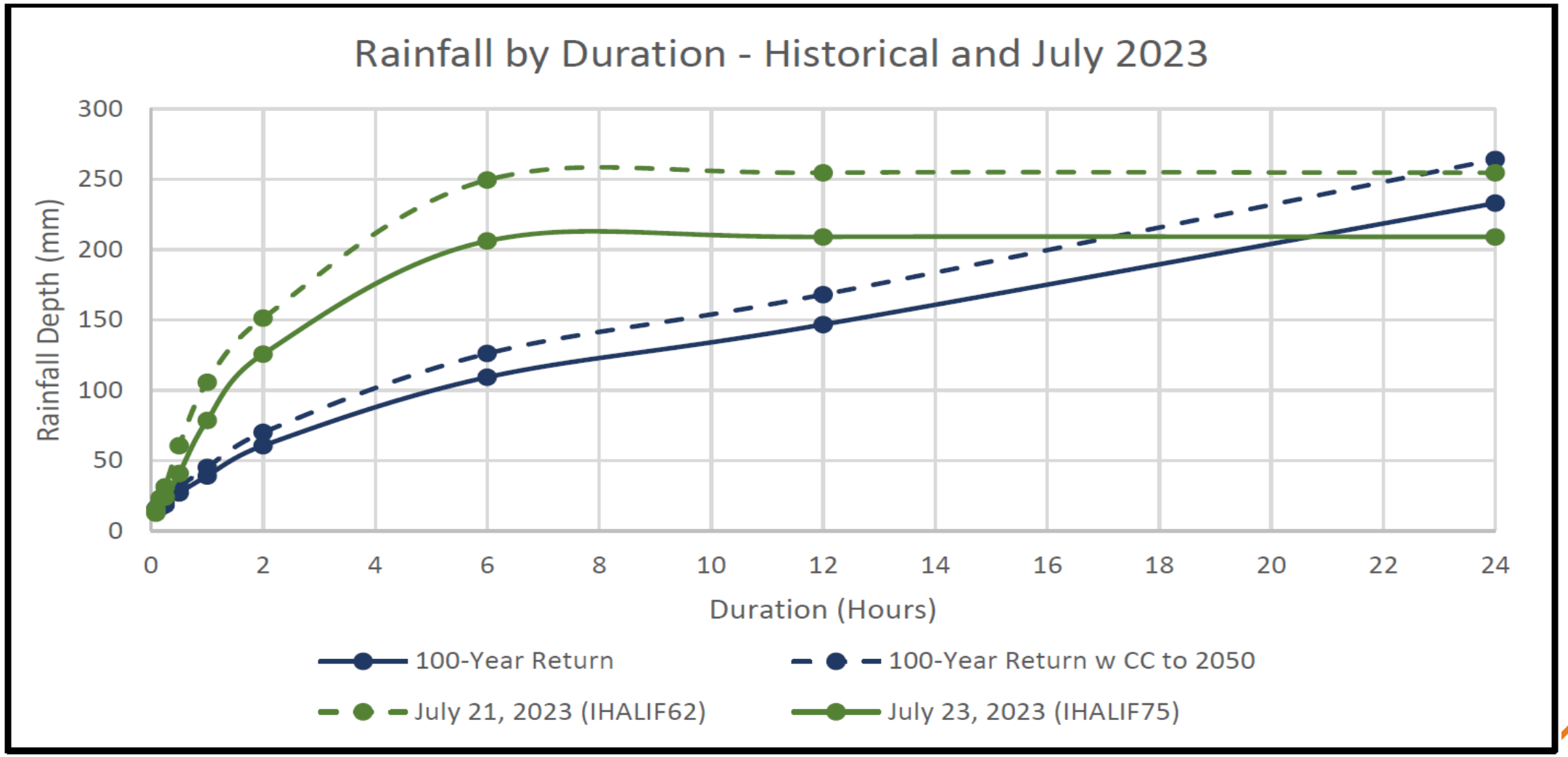
Work Outstanding / Completed to-date (Aug 31, 2023)		
Outstanding work has a Status = Open, Pending, Approved	228	# Outstanding Work Orders
Completed work has a Status = Complete, Closed	619	# of Completed Work Orders

Non–Emergency Drainage Calls

- Over 700 non-emergency drainage inquiries:
  - Flooded backyards
  - Overland flow impacts (gravel washouts on private property)
  - Overtopping of Ditches & Culverts (designed for 1 in 5 year, we saw over 1 in 250 year)
  - Requests for increasing infrastructure sizes

- Importance of calls/emails going to Customer Care Centre for triage and prioritization
  - Will be revisiting the intake and escalation process to ensure inquiries are managed/not duplicated
  - Resource needs to manage volume and levels of service

Storm Magnitude



Post Storm Cleanup

- Over 800 Cityworks work orders were created in response to the flash flooding event.
- A list was generated of all required repairs that could be completed.
- Crews responded to assess the damage and complete repairs.
- Contractors were engaged for repairs that could be completed immediately.
- Major repairs were identified that required emergency locates and the locate process was initiated.

Where Are We Now?

- Currently there are approximately 12 large cross culverts projects that are being managed by the Engineering and Operations team. This list is being updated on a daily/weekly basis.
- There were **181 driveway culverts replaced in the first week** following the storm thus restoring access to the properties of our customers.
- Operations crew continue to manage the lower priority issues such as culvert cleaning and minor driveway repairs that are left on their lists.
- All WWTF are back online and compliant.
- The regional Water Supply Plants continue to deal the after effects of the source water changes.
- Post Storm inspection were carried out on all dam structures with no findings reported.
- Duplication of effort is a risk as requests are still arriving via multiple channels out with CCC.


Questions

ITEM #6
Halifax Water Board

September 28, 2023

TO: Colleen Rollings, P.Eng., PMP., Chair and Members of the Halifax Regional Water Commission Board

SUBMITTED BY: Louis de Montbrun (Sep 21, 2023 14:08 ADT)
Louis de Montbrun, CPA, CA, Director, Corporate Services/CFO

APPROVED: Tareq Al-Zabet (Sep 22, 2023 13:51 ADT)
Tareq Al-Zabet, Ph.D., CRSP, P.Geo, CEO & General Manager

DATE: September 8, 2023

SUBJECT: Capital Project Spending Summary – 2022/23

ORIGIN

Nova Scotia Utility and Review Board (NSUARB) requirement for reconciliation of Capital Budget expenditures.

RECOMMENDATION

It is recommended the Halifax Water Board to approve for filing with the NSUARB the capital project spending summary for the period April 1, 2022, to March 31, 2023, and the capital project spending over $1,000,000 summary for the period April 1, 2022, and March 31, 2023.

BACKGROUND

At the September 8, 2023 meeting of the Halifax Water Audit and Finance Committee, the attached report was reviewed and the Committee approved a motion for filing with the NSUARB the capital project spending summary for the period April 1, 2022, to March 31, 2023, and the capital project spending over $1,000,000 summary for the period April 1, 2022, and March 31, 2023.

DISCUSSION

At the Audit and Finance Committee the attached report was reviewed and discussed and motion approved.

ATTACHMENTS

1. Report to the Halifax Water Audit and Finance Committee re. Capital Project Spending Summary – 2022/23

Report prepared by:

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

ITEM # 8

Halifax Water Audit and Finance Committee
September 8, 2023

TO: Chair and Members of the Halifax Regional Water Commission Audit and Finance Committee

SUBMITTED BY: Digitally signed by Reid Campbell
Date: 2023.09.01 11:33:47 -03'00'

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

APPROVED: Tareq Al-Zabet Digitally signed by Tareq Al-Zabet
Date: 2023.09.01 13:23:55 -03'00'

Tareq Al-Zabet, Ph.D., CRSP, P. Geo
Chief Executive Officer and General Manager

DATE: August 24, 2023

SUBJECT: **Capital Project Spending Summary – 2022/23**

ORIGIN

Nova Scotia Utility and Review Board (NSUARB) requirement for reconciliation of Capital Budget expenditures.

BACKGROUND

The Halifax Water Board approves an annual Capital Budget for capital projects. The specific funding for individual projects is further approved by the General Manager, Halifax Water Board, and the NSUARB as required based on total project cost, as per the Capital Funding Approval Policy.

RECOMMENDATION

It is recommended the Halifax Water Audit and Finance Committee recommend to the Halifax Water Board to approve for filing with the NSUARB the capital project spending summary for the period April 1, 2022, to March 31, 2023, and the capital project spending over $1,000,000 summary for the period April 1, 2022, and March 31, 2023.

DISCUSSION

During the 2022/23 fiscal year, a series of capital projects were completed, placed in service, and "closed out" from a fiscal work order perspective. These projects were funded from the 2022/23 Capital Budget, previous years' capital budgets for projects with multi-year delivery timelines, and surpluses from previously closed projects or projects that have been deferred or cancelled. Approvals for projects drawing funding from the surpluses were obtained in accordance with the Capital Funding Approval Policy.

The first attached report entitled, "Capital Spending Summary - April 1, 2022 - March 31, 2023", identifies all capital projects funded from the Halifax Water Capital Budget that were completed prior to March 31, 2023. For water projects, the total expenditure for these completed projects totals $35,584,867 with an aggregate net surplus of $3,915,556 (9.91%) relative to the total funding approvals. For wastewater projects, the total expenditure for these completed projects totals $22,578,703, with an aggregate net deficit of $2,151,997 (8.70%). For stormwater projects, the total expenditure for these completed projects totals $6,091,069, with an aggregate net deficit of $1,298,804 (27.10%).

The second attached report entitled, "Capital Project Spending Summary – Projects Over $1,000,000, April 1, 2022, to March 31, 2023", identifies all capital projects funded from the Halifax Water Capital Budget that were completed prior to March 31, 2023, and required specific NSUARB approval based on the $1,000,000 threshold. For water projects, the total expenditure for these completed projects totals $19,380,181, with an aggregate net surplus of $548,819. For wastewater projects, the total expenditure for these completed projects totals $12,137,528, with an aggregate net surplus of $549,672.

Halifax Water's Capital Funding Policy requires all material funding increases for capital projects to be approved at the time of the funding need. This process promotes fiscal accountability and improves management of available funds. It should be noted that the threshold for NSUARB approval increased from $250,000 to $1,000,000 on October 30, 2019.

The net surpluses will be utilized as a capital funding source in future years, and for funding adjustment to projects as required, subject to the required Halifax Water Board and NSUARB approvals.

ATTACHMENTS

Attachment 1 - Capital Project Spending Summary, April 1, 2022 – March 31, 2023

Attachment 2 - Capital Project Spending over $1,000,000, April 1, 2022 - March 31, 2023

Report Prepared By: Alicia Scallion
Digitally signed by Alicia Scallion
Date: 2023.09.01 10:59:09 -03'00'

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

Financial Review By: A. Scallion on behalf of Louis de Montbrun
Digitally signed by A. Scallion on behalf of Louis de Montbrun
Date: 2023.09.01 10:59:20 -03'00'

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

Project Number	Project Name	NSUARB Approval Date	NSUARB Matter Number	Amount Spent: Cumulative to March 31/23	Project Budget	Over Budget	(Under Budget)
300002352	LM WSP Waste Residuals Mgmt Study	N/A	N/A	$ 55,979.51	$ 78,000.00	$ -	$ (22,020.49)
300002589	CHLORINE STORAGE ROOM-SYS MODIFICATIONS	N/A	N/A	$ 46,313.20	$ 70,000.00	$ -	$ (23,686.80)
300002732	BEDFORD SOUTH (HEMLOCK) RESERVOIR CCC	28-May-20	M09697	$ 8,162,478.65	$ 8,410,000.00	$ -	$ (247,521.35)
300002738	JDK REPL EXIST TRANSFORMER IN LIFT STN	N/A	N/A	$ 16,505.04	$ 26,000.00	$ -	$ (9,494.96)
300002743	JDK UPGRADES TO PROCESS WW LAGOONS	N/A	N/A	$ 58,757.39	$ 200,000.00	$ -	$ (141,242.61)
300002752	LM CLARIFIER REPAIR	14-Jun-21	M10078/M10570	$ 2,264,889.32	$ 2,260,000.00	$ 4,889.32	$ -
300002784	REPLACE CC MGMT (TELEPHONY) 18/19	N/A	N/A	$ 440,461.62	$ 210,000.00	$ 230,461.62	$ -
300002923	LAKE MAJOR DAM MONITORING PROGRAM	N/A	N/A	$ 27,956.28	$ 120,000.00	$ -	$ (92,043.72)
300002924	ROBIE 2 EMERGENCY PUMP METER INSTALL	N/A	N/A	$ 129,792.45	$ 120,000.00	$ 9,792.45	$ -
300002931	UPGRADE THE PLC-JDK	N/A	N/A	$ 706,976.72	$ 612,000.00	$ 94,976.72	$ -
300002976	REGULATORY REPORTING	N/A	N/A	$ 967,424.90	$ 996,723.00	$ -	$ (29,298.10)
300002978	MOBILE DEVICES AND APPLICATIONS	N/A	N/A	$ 371,413.50	$ 336,000.00	$ 35,413.50	$ -
300002985	GIS DATA PROJECT	N/A	N/A	$ 489,512.74	$ 489,000.00	$ 512.74	$ -
300002991	VULNERABILITY TO CLIMATE CHANGE-PILOT	N/A	N/A	$ 217,832.50	$ 213,000.00	$ 4,832.50	$ -
300003020	GIS UPDATING FOR CLOSED WORK ORDERS 1920	N/A	N/A	$ 87,237.61	$ 87,000.00	$ 237.61	$ -
300003021	RECORD DRAWINGS FOR CLOSED WOs 1920	N/A	N/A	$ 26,945.00	$ 26,945.00	$ -	$ -
300003134	AUTOMATED FLUSHING PROGRAM	N/A	N/A	$ 18,006.31	$ 20,000.00	$ -	$ (1,993.69)
300003137	WATER SAMPLING STN RELOCATION PROGRAM	N/A	N/A	$ 42,647.11	$ 10,000.00	$ 32,647.11	$ -
300003143	BEDFORD SOUTH (HEMLOCK) RESERVOIR CCC	N/A	N/A	$ -	$ 2,000,000.00	$ -	$ (2,000,000.00)
300003157	JDK - NEW ULTRASONIC LEVEL TRANSMITTER	N/A	N/A	$ 2,316.19	$ 10,000.00	$ -	$ (7,683.81)
300003158	JDK - REPLACE FLOC TANK VALVE ACTUATORS	N/A	N/A	$ 40,531.81	$ 35,000.00	$ 5,531.81	$ -
300003166	LM - NEW BOAT LAUNCH	N/A	N/A	$ 44,067.39	$ 42,000.00	$ 2,067.39	$ -
300003169	LM - ROOF REPLACEMENT	N/A	N/A	$ 549,039.95	$ 525,000.00	$ 24,039.95	$ -
300003176	PUMP REPLACEMENT PROG - SM SYSTEMS	N/A	N/A	$ 22,878.92	$ 45,000.00	$ -	$ (22,121.08)
300003210	SAP RATE STRUCTURE SUPPORT	N/A	N/A	$ 183,536.52	$ 183,800.00	$ -	$ (263.48)
300003214	GIS DATA PROGRAM 2020/21	N/A	N/A	$ 262,738.19	$ 263,000.00	$ -	$ (261.81)
300003215	GIS DATA BUILD - SERVICES (ICI)	N/A	N/A	$ 117,553.08	$ 118,055.00	$ -	$ (501.92)
300003216	SEWER SERVICE ENTRY	N/A	N/A	$ 507,128.92	$ 550,000.00	$ -	$ (42,871.08)
300003225	TM RISK ASSESS/PRIORITIZAION FRAMEWORK	N/A	N/A	$ 42,077.18	$ 50,000.00	$ -	$ (7,922.82)
300003239	BURNSIDE TO BEDFORD CONNECTOR TM-DESIGN	4-Nov-21	M10304/M10490	$ 1,818,795.20	$ 1,723,000.00	$ 95,795.20	$ -
300003240	ICIP CANDIDATE CLIMATE CHNG RESIL ASSESS	N/A	N/A	$ 60,809.88	$ 137,000.00	$ -	$ (76,190.12)
300003241	COVID 19 - COMPUTER EQUIPMENT	N/A	N/A	$ 213,398.80	$ -	$ 213,398.80	$ -
300003244	GREEN ACRES WATER RD MAIN RENEWAL	N/A	N/A	$ -	$ 230,000.00	$ -	$ (230,000.00)
300003288	HARBOURVIEW DR 20/21 WM RENEWAL PRE-LIM	N/A	N/A	$ 834,420.96	$ 865,000.00	$ -	$ (30,579.04)
300003294	IRVING STREET 20/21 WM RENEWAL IP 21/22	N/A	N/A	$ 627,401.31	$ 576,000.00	$ 51,401.31	$ -
300003296	PHOENIX CRES 20/21 WM RENEWAL	N/A	N/A	$ 862,810.32	$ 875,000.00	$ -	$ (12,189.68)
300003298	WINDGATE DRIVE TM EXTENSION- DESIGN	28-May-21	M10082	$ 1,968,614.72	$ 2,190,000.00	$ -	$ (221,385.28)
300003301	ST. MICHAEL'S AVE WM UPSIZING	N/A	N/A	$ 897,701.60	$ 965,000.00	$ -	$ (67,298.40)
300003302	SOUTH PARK/CATHEDRAL LANE WM RENEWAL	N/A	N/A	$ 68,897.10	$ 279,000.00	$ -	$ (210,102.90)
300003326	CONDITION ASSESSMENT - COBEQUID RD TM	N/A	N/A	$ 180,010.04	$ 250,000.00	$ -	$ (69,989.96)
300003328	CHAIN CONTROL VALVE PROGRAM - 21/22	N/A	N/A	$ 32,271.11	$ 33,400.00	$ -	$ (1,128.89)
300003329	COMPUTER REPLACEMENT PROGRAM 21/22	N/A	N/A	$ 400,000.00	$ 400,000.00	$ -	$ -
300003330	GENERAL ANALYTIC TOOL	N/A	N/A	$ 205,205.22	$ 190,000.00	$ 15,205.22	$ -
300003335	NETWORK UPGRADES 21/22	N/A	N/A	$ 268,426.22	$ 280,000.00	$ -	$ (11,573.78)
300003341	AUTOMATED FLUSHING PROGRAM 20/21	N/A	N/A	$ 7,122.87	$ 20,000.00	$ -	$ (12,877.13)
300003342	WATER SAMPLING STN RELOCATION PROG 21/22	N/A	N/A	$ 8,560.37	$ 10,000.00	$ -	$ (1,439.63)
300003345	DMA - METER REPLACEMENT PROGRAM	N/A	N/A	$ 59,184.30	$ 57,000.00	$ 2,184.30	$ -
300003348	CONDITION ASSESSMENT-MISC STRUCTURES	N/A	N/A	$ 79,021.15	$ 75,000.00	$ 4,021.15	$ -
300003383	MID MUSQUODOBOIT - PUMPING SYS UPGRADES	N/A	N/A	$ -	$ 250,000.00	$ -	$ (250,000.00)
300003404	ASSET RENEWAL STRATEGIES OPTIMIZATION	N/A	N/A	$ 57,513.44	$ 30,000.00	$ 27,513.44	$ -
300003405	ASSET RENEWAL MGMT PROGRAM REPORTING	N/A	N/A	$ 3,857.74	$ 15,000.00	$ -	$ (11,142.26)
300003414	LONG-TERM PLANNING FRAMEWORK REVIEW	N/A	N/A	$ -	$ 20,000.00	$ -	$ (20,000.00)
300003416	ANNUAL UNIT RATES RENIEW	N/A	N/A	$ -	$ 10,000.00	$ -	$ (10,000.00)
300003417	RDC PROGRAMM IMPLEMENTATION	N/A	N/A	$ -	$ 600,000.00	$ -	$ (600,000.00)
300003418	ANNUAL MODEL CALIBRATION REPORT	N/A	N/A	$ 10,611.29	$ 10,000.00	$ 611.29	$ -
300003422	BACKUP SUPPLY FEASIBILITY STUDY	N/A	N/A	$ 1,998.97	$ 50,000.00	$ -	$ (48,001.03)
300003424	ROBIE EMERGENCY BOOSTER ASSESSMENT	N/A	N/A	$ 1,306.70	$ 25,000.00	$ -	$ (23,693.30)
300003432	GIS DATA PROJ (CAD SCHEMATIC RETIREMENT)	N/A	N/A	$ 157,602.24	$ 150,000.00	$ 7,602.24	$ -
300003435	GIS DATA MODELLING	N/A	N/A	$ 90,000.00	$ 90,000.00	$ -	$ -
300003446	FLUSHING LINE INSTALLATION PROGRAM	N/A	N/A	$ 9,231.73	$ 50,000.00	$ -	$ (40,768.27)
300003466	HEATHER/ELGIN/DEKKER WM	N/A	N/A	$ 793,962.95	$ 747,000.00	$ 46,962.95	$ -
300003467	DUBLIN STREET WM	30-May-22	M10591	$ 2,228,378.84	$ 2,100,000.00	$ 128,378.84	$ -
300003468	TRINITY AVE WATERMAIN WM	N/A	N/A	$ 685,971.35	$ 605,000.00	$ 80,971.35	$ -
300003469	OSBOURNE AVE WM	N/A	N/A	$ 429,526.60	$ 421,000.00	$ 8,526.60	$ -
300003471	MAPLE STREET WM	N/A	N/A	$ 220,213.19	$ 225,000.00	$ -	$ (4,786.81)
300003472	BIRCHDALE AVE WM	N/A	N/A	$ 311,700.09	$ 295,000.00	$ 16,700.09	$ -
300003478	ANDERSON ST WM REN'L	11-May-22	M10551	$ 1,138,827.36	$ 1,323,000.00	$ -	$ (184,172.64)
300003481	PURCHASE OF VALVE MAINTENANCE TRAILER	N/A	N/A	$ 60,089.76	$ 77,000.00	$ -	$ (16,910.24)
300003482	i20 PRESSURE MANAGEMENT PILOT PROJECT	N/A	N/A	$ 12,523.56	$ 15,000.00	$ -	$ (2,476.44)
300003523	LARRY UTECK PRV RETROFIT	N/A	N/A	$ 131,459.76	$ 89,000.00	$ 42,459.76	$ -
300003524	MT EDWARD RD PRV RETROFIT (PRE-LIM)	N/A	N/A	$ 65,451.69	$ 66,000.00	$ -	$ (548.31)
300003528	MT EDWARD 1 RESERVIOR CONSULTING SERVICE	N/A	N/A	$ 24,290.87	$ 15,000.00	$ 9,290.87	$ -
300003530	BENNERY LAKE PARKING LOT & ROAD IMPROVEM	N/A	N/A	$ 17,599.40	$ 15,000.00	$ 2,599.40	$ -
300003535	AZURE GIS PROJECT	N/A	N/A	$ 22,951.88	$ 35,000.00	$ -	$ (12,048.12)
300003541	BONFIRE IMPLEMENTATION & PIA	N/A	N/A	$ 21,037.58	$ 35,000.00	$ -	$ (13,962.42)
300003542	STRUCTURAL LINING PROGRAM - DESIGN	N/A	N/A	$ 50,340.30	$ 75,000.00	$ -	$ (24,659.70)
300003551	CONDITION ASSESS - MISC STRUCTURES 22/23	N/A	N/A	$ 26,886.41	$ 75,000.00	$ -	$ (48,113.59)
300003552	ASSET MANAGEMENT PLAN UPDATE 22/23	N/A	N/A	$ 9,701.47	$ 10,000.00	$ -	$ (298.53)
300003554	ANNUAL UNIT RATES REVIEW 22/23	N/A	N/A	$ -	$ 10,000.00	$ -	$ (10,000.00)
300003555	MODEL UPDATE AND CALIBRATION	N/A	N/A	$ 65,344.92	$ 75,000.00	$ -	$ (9,655.08)
300003577	WSEP - CONTINUATION PILOTING DAF CLARIF	N/A	N/A	$ 355,495.56	$ 325,000.00	$ 30,495.56	$ -
300003578	Computer Replacement Program 22/23	N/A	N/A	$ 397,113.26	$ 400,000.00	$ -	$ (2,886.74)
300003592	Explore Intelligent Water 22/23	N/A	N/A	$ 22,535.45	$ 20,000.00	$ 2,535.45	$ -
300003603	FUELTANK REMOV-LEIBLIN PARKDALE ROCKMNOR	N/A	N/A	$ 29,983.26	$ 50,000.00	$ -	$ (20,016.74)

Project Number	Project Name	NSUARB Approval Date	NSUARB Matter Number	Amount Spent: Cumulative to March 31/23	Project Budget	Over Budget	(Under Budget)
300003604	LAKE LEMONT BACKUP - HAZMAT ASSESS/REMOV	N/A	N/A	$ 1,486.05	$ 90,000.00	$ -	$ (88,513.95)
300003606	STARBOARD DR PRV CHAMBER - CSE RETROFIT	N/A	N/A	$ 133,147.77	$ 89,000.00	$ 44,147.77	$ -
300003607	GEIZER 123 RESERVOIR REHABILITATION	N/A	N/A	$ -	$ 200,000.00	$ -	$ (200,000.00)
300003612	LAKE MAJOR - HVAC LOW LOFT PUMP STN	N/A	N/A	$ 14,744.58	$ 36,000.00	$ -	$ (21,255.42)
300003619	WSP PLANTS - INSTR & CONTROL EQUIP PRGRM	N/A	N/A	$ 105,633.09	$ 100,000.00	$ 5,633.09	$ -
300003620	PUMP & EQUIPMENT OVERHAULS PROG FOR WSPS	N/A	N/A	$ 248,793.49	$ 200,000.00	$ 48,793.49	$ -
300003622	SECURITY UPGRADE PROGRAM W 22/23	N/A	N/A	$ 52,292.63	$ 50,000.00	$ 2,292.63	$ -
300003633	Intelligent Water GIS Initiatives 22/23	N/A	N/A	$ -	$ 50,000.00	$ -	$ (50,000.00)
300003635	GPS Units - Replacement 22/23	N/A	N/A	$ 38,419.65	$ 45,000.00	$ -	$ (6,580.35)
300003641	Customer Meters 22/23	N/A	N/A	$ 275,670.31	$ 530,000.00	$ -	$ (254,329.69)
300003644	VALVE RENEWALS 22/23	N/A	N/A	$ 498,078.40	$ 200,000.00	$ 298,078.40	$ -
300003647	HYDRANT RENEWALS 22/23	N/A	N/A	$ 51,878.80	$ 75,000.00	$ -	$ (23,121.20)
300003649	SERVICE LINES RENEWALS 22/23	N/A	N/A	$ 167,916.85	$ 100,000.00	$ 67,916.85	$ -
300003652	LEAD SL REPL PROG 22/23	6-Jun-22	M10506	$ 1,798,197.23	$ 1,923,000.00	$ -	$ (124,802.77)
300003681	450 & 455 COWIE - LIGHTING CONTROLS	N/A	N/A	$ 18,206.83	$ 50,000.00	$ -	$ (31,793.17)
300003702	TOC ANALYZER FOR BENNERY LAKE WSP	N/A	N/A	$ 56,715.10	$ 60,000.00	$ -	$ (3,284.90)
300003722	CITYWORKS SSO AND MOBILITY	N/A	N/A	$ 22,582.04	$ 25,000.00	$ -	$ (2,417.96)
300003723	JDK - RAW WATER INTAKE TRAVELING SCREEN	N/A	N/A	$ 16,654.02	$ 12,500.00	$ 4,154.02	$ -
300003921	Port Wallace TM - Additional Costs	N/A	N/A	$ 135,293.41	$ -	$ 135,293.41	$ -
Water Capital Difference				**$ 35,584,867.04**	**$ 39,500,423.00**	**$ 1,838,366.20**	**$ (5,753,922.16)**
						Net Water	***$ (3,915,555.96)***

Project Number	Project Name	NSUARB Approval Date	NSUARB Matter Number	Amount Spent: Cumulative to March 31/23	Project Budget	Over Budget	(Under Budget)
600000328	RUSSELL LAKE PUMPING STN UPGRADE	26-Mar-21	M10038	$ 1,818,351.17	$ 1,970,000.00	$ -	$ (151,648.83)
600000383	WINDMILL RD PUMPING STATION	26-Aug-20	M09786	$ 1,458,533.54	$ 1,430,000.00	$ 28,533.54	$ -
600001695	ROACH'S POND PS COMPONENT UPGRADE	7-Jan-19	M08992	$ 1,059,729.29	$ 925,457.46	$ 134,271.83	$ -
600002023	MORRIS LAKE PS - FORCEMAIN INVESTIGATION	12-Jan-21	M09929	$ 2,901,545.52	$ 3,000,000.00	$ -	$ (98,454.48)
600002026	ALLISON DR PS - COVER REPLACEMENT	N/A	N/A	$ 9,605.25	$ 50,000.00	$ -	$ (40,394.75)
600002070	JAMIESON PS - AUTOMATIC BAR SCREEN	N/A	N/A	$ 253,906.91	$ 900,000.00	$ -	$ (646,093.09)
600002072	BRUCE ST PS RELOCATION	18-May-21	M10068	$ 1,509,500.23	$ 1,400,000.00	$ 109,500.23	$ -
600002180	CHRICHTON PS ELIMINATION	N/A	N/A	$ -	$ 25,000.00	$ -	$ (25,000.00)
600002222	BARRINGTON ST STORM SEWER	N/A	N/A	$ 266,086.32	$ 270,000.00	$ -	$ (3,913.68)
600002252	MANHOLE RENEWALS WW WEST 21/22	N/A	N/A	$ 49,474.20	$ 11,000.00	$ 38,474.20	$ -
600002253	MANHOLE RENEWALS WW EAST 21/22	N/A	N/A	$ 12,112.73	$ 10,000.00	$ 2,112.73	$ -
600002254	MANHOLE RENEWALS WW CENTRAL 21/22	N/A	N/A	$ -	$ 10,000.00	$ -	$ (10,000.00)
600002255	LATERAL REPL WW (non tree roots) WEST	N/A	N/A	$ 692,972.87	$ 600,000.00	$ 92,972.87	$ -
600002256	LATERAL REPL WW (non tree roots) EAST	N/A	N/A	$ 409,161.46	$ 600,000.00	$ -	$ (190,838.54)
600002257	LATERAL REPL WW (non tree roots) CENTRAL	N/A	N/A	$ 161,182.58	$ 550,000.00	$ -	$ (388,817.42)
600002258	LATERAL REPL WW (tree roots) WEST 21/22	N/A	N/A	$ 310,269.17	$ 200,000.00	$ 110,269.17	$ -
600002259	LATERAL REPL WW (tree roots) EAST 21/22	N/A	N/A	$ 171,272.65	$ 200,000.00	$ -	$ (28,727.35)
600002260	LATERAL REPL WW (tree roots) CTRL 21/22	N/A	N/A	$ 16,403.54	$ 155,000.00	$ -	$ (138,596.46)
600002261	WET WEATHER MANAGEMENT PROGRAM 21/22	N/A	N/A	$ 183,355.81	$ 350,000.00	$ -	$ (166,644.19)
600002264	HARBOURVIEW DR SEWER MAIN RENEWAL-IP	N/A	N/A	$ 763,168.10	$ 760,000.00	$ 3,168.10	$ -
600002275	PUMPING STN OIL TANK REPLACEMENTS	N/A	N/A	$ 17,981.31	$ 60,000.00	$ -	$ (42,018.69)
600002276	EMERGENCY PS PUMP REPLACEMENTS 21/22	N/A	N/A	$ 88,625.27	$ 250,000.00	$ -	$ (161,374.73)
600002277	WW PS COMPONENT REPL PROG WEST 21/22	N/A	N/A	$ 208,082.71	$ 184,542.54	$ 23,540.17	$ -
600002284	CSO UPGRADE PROGRAM 21/22	N/A	N/A	$ 217,984.58	$ 300,000.00	$ -	$ (82,015.42)
600002291	HWWTF-FINE SCREENS-REPL W PLATE SCREENS	1-Apr-21	M10045	$ 1,743,096.33	$ 1,750,000.00	$ -	$ (6,903.67)
600002326	BLTWWTF - ASSET RENEWAL PROGRAM	N/A	N/A	$ 85,507.65	$ 100,000.00	$ -	$ (14,492.35)
600002338	SECURITY PROGRAM WW 21/22	N/A	N/A	$ 140,514.43	$ 200,000.00	$ -	$ (59,485.57)
600002340	MISC EQUIPMENT REPLACEMENT WW 21/22	N/A	N/A	$ 112,832.06	$ 120,000.00	$ -	$ (7,167.94)
600002344	CORPORATE FLOW MONITORING PROGRAM 21/22	16-Aug-21	M10188	$ 1,521,662.93	$ 1,937,200.00	$ -	$ (415,537.07)
600002349	LIDS / SUDS STUDY	N/A	N/A	$ -	$ 50,000.00	$ -	$ (50,000.00)
600002364	IRVING ST WW IP 21/22	N/A	N/A	$ 239,164.02	$ 300,000.00	$ -	$ (60,835.98)
600002369	ST. MICHAEL'S AVE WW IP 21/22	N/A	N/A	$ 47,783.43	$ 44,000.00	$ 3,783.43	$ -
600002400	AEROTECH WWTF - CENTRATE DIVERSION	N/A	N/A	$ 544,572.34	$ 500,000.00	$ 44,572.34	$ -
600002403	KEARNEY LAKE PS - WET WELL WIZARD	N/A	N/A	$ 39,531.89	$ 37,500.00	$ 2,031.89	$ -
600002405	ANDERSON STREET WW IP 22/23	N/A	N/A	$ 100,713.78	$ 91,000.00	$ 9,713.78	$ -
600002409	OSBORNE AVENUE WW IP 22/23	N/A	N/A	$ 213,367.30	$ -	$ 213,367.30	$ -
600002410	TRINITY AVENUE WW IP 22/23	N/A	N/A	$ 259,645.16	$ 260,000.00	$ -	$ (354.84)
600002414	HEATHER STREET WW IP 22/23	N/A	N/A	$ 90,582.04	$ 90,000.00	$ 582.04	$ -
600002450	CORPORATE FLOW MONITORING 22/23	31-Oct-22	M10770	$ 1,184,837.97	$ 1,200,000.00	$ -	$ (15,162.03)
600002452	WW SEWER CONDITION ASSESSMENT 22/23	N/A	N/A	$ 303,460.48	$ 285,000.00	$ 18,460.48	$ -
600002457	5368 Inglis Street Roof Replacement	N/A	N/A	$ 70,315.48	$ 70,000.00	$ 315.48	$ -
600002492	Upper Water Street CSO - Screen Rebuild	N/A	N/A	$ 62,653.17	$ 110,000.00	$ -	$ (47,346.83)
600002503	Raw Water Pump Refurbishment	N/A	N/A	$ 90,533.76	$ 55,000.00	$ 35,533.76	$ -
600002505	Wet Well - Stop Log Lifting System	N/A	N/A	$ 29,669.38	$ 50,000.00	$ -	$ (20,330.62)
600002508	HWWTF Chemical Storage Area -Epoxy Floor	N/A	N/A	$ 43,236.61	$ 50,000.00	$ -	$ (6,763.39)
600002512	AHU Intake Heating Coil Replacement	N/A	N/A	$ 45,084.97	$ 55,000.00	$ -	$ (9,915.03)
600002513	AHU Fan Timing Belts	N/A	N/A	$ 16,498.09	$ 30,000.00	$ -	$ (13,501.91)
600002514	DWWTF Garage Door Replacement	N/A	N/A	$ 34,231.88	$ 50,000.00	$ -	$ (15,768.12)
600002516	Hypo Storage Tank	N/A	N/A	$ -	$ 20,000.00	$ -	$ (20,000.00)
600002520	HCWWTF Garage Door Refurbishment	N/A	N/A	$ 15,830.92	$ 30,000.00	$ -	$ (14,169.08)
600002521	HCWWTF Chem Storage Areas-Epoxy Floors	N/A	N/A	$ 19,065.57	$ 30,000.00	$ -	$ (10,934.43)
600002522	Chemical Storage Area Upgrades	N/A	N/A	$ 64,118.31	$ 75,000.00	$ -	$ (10,881.69)
600002528	Headworks Splitter Box Valve Actuators	N/A	N/A	$ 26,021.50	$ 35,000.00	$ -	$ (8,978.50)
600002529	New Yard Tractor	N/A	N/A	$ 10,794.71	$ 12,000.00	$ -	$ (1,205.29)
600002532	Spare Centrifuge Conveyor Gear Box	N/A	N/A	$ 7,522.01	$ 10,000.00	$ -	$ (2,477.99)
600002533	Headworks Compressor & Air Dryer Replace	N/A	N/A	$ 13,264.07	$ 20,000.00	$ -	$ (6,735.93)
600002535	Carbon Scrubbers - Media Replacement	N/A	N/A	$ 81,177.82	$ 80,000.00	$ 1,177.82	$ -
600002546	Video Nozzle - Sewer Jet	N/A	N/A	$ 14,130.92	$ 37,000.00	$ -	$ (22,869.08)
600002547	Manhole Renewals WW-West	N/A	N/A	$ 32,763.19	$ 20,000.00	$ 12,763.19	$ -
600002548	Manhole Renewals WW-East	N/A	N/A	$ 40,881.49	$ 20,000.00	$ 20,881.49	$ -
600002550	Lateral Replace WW (non-tree roots) WEST	N/A	N/A	$ 861,428.99	$ 861,000.00	$ 428.99	$ -
600002551	Lateral Replace WW (non-tree roots) EAST	N/A	N/A	$ 804,002.28	$ 793,000.00	$ 11,002.28	$ -
600002552	Lateral Replace WW (non-tree roots) CENT	N/A	N/A	$ 130,554.08	$ 131,000.00	$ -	$ (445.92)
600002553	Lateral Replacement WW (tree roots)-West	N/A	N/A	$ 413,859.16	$ 410,000.00	$ 3,859.16	$ -
600002554	Lateral Replacement WW (tree roots)-East	N/A	N/A	$ 75,831.09	$ 150,000.00	$ -	$ (74,168.91)
600002555	Lateral Replacement WW (tree roots)-Cent	N/A	N/A	$ 6,829.69	$ 10,000.00	$ -	$ (3,170.31)
600002560	AEROTECH - LIVE BOTTOM BIN AUGER REPL	N/A	N/A	$ 99,353.61	$ 60,000.00	$ 39,353.61	$ -
600002565	PHOENIX CRESCENT WW IP	N/A	N/A	$ 208,894.73	$ 217,000.00	$ -	$ (8,105.27)
600002570	MAPLE ST WW IP 22/23	N/A	N/A	$ 4,441.73	$ 10,000.00	$ -	$ (5,558.27)
600002581	HALIFAX WWTF - RW PUMPS - REPL IMPELLERS	N/A	N/A	$ 49,136.71	$ 54,000.00	$ -	$ (4,863.29)
	Wastewater Capital Difference			**$ 22,578,702.94**	**$ 24,730,700.00**	**$ 960,669.88**	**$ (3,112,666.94)**
						Net Wastewater	***$ (2,151,997.06)***

Project Number	Project Name	NSUARB Approval Date	NSUARB Matter Number	Amount Spent: Cumulative to March 31/23	Project Budget	Over Budget	(Under Budget)
700000142	UPPER WATER STREET STORM WATER DRAINAGE	N/A	N/A	$ -	$ 76,000.00	$ -	$ (76,000.00)
700001540	DAHLIA/TULIP/OAK SW IP	N/A	N/A	$ 121,349.68	$ 144,000.00	$ -	$ (22,650.32)
700001545	MANHOLE RENEWALS SW WEST 21/22	N/A	N/A	$ -	$ 6,000.00	$ -	$ (6,000.00)
700001546	MANHOLE RENEWALS SW EAST 21/22	N/A	N/A	$ -	$ 5,000.00	$ -	$ (5,000.00)
700001547	MANHOLE RENEWALS SW CENTRAL 21/22	N/A	N/A	$ -	$ 5,000.00	$ -	$ (5,000.00)
700001548	CATCHBASIN RENEWALS SW WEST 21/22	N/A	N/A	$ 55,998.35	$ 21,000.00	$ 34,998.35	$ -
700001549	CATCHBASIN RENEWALS SW EAST 21/22	N/A	N/A	$ 7,681.73	$ 21,000.00	$ -	$ (13,318.27)
700001550	CATCHBASIN RENEWALS SW EAST 21/22	N/A	N/A	$ 51,108.63	$ 21,000.00	$ 30,108.63	$ -
700001551	LATERAL REPLACEMENTS SW WEST 21/22	N/A	N/A	$ -	$ 9,000.00	$ -	$ (9,000.00)
700001552	LATERAL REPLACEMENTS SW EAST 21/22	N/A	N/A	$ -	$ 8,000.00	$ -	$ (8,000.00)
700001553	LATERAL REPLACEMENTS SW CENTRAL 21/22	N/A	N/A	$ 2,553.15	$ 8,000.00	$ -	$ (5,446.85)
700001564	SW PIPE CONDITION INSPECTIONS	N/A	N/A	$ 2,421.22	$ 50,000.00	$ -	$ (47,578.78)
700001566	DRIVEWAY CULVERT REPL - 21/22 EAST	N/A	N/A	$ 183,530.11	$ 200,000.00	$ -	$ (16,469.89)
700001567	DRIVEWAY CULVERT REPL - 21/22 WEST	N/A	N/A	$ 402,596.14	$ 300,000.00	$ 102,596.14	$ -
700001568	DRIVEWAY CULVERT REPL - 21/22 CENTRAL	N/A	N/A	$ 829,532.22	$ 500,000.00	$ 329,532.22	$ -
700001571	BETTY DR, near civic 1	N/A	N/A	$ 412,733.88	$ 350,000.00	$ 62,733.88	$ -
700001572	ROBERT LANE, near civic 10	N/A	N/A	$ 544,013.20	$ 350,000.00	$ 194,013.20	$ -
700001573	YANKEETOWN RD, near civic 16	N/A	N/A	$ 943,954.24	$ 350,000.00	$ 593,954.24	$ -
700001581	CULVERT REPL-LUCASVILLE near YANKEETOWN	N/A	N/A	$ 594,086.28	$ 350,000.00	$ 244,086.28	$ -
700001588	ASSET MGMT IMPL TEAM-SW MGMT STRUCTURES	N/A	N/A	$ -	$ 50,000.00	$ -	$ (50,000.00)
700001605	IRVING ST SW IP 21/22	N/A	N/A	$ 22,675.05	$ 35,000.00	$ -	$ (12,324.95)
700001608	HARBOURVIEW DR SW IP 21/22	N/A	N/A	$ 45,269.69	$ 46,000.00	$ -	$ (730.31)
700001661	CROSS ROAD CULVERT RENEWALS - OPERATIONS	N/A	N/A	$ 42,055.19	$ -	$ 42,055.19	$ -
700001662	ANDERSON STREET SW IP 22/23	N/A	N/A	$ 91,424.58	$ 60,000.00	$ 31,424.58	$ -
700001666	TRINITY AVENUE SW IP 22/23	N/A	N/A	$ 30,768.91	$ 30,000.00	$ 768.91	$ -
700001668	PHOENIX CRESCENT SW IP 22/23	N/A	N/A	$ 60,557.14	$ 63,000.00	$ -	$ (2,442.86)
700001701	STORM SEWER CONDITION ASSESSMENT 22/23	N/A	N/A	$ 125,722.50	$ 125,000.00	$ 722.50	$ -
700001712	1 CAMBRIDGE COURT	N/A	N/A	$ 9,675.39	$ 30,000.00	$ -	$ (20,324.61)
700001718	BUNDY LANE, NEAR CIVIC 79	N/A	N/A	$ 15,111.60	$ 66,000.00	$ -	$ (50,888.40)
700001719	PARKWAY DR AT ATHOLEA DR.	N/A	N/A	$ 13,531.52	$ 65,000.00	$ -	$ (51,468.48)
700001722	SEABREEZE DR AT CALDWELL RD.	N/A	N/A	$ 10,673.30	$ 94,000.00	$ -	$ (83,326.70)
700001730	MANHOLE RENEWALS SW 22/23 -WEST	N/A	N/A	$ -	$ 6,000.00	$ -	$ (6,000.00)
700001731	MANHOLE RENEWALS SW 22/23 - EAST	N/A	N/A	$ -	$ 5,000.00	$ -	$ (5,000.00)
700001732	MANHOLE RENEWALS SW 22/23 - CENTRAL	N/A	N/A	$ -	$ 5,000.00	$ -	$ (5,000.00)
700001733	CATCHBASIN RENEWALS SW 22/23 - WEST	N/A	N/A	$ 10,265.63	$ 21,000.00	$ -	$ (10,734.37)
700001734	CATCHBASIN RENEWALS SW 22/23 - EAST	N/A	N/A	$ -	$ 21,000.00	$ -	$ (21,000.00)
700001735	CATCHBASIN RENEWALS SW 22/23 - CENTRAL	N/A	N/A	$ 10,890.43	$ 23,000.00	$ -	$ (12,109.57)
700001736	LATERAL REPLACEMENTS SW 22/23 - WEST	N/A	N/A	$ 8,937.13	$ 8,000.00	$ 937.13	$ -
700001737	LATERAL REPLACEMENTS SW 22/23 - EAST	N/A	N/A	$ 10,265.63	$ 18,265.63	$ -	$ (8,000.00)
700001738	LATERAL REPLACEMENTS SW 22/23 -CENTRAL	N/A	N/A	$ -	$ 9,000.00	$ -	$ (9,000.00)
700001739	DRIVEWAY CULVERT REPLACEMENTS - WEST	N/A	N/A	$ 497,377.88	$ 400,000.00	$ 97,377.88	$ -
700001740	DRIVEWAY CULVERT REPLACEMENTS - EAST	N/A	N/A	$ 343,876.03	$ 250,000.00	$ 93,876.03	$ -
700001741	DRIVEWAY CULVERT REPLACEMENTS - CENTRAL	N/A	N/A	$ 527,183.47	$ 550,000.00	$ -	$ (22,816.53)
700001764	OSBORNE AVENUE SW IP	N/A	N/A	$ 26,723.71	$ -	$ 26,723.71	$ -
700001770	MAPLE ST SW IP 22/23	N/A	N/A	$ 36,525.73	$ 38,000.00	$ -	$ (1,474.27)
Stormwater Capital Difference				**$ 6,091,069.34**	**$ 4,792,265.63**	**$ 1,885,908.87**	**$ (587,105.16)**
						Net Stormwater	***$ 1,298,803.71***

Net Difference	**$ 64,254,639.32**	**$ 69,023,388.63**	**$ 4,684,944.95**	**$ (9,453,694.26)**
			Net Total	***$ (4,768,749.31)***

Capital Project Spending Summary

April 1, 2022 - March 31, 2023

ITEM # 10
HRWC BOARD
September 28, 2023
ATTACHMENT 2

Item	Project Number	Project Name	NSUARB Approval Date	Amount Spent: Cumulative to March 31/23	Total Project Budget	Project Adjustments	Revised Total Project Budget	Over Budget	(Under Budget)
1	300002732	BEDFORD SOUTH (HEMLOCK) RESERVOIR CCC	28-May-20	$8,162,478.65	$8,410,000.00	$ -	$ 8,410,000.00	$ -	$ (247,521.35)
2	300002752	LM CLARIFIER REPAIR	14-Jun-21	$2,264,889.32	$1,530,000.00	$ 730,000.00	$ 2,260,000.00	$ 4,889.32	$ -
3	300003239	BURNSIDE TO BEDFORD CONNECTOR TM-DESIGN	4-Nov-21	$1,818,795.20	$1,723,000.00	$ -	$ 1,723,000.00	$ 95,795.20	$ -
4	300003298	WINDGATE DRIVE TM EXTENSION- DESIGN	28-May-21	$1,968,614.72	$2,500,000.00	$ (310,000.00)	$ 2,190,000.00	$ -	$ (221,385.28)
5	300003467	DUBLIN STREET WM	30-May-22	$2,228,378.84	$2,100,000.00	$ -	$ 2,100,000.00	$ 128,378.84	$ -
6	300003478	ANDERSON ST WM REN'L	11-May-22	$1,138,827.36	$1,172,000.00	$ 151,000.00	$ 1,323,000.00	$ -	$ (184,172.64)
7	300003652	LEAD SL REPL PROG 22/23	6-Jun-22	$1,798,197.23	$2,000,000.00	$ (77,000.00)	$ 1,923,000.00	$ -	$ (124,802.77)
		Water Capital Difference		**$ 19,380,181.32**	**$ 19,435,000.00**	**$ 494,000.00**	**$ 19,929,000.00**	**$ 229,063.36**	**$ (777,882.04)**
							Net Water	***$***	***(548,818.68)***
8	600000328	RUSSELL LAKE PUMPING STN UPGRADE	26-Mar-21	$1,818,351.17	$2,140,000.00	$ (170,000.00)	$ 1,970,000.00	$ -	$ (151,648.83)
9	600000383	WINDMILL RD PUMPING STATION	26-Aug-20	$1,458,533.54	$1,430,000.00	$ -	$ 1,430,000.00	$ 28,533.54	$ -
10	600002023	MORRIS LAKE PS - FORCEMAIN INVESTIGATION	12-Jan-21	$2,901,545.52	$3,050,000.00	$ (50,000.00)	$ 3,000,000.00	$ -	$ (98,454.48)
11	600002072	BRUCE ST PS RELOCATION	18-May-21	$1,509,500.23	$1,530,000.00	$ (130,000.00)	$ 1,400,000.00	$ 109,500.23	$ -
12	600002291	HWWTF-FINE SCREENS-REPL W PLATE SCREENS	1-Apr-21	$1,743,096.33	$1,750,000.00	$ -	$ 1,750,000.00	$ -	$ (6,903.67)
13	600002344	CORPORATE FLOW MONITORING PROGRAM 21/22	16-Aug-21	$1,521,662.93	$1,937,200.00	$ -	$ 1,937,200.00	$ -	$ (415,537.07)
14	600002450	CORPORATE FLOW MONITORING 22/23	31-Oct-22	$1,184,837.97	$1,200,000.00	$ -	$ 1,200,000.00	$ -	$ (15,162.03)
		Wastewater Capital Difference		**$ 12,137,527.69**	**$ 13,037,200.00**	**$ (350,000.00)**	**$ 12,687,200.00**	**$ 138,033.77**	**$ (687,706.08)**
							Net Wastewater	***$***	***(549,672.31)***

TO: Colleen Rollings, P.Eng., PMP., Chair, and Members of the Halifax Regional Water Commission Board

SUBMITTED BY:

Colin Waddell, CEng MIET, CMgr MCMI, MIoL, Acting Director, Operations

Kenda MacKenzie
Kenda MacKenzie (Sep 20, 2023 12:19 ADT)

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

Cindy MacLean, Supervisor, Human Resources

APPROVED:

Tareq Al-Zabet (Sep 22, 2023 13:52 ADT)

Tareq Al-Zabet, Ph.D., CRSP, P.Geo, CEO & 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.

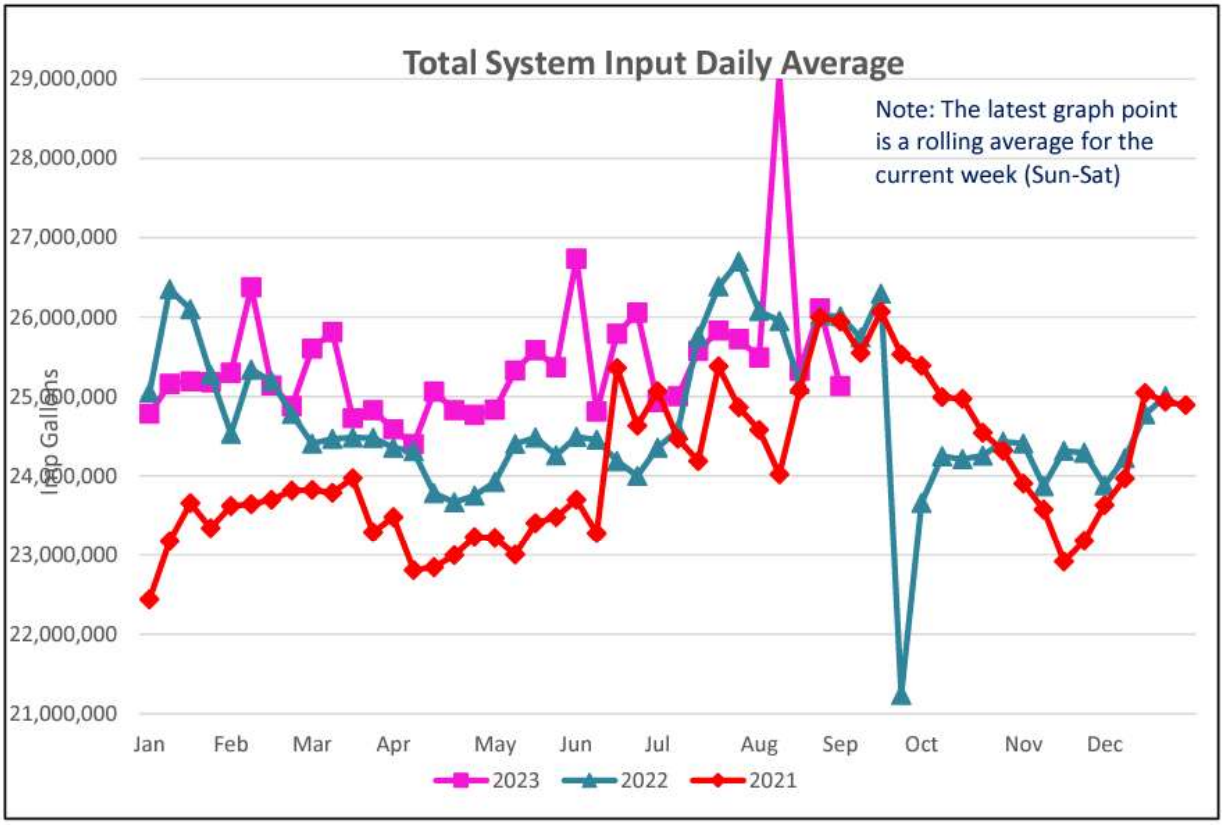
SAFETY STATISTICS – April 1, 2023 to June 30, 2023

The data in the table below is presented at the Environmental, Health, and Safety Board Sub-Committee.

Organizational Metrics	**Q1** **Apr 1 - Jun 30**	**CBS Target** **2023-24**
Lost Time Incident Reporting (LTIR) (Lost Time Cases x 200,000 / Total Employee Hours Worked)	1.85	3
Safe Driving (Number of traffic accidents per 1,000,000 km driven)	3.97	4
Workplace inspections conducted	54	Score
Safety Talks conducted (reported at the end of each quarter)	22%	85%
High Potential/Near Miss	21	N/A
Employees on accommodation or gradual return to work	12	N/A
WCB claims	4	N/A
Work refusals	0	N/A
Incidents with written compliance orders	0	0-2
Employees trained or recertified before due date	222	85%
• Courses Taken	441	N/A

* Percentage Data generated at year end due to variants in system data (ie. multiple certifications required for one employee)

AVERAGE DAILY WATER PRODUCTION



* The decrease from the end of September/beginning of October 2022 is due to the system being out for a significant amount of time during Fiona resulting in data gaps.

Regional Water Main Break/Leak Data		
Year	**Total Breaks/Leaks**	**Current 12 Month Rolling Total *(up to July 2023)***
2022/23	176	**183**
2021/22	232	
2020/21	179	
2019/20	191	
2018/19	226	
Total	**1004**	
Yr. Avg.	**200.8**	

Water Accountability
Losses per Service Connection/Day (International Water Association Standard)
Period Ending June 30, 2023
Real Losses: 248 litres CBS Target: 160 - 170

COMPLIANCE SUMMARY

Water Safety Plan Objectives 2023-2024 Q1				
Objective	Total Sites	% Sites Achieving Target	All Sites: 90th Percentile < 15 µg/L	CBSC Awarded Points
Disinfection	63	100%	---	20
Total Trihalomethanes	25	92%	---	13
Haloacetic Acids	21	100%	---	20
Particle Removal	5	100%	---	20
Corrosion Control	101	---	2.8	20
Summary Total				93

Score: 93/100

Bacteriological Results (% Samples absent of Total Coliforms) 99.76%

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 Monthly Compliance Summary

Wastewater Treatment Facility	April-23								May-23								June-23								Toxicity
	$CBOD_5$ (mg/L)		TSS (mg/L)		E. coli (counts/ 100mL)		pH		$CBOD_5$ (mg/L)		TSS (mg/L)		E. coli (counts/ 100mL)		pH		$CBOD_5$ (mg/L)		TSS (mg/L)		E. coli (counts/ 100mL)		pH		
	NSECC Limit	Avg.	NSECC Limit	Avg.	NSECC Limit	Avg.	NSECC Limit	Avg.	NSECC Limit	Avg.	NSECC Limit	Avg.	NSECC Limit	Avg.	NSECC Limit	Avg.	NSECC Limit	Avg.	NSECC Limit	Avg.	NSECC Limit	Avg.	NSECC Limit	Avg.	
Halifax	50	65	40	74	5000	0*	6-9	7.0	50	58	40	56	5000	72,779	6-9	7.0	50	44	40	46	5000	18,696	6-9	7.0	Not acutely lethal
Dartmouth	50	51	40	28	5000	0*	6-9	6.7	50	50	40	17	5000	105	6-9	6.8	50	39	40	14	5000	21	6-9	6.8	Not acutely lethal
Herring Cove	50	25	40	17	5000	0*	6-9	6.8	50	24	40	16	5000	20	6-9	6.7	50	23	40	17	5000	23	6-9	7.0	Not acutely lethal
Eastern Passage	25	8	25	10	200	0*	6-9	7.1	25	7	25	8	200	38	6-9	7.2	25	8	25	10	200	73	6-9	7.1	Not acutely lethal
Mill Cove	25	15	25	15	200	14	6-9	6.7	25	13	25	15	200	12	6-9	6.6	25	9	25	6	200	23	6-9	6.6	Not acutely lethal

* E.coli is not measured during Seasonal Disinfection November 1 to April 30 (except HCWWTF December 25 to January 2).

Wastewater Treatment Facility Quarterly Compliance Summary
April, May, June 2023

Wastewater Treatment Facility	$CBOD_5$ (mg/L)		TSS (mg/L)		E. coli (counts/ 100mL)		pH		Ammonia (mg/L)		Phosphorous (mg/L)		TRC (mg/L)		Dissolved Oxygen (mg/L)		Toxicity
	NSECC Limit	Avg.	NSECC Limit	Avg.	NSECC Limit	Avg.	NSECC Limit	Avg.	NSECC Limit	Avg.	NSECC Limit	Avg.	NSECC Limit	Avg.	NSECC Limit	Avg.	
Springfield	20	4	20	8	200	16	6-9	6.8	-		-		-		-		-
Frame	20	2	20	1	200	10	6-9	7.2	-		-		-		-		-
Middle Musq.	20	15	20	9	200	100	6-9	7.3	-		-		-		-		-
Uplands	20	10	20	11	200	13	6-9	6.8	-		-		-		-		-
Aerotech	5	3	5	1	200	10	6-9	7.0	5.7 W 1.2 S	0.1	0.13	0.09	-		6.5	7.8	Not acutely lethal
North Preston	10	3	10	2	200	14	6-9	6.9	3	0.1	1.5	0.5	-		-		-
Lockview	20	5	20	10	200	22	6.5-9	6.9	8.0 S	8.7	1.2 S	0.3	-		-		-
Steeves (Wellington)	20	2	20	2	200	10	6.5-9	6.9	14.4 S	0.1	1.0 S	0.1	-		-		-
BLT	15	5	20	15	200	13	6-9	6.9	5 W 3 S	2	3 W 1 S	1	0.02 *	0.10	-		Not acutely lethal

NOTES & ACRONYMS:
$CBOD_5$ - Carbonaceous 5-Day Biochemical Oxygen Demand
TSS - Total Suspended Solids
* TRC - Total Residual Chlorine - Bureau Veritas 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

LEGEND
NSECC Compliant
NSECC Non-Compliant

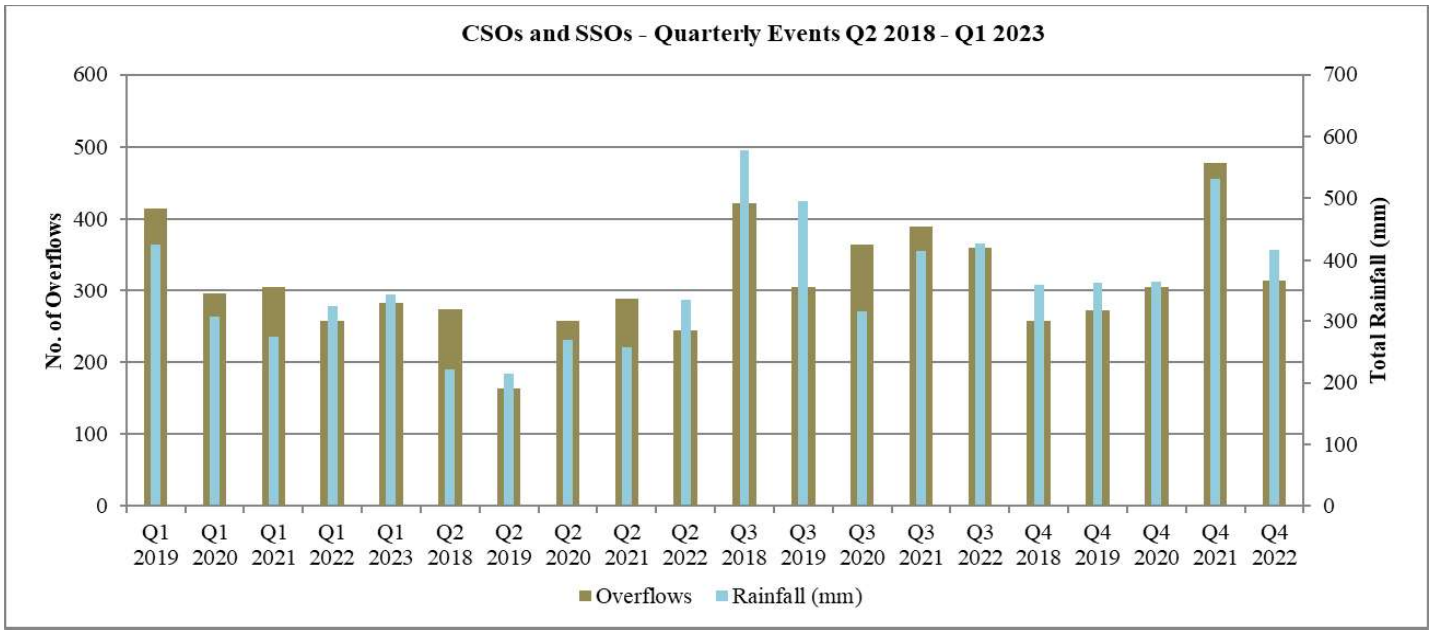
NSECC requires monthly averages be less than the NSECC Compliance Limit for each parameter at Dartmouth, E'n Passage, Halifax, Herring Cove, Mill Cove
NSECC requires quarterly averages be less than the NSECC Compliance Limit for each parameter at Aerotech, Lockview, Middle Musquodoboit, Frame, BLT, Uplands and Springfield Lake
NSECC requires annual averages be less than the NSECC Compliance Limit for each parameter at North Preston and Steeves

NON-COMPLIANCE EXPLANATIONS:

Halifax WWTF: From April 3 to June 16 the facility was operating under a Temporary Bypass Authorization (TBA) issued by Environment Canada to facilitate planned work.

Dartmouth WWTF: At times in April, increased levels of influent BOD were observed at the facility. The Dartmouth WWTF is not designed to treat these increased levels of influent soluble BOD resulting in higher effluent cBOD values.

Lockview: Washout of nitrifying bacteria during high flow events late in the quarter. These bacteria are required for ammonia reduction. Recovery underway in early July.



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 seventeen overflows in Q1 beginning on days when there was no recorded rainfall, as follows:

1. April 11: The CSO at Lyle St CSO was due to a blockage caused by debris.
2. April 19: The CSO at Pier A PS & CSO was due to rain on the previous day. The CSO at Upper Water St CSO was due to a combination of rain on the previous day and a contractor's pump failure.
3. April 20: The CSOs at Upper Water St CSO were due to a contractor's pump failure.
4. April 21: The CSO at Upper Water St CSO was due to a contractor's pump failure.
5. June 7: The CSO at Duffus St PS & CSO and the SSO at Herring Cove PS were due to rain on the previous day.
6. June 8: The CSOs at Upper Water St CSO were due to an influx of flow in the system from an unknown source. The SSOs at Herring cove PS were due to rain on a previous day.
7. June 9: The CSO at Upper Water St CSO was due to a blockage caused by debris.
8. June 21: The CSOs at Chain Rock PS & CSO were due to a communications failure.

ITEM # 2-I
Halifax Water Board
September 28, 2023

Halifax Water Compliance Statement
Quarterly Certification

For the period of April 1, 2023 to June 30, 2023

We hereby certify that the Halifax Regional Water Commission is current in making all statutory remittances for payroll taxes, Harmonized Sales Tax and other remittances as required under the laws of the Government of Canada and its Provinces (the significant remittances are noted in the appendix) and that all significant legal claims have been disclosed.

Tareq Al-Zabet (Sep 22, 2023 13:51 ADT)

Tareq Al-Zabet, Ph.D., CRSP, P.Geo
CEO and General Manager

Louis de Montbrun (Sep 21, 2023 12:57 ADT)

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

Heidi Schedler
Director, Governance and Human Resources

Dated:

September 20, 2023

Halifax Water Compliance Statement
Quarterly Certification
Appendix I

Significant statutory remittances for payroll taxes, Harmonized Sales Tax and other remittances as required under the laws of the Government of Canada and its Provinces for the Halifax Regional Water Commission.

Statutory Payroll Remittances

- **Canada Revenue Agency (CRA) -** Statutory employee payroll deductions and employer related contributions for:
  - Income Tax
  - Canada Pension Plan (CPP)
  - Employment Insurance (EI)

- **Workers' Compensation Board of Nova Scotia (WCB)** – Employer remittance based on employee payroll

Other Payroll Remittances

- **Northern Trust -** Employee payroll deductions and employer contributions to Halifax Water and HRM defined benefit pension plans

- **Industrial Alliance** – employer and employee contributions to defined contribution pension plan

- **Medavie Blue Cross & SSQ** – employee payroll deductions and employer related contributions for Health & dental, LTD, and Life benefit coverage, and payroll deductions for AD&D

- **Canadian Union of Public Employees** – Employee payroll deductions of union dues
  - CUPE Local 227
  - CUPE Local 1431

HST and Other Remittances

- **Canada Revenue Agency (CRA) -** Harmonized Sales Tax (HST) is filed online and a refund issued as HST paid is greater than HST collected

- **Workers' Compensation Board of Nova Scotia (WCB)** – Remittance for sub-contractors

ITEM # 2-I
HRWC BOARD
September 28, 2023

Quarterly Remittance Certification

Appendix II

Period: **April to June** **2023/2024**

Vendor	Vendor #	Items Remitted	Total remitted	Exceptions
Statutory Payroll Remittances				
CRA	174	Tax, CPP, EI, WCB	$4,025,249.48	
Other Payroll				
Northern Trust	1215	HW Pension Plan	$ 2,253,761.59	
Northern Trust	1216	HRM Pension Plan	$ 231,556.94	
Manulife Financial	1171	Bedford Pension Plan	$ 2,187.64	
Industrial Alliance	2971	DCPP	$ -	
Medavie Blue Cross	340, 3101	Health, Dental, Life, LTD	$ 1,013,606.53	
SSQ Insurance	429	AD&D	$ 5,644.29	
CUPE	160	Union Dues 1431	$ 50,702.97	
CUPE	3517	Union Dues 227	$ 79,677.88	
HST and Other				
CRA	N/A	HST (refunds)	$ (2,984,436.35)	
Receiver General	210	WCB subcontractors	$ 76.35	

Other payroll items remitted in accordance with stated requirements:

United Way, Credit Union, Garnishments (WCB, CRA, Family Court, Sherriff's Office), Water for People, Salvation Army, Racially Visible Caucus

Exceptions, errors and/or late remittances

Annual Report

March 31, 2023

2022/23

Halifax Water

Get in Touch

24-Hour Emergency Line &
Customer Care Centre:
902-420-9287

customercare@halifaxwater.ca

Office Hours:
Monday - Friday
8:30 AM - 4:30 PM

450 Cowie Hill Road
Halifax, NS

Website:
halifaxwater.ca

Manage your Halifax Water account at
customerconnect.halifaxwater.ca

Social Media:
Twitter @HalifaxWater
Facebook @HalifaxWater
YouTube @HalifaxWater
LinkedIn HalifaxWater

Table of Contents

About Us

Purpose Statement

Our purpose is to supply and safeguard sustainable, high-quality water services.

Vision

We will provide our customers with high-quality water, wastewater, and stormwater services. Through adoption of best practices, we will place the highest value on public health, customer service, fiscal responsibility, workplace safety and security, asset management, regulatory compliance, and stewardship of the environment. We will fully engage employees through teamwork, innovation, and professional development.

Values

Relationships - We nurture relationships with our customers, our team members, and the environment. We are engaged in the neighbourhoods we serve, and we support continual learning across our team.

Innovation - We are among the top utilities across the continent, and we are known on the global stage. We always ask, "how can we improve efficiency, sustainability, creativity and the customer experience?"

Accountability - We refuse to cut corners. We check in with our excellence standards regularly and look to one another for support. Safety steers our decision-making. We are driven to make our policies, decisions, and projects as clear as our drinking water.

Protection - Halifax Water protects the health and well-being of our population. We exist to guard natural resources, finding ways to sustain our communities and environment.

Our Leaders

Board of Commissioners March 31, 2023

Colleen Rollings
P.Eng., PMP,
Board Chair

Councillor Cathy Deagle Gammon
Vice Chair

Councillor Becky Kent

Denise Schofield
Deputy CAO,
Halifax Regional Municipality

Councillor Pamela Lovelace

Councillor Patty Cuttell

Mimi Kolomyytsev

Kostia Zaharov
P.Eng., PMP, MBA

Executive Team March 31, 2023

Louis de Montbrun
CPA, CA,
Acting CEO & General Manager

Alicia Scallion
CPA, CA,
Acting CFO & Director, Corporate Services

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

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

Susheel Arora
M.A.Sc., P.Eng.,
Director, Operations

Heidi Schedler
King's Counsel,
Director, Governance & Human Resources

Message from the Chair

As Board Chair during 2022/23, I want to recognize the value Halifax Water provides for its customers and the community with a commitment to delivering overall value through its services, public health, and sustainability.

Halifax Water is committed to building a diverse organization that is increasingly representative of the customers we serve. The Halifax Water Board and Executive Team demonstrated gender balance and diversity throughout 2022/23.

In late 2022, HALIFAX announced changes to its representative on the Board, with Denise Schofield replacing Brad Anguish as a commissioner. On behalf of the Board, I want to thank Brad for his service.

Halifax Water also experienced a change in its leadership, as former General Manager Cathie O'Toole departed to become the Chief Administrative Officer at HALIFAX. The Board thanks Cathie for serving Halifax Water and wishes her even greater success in her new role.

The utility was fortunate to have Louis de Montbrun step in as Acting CEO and General Manager. Through his leadership, the organization continued to deliver high-quality services to customers. We want to thank Louis for stewardship of the utility as the new CEO and General Manager, Dr. Tareq Al-Zabet, transitions into his new role in July 2023.

Last year, Halifax Water focused on the safety of its people, services, and capital work. Halifax Water employs approximately 560 employees, and the $106.5 million capital budget and $164.4 million operating budget in 2022/23 provided a significant local economic benefit for HALIFAX.

The services provided by Halifax Water are vital to this region. By continuing to invest in critical water, wastewater, and stormwater infrastructure, residents and businesses will experience the benefits of this economic and environmental backbone for the region now and into the future.

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

Colleen Rollings, P.Eng., PMP
Chair of the Halifax Water Board of Commissioners

Message from the Acting General Manager & CEO

Louis de Montbrun was appointed Acting General Manager and CEO from January 1, 2023, to the end of the fiscal year on March 31, 2023. He remained in the role until July 24, 2023, when Dr. Tareq Al-Zabet assumed the position.

The commitment that Halifax Water employees show to our customers continues to amaze me. Day in and day out, the team is dedicated to supplying high-quality services while we meet the challenges of a growing population, aging infrastructure, and increasing regulatory compliance.

Through these collective efforts, Halifax Water meets all its obligations under the Halifax Regional Water Commission Act and the Public Utilities Act. In addition to its obligations through legislation, the utility complies with all of its operating permits for its water and wastewater systems for the fiscal year ending March 31, 2023.

In fiscal 2022/23, Halifax Water introduced a more integrated approach to business planning to support the "One Team – One Water" vision. This approach places key business initiatives within the organization's four pillars (themes): Operational Excellence, Health, Safety & Environment, Financial & Regulatory Accountability, and People.

Last year was the second year of the Water Supply Enhancement Program, which requires more than $300 million over ten years to provide greater resilience and enable the utility to adapt to changing source water quality.

For wastewater systems, achieving compliance is an ongoing challenge, and requires balancing weather influences, equipment efficiency, and customer compliance with Halifax Water Regulations.

Halifax Water achieved 96% sample compliance with Nova Scotia Environment and Climate Change requirements at the wastewater treatment facilities, consistent with the prior year.

Our purpose is to supply and safeguard sustainable, high-quality water services. Everything we do at Halifax Water is tied to our purpose. With the excellent work of our team over the past year, we have continued to supply and safeguard sustainable, high-quality water services.

In October 2022, the Nova Scotia Utility and Review Board (NSUARB) approved Halifax Water's General Rate Application. As a result, on December 1, 2022, rates increased for water, wastewater, and stormwater services. This increase helps support the utility's overall financial health, improves the utility's ability to recover the annual cost of providing the services, and funds continuing investment in infrastructure to serve customers.

From an external perspective, Halifax Water continues to be challenged by issues beyond its control that place added cost pressures on the utility. An increasingly tight or heated labour market is affecting the ability to hire, not only for the utility but also for the major construction and engineering contractors that support Halifax Water.

We recognize that we are not the only organization experiencing increases in inflation. However, we are very mindful of the potential impacts this has on our customers. For this reason, Halifax Water is committed to containing costs and delivering cost-effective service.

Thank you to all Halifax Water employees for their commitment to serving customers and protecting the environment!

Louis de Montbrun
CPA, CA
Acting General Manager & CEO

Operational Excellence

We are committed to service, reliability, and quality for our customers. We ensure a more sustainable community by focusing on safely and efficiently building, operating, and maintaining our critical infrastructure.

Capital Project Planning

Capital Planning
The Capital Planning project has been created to provide managers with automated processes and tools to develop the annual capital budget and track project progress, improving Halifax Water's ability to deliver service improvements for our customers.

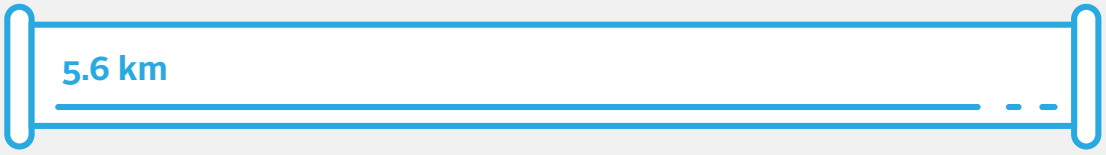
Halifax Water engineering staff perform detailed portfolio management and project management using spreadsheets and other manual data and information administration tools to develop and deliver the annual capital program. This project will replace many of these manual processes.

Capital Projects Supporting Asset Renewal

Enterprise Resource Planning
Halifax Water's current enterprise management solution, SAP, integrates business groups such as planning, purchasing, inventory, and finance. SAP is hosted and supported by the Province of Nova Scotia. The Province has decided to update to a new version of the SAP software. To ensure the best value for our customers, Halifax Water engaged an external consultant, KPMG, to lead an assessment of software options for a new enterprise management solution. A new solution, Cayenta, was identified as a cost-effective, suitable option and is being implemented at Halifax Water.

2022/23 Infrastructure Renewal Statistics

Water Mains Replaced



Wastewater/Stormwater Mains Reinforced

Wastewater/Stormwater Mains Replaced

Inside the Akerley Reservoir

Inside the Akerley Reservoir

Akerley Reservoir - Before

Akerley Reservoir

The Akerley Reservoir is located in the Burnside Industrial Park in Dartmouth. Built in 1986, the reservoir is a welded steel tank approximately 20 metres tall and 50 metres in diameter with a storage volume of 39 million litres.

Following a regular inspection of all water storage reservoirs, the Akerley Reservoir was identified as a priority for rehabilitation as the coating system showed signs of deterioration. The outside of the reservoir was experiencing surface corrosion, chalking and coating loss on the shell and roof plates.

This work began in the spring of 2022, including replacing the interior and exterior coating systems. Completion and commissioning are on track for September 2023.

Akerley Reservoir - After

Bissett Lake Wastewater Pump Station Upgrades

Gravity does most of the work getting wastewater from homes to our treatment plants, but it is sometimes necessary to pump wastewater over hills or to the treatment facility if it's a long distance away. The wastewater is treated at the treatment facility to remove harmful contaminants and bacteria. From there, the water is released into the environment.

The Bissett Lake wastewater pump station is located on Atwood Crescent in Cole Harbour and collects wastewater from a large area. The station then pumps wastewater up to a higher elevation, where it enters a pipe system that conveys the wastewater by gravity to the Eastern Passage Wastewater Treatment Facility (WWTF). The original station was constructed in the early 1970s and has a capacity of approximately 440 litres per second. The pump station is nearing the end of its useful life, so the time has come to replace and upgrade it to ensure that a reliable wastewater system continues serving Halifax Water customers in this area.

Design work for the Bissett Lake wastewater pump station is complete. The process of hiring a contractor to do the work will begin in 2023, with construction expected to take more than a year to complete.

Bissett Lake Wastewater Pump Station

Penhorn Stormwater System Replacement
Halifax Water manages an annual stormwater system replacement program as part of the utility's overall asset management plan for its stormwater infrastructure. With an inventory of approximately 900 km of stormwater gravity sewers, sections of the system needing replacement are identified and prioritized based on their condition.

The Penhorn Stormwater System Replacement project involves the replacement of various sections of the stormwater system serving Penhorn Lake and the Portland Street area of Dartmouth. Approximately 350 metres of the stormwater system will be replaced. This project will also include integration opportunities within Halifax Water and with HALIFAX concerning upgrades to Portland Street.

Design work is underway and expected to be completed in 2023, with construction expected in 2024.

Capital Projects Supporting Growth

Churchill Drive Water Transmission Main Replacement
Significant growth is anticipated on the Halifax Peninsula in the next thirty years. Some of the older transmission mains supporting downtown Halifax require additional capacity to meet future demands.

The transmission mains involved in this project were originally installed in 1856 and 1862. To ensure that our customers continue to have reliable access to high-quality drinking water for the next century, Halifax Water has begun a program to replace and upgrade the section of the aging transmission mains from Chebucto Road, along Churchill Drive, through Flynn Park to Quinn Street.

The project includes increasing the capacity of approximately 770 metres of transmission mains. The work also includes the replacement of the old transmission mains that pass through the Nova Scotia Power Chebucto Road Substation and an existing tunnel under the CN Railway.

The project is currently under construction and is scheduled for completion by the end of 2023.

Churchill Drive Water Transmission Main Replacement

Dublin Street Water Transmission Main Upgrade

Dublin Street Water Transmission Main Upgrade
The existing water main on Dublin Street was replaced with a larger capacity water transmission main as part of a phased approach to building a large capacity transmission main within the Halifax Peninsula. The need for this work was identified in the Halifax Water Infrastructure Master Plan, improving Halifax Water's ability to support continued growth and improve water system resiliency for customers throughout Peninsular Halifax. This new 400-metre-long section of transmission main connects two other previously upgraded sections on Berlin Street (2020) and Cork Street (2021).

Halifax Water partnered with HALIFAX on this project to carry out street recapitalization work along Dublin Street between Berlin Street and Young Street.

The project also included removing and replacing several lead service lines as part of Halifax Water's Get the Lead Out program.

Capital Projects Supporting Regulatory Compliance

The purpose of wastewater treatment facilities is to remove or reduce contaminants in wastewater before discharging treated water back into the environment. Both of the projects described below relate to wastewater treatment.

Halifax WWTF – New Fournier Presses
Part of the wastewater treatment process involves using chemical precipitation to capture solids (sewage sludge) from the wastewater, then pressing the sludge to remove excess water, creating sludge cake, which is further processed at our Aerotech Biosolids Processing Facility (BPF).

The original Fournier presses at the Halifax WWTF are no longer meeting the facility's needs and will be replaced and upgraded in early 2024 to protect the environment and meet our regulatory requirements. This upgrade will improve maintenance processes, increase sludge processing capacity, improve sludge quality, and reduce trucking and processing costs.

Halifax WWTF Fournier Presses

Herring Cove WWTF Fine Screens

Herring Cove WWTF – New Fine Screens
Screening is used to remove unwanted solids in wastewater, including gravel, dirt, and solid waste/ trash, that can reduce the overall treatment performance of the facility.

The Herring Cove WWTF was designed with two levels of screening: a coarse screen on the inlet of the plant, followed by fine screens. The existing fine screens no longer meet our treatment best practices and must be upgraded.

To efficiently provide wastewater services to our customers in this area, the original 10 mm bar screens are being replaced during the summer/fall of 2023 with 6 mm perforated plate screens. This change is expected to significantly improve the screening capture rate and the wastewater quality, with less debris, grit, and trash making its way to the downstream equipment and treatment processes.

Wastewater Treatment Facility Enhancements & Research

Halifax Water has made significant strides in strengthening and expanding its partnership with the Centre for Water Resources Studies at Dalhousie University, particularly in wastewater treatment. This collaboration has been supported by grants from the Natural Sciences and Engineering Council of Canada (NSERC).

We have undertaken a small-scale Biological Aerated Filter study, evaluating potential biological treatment upgrades at our chemically enhanced facilities. On a larger scale, we have established a state-of-the-art research pilot plant at the Dartmouth Wastewater Treatment Facility, allowing us to test and optimize existing processes under varying conditions to ensure reliable effluent production.

We have also started work on a Water Research Foundation project at the Eastern Passage WWTF to assess the feasibility of implementing UV-LED

Small-Scale Biological Aerated Filter Study

disinfection technology. Bringing this energy-efficient process to wastewater treatment would help reduce energy costs, providing more value to our customers and lowering our environmental impact.

We are using new data visualization programs to improve operational decision-making. This innovative approach enables us to make well-informed decisions efficiently and effectively.

The collaboration between Halifax Water staff and researchers is crucial in drawing meaningful conclusions from our research, enabling us to drive efficient, high-quality wastewater effluent production at a plant scale.

Large-Scale Pilot Plant

The journey ahead is promising, and we are excited to embark on the next phase of innovation and sustainable water resource management.

Biosolids Processing Facility

The Aerotech Biosolids Processing Facility (BPF) is in the Aerotech Industrial Park in Goffs, NS. The facility receives and processes dewatered sludge, or biosolids, from Halifax Water's WWTFs. Biosolids are currently processed using the N-Viro alkaline stabilization process to produce a Canadian Food Inspection Agency-registered fertilizer sold for use on non-food-bearing crops.

The Infrastructure Master Plan, completed in 2019 and subsequent analyses by Halifax Water staff predict that by 2046, Halifax Water will need to process more than double the current quantity of biosolids. This is due to population growth and the installation of secondary treatment processes at the Halifax, Dartmouth, and Herring Cove wastewater treatment facilities. This forecast exceeds the production capacity of the current BPF.

This significant project requires detailed planning and consideration to ensure that the new BPF is cost-effective for our customers and environmentally friendly. To date, an expert study has been completed to validate the work completed by Halifax Water. The procurement process is underway to execute a Design, Build, Operate and Maintain (DBOM) Agreement. The request for proposal portion of this process is expected to be completed early in 2024, and a new long-term DBOM contract will be in place by the end of 2024.

The new facility is expected to include capabilities for enhanced resource recovery. Biosolids will be used to produce fertilizer and recover renewable natural gas (RNG) that will be sold. The facility is anticipated to produce more than 35,000 tonnes/year of fertilizer and over 200,000 GJ/year of RNG at full capacity.

Driveway & Cross Culvert Program

Halifax Water is responsible for maintaining the stormwater system within the service boundary set by HALIFAX; this includes an extensive stormwater network in more rural areas of the municipality. These areas primarily receive stormwater services via open ditches and culverts. Staff continue to collect data on stormwater infrastructure to ensure we have an accurate inventory of assets to maintain. Halifax Water is responsible for over 20,000 culverts and hundreds of kilometres of ditches.

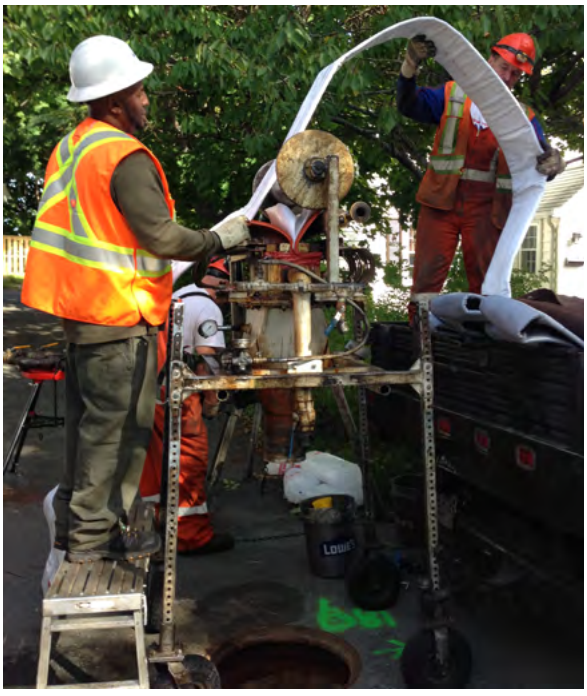
Halifax Water replaces approximately 1.5% of the inventory of driveway culverts annually. Operations staff also respond to emergencies where a failing or damaged driveway culvert could impact access to a property. To ensure we provide value to our stormwater customers, groups of driveway culverts in similarly poor condition within an area are replaced at the same time.

In 2022/23, Halifax Water replaced 221 driveway culverts. These culverts were replaced primarily by Halifax Water staff through the established capital driveway culvert program. This program is funded by Stormwater Site-Related Flow charges and is led by the Halifax Water Operations Department at a cost of $1.4M. The average cost of replacing a single driveway culvert was approximately $6,300. .

Wet Weather Management Program

Treating wastewater is a costly and technically challenging task. To maintain regulatory compliance and provide value to our customers, Halifax Water works to reduce this cost by preventing stormwater from entering the wastewater system. When stormwater flows into the wastewater system, also known as wet weather flows, it mixes in with the wastewater and eventually makes its way to a wastewater treatment facility where it is all treated. During heavy precipitation events, wet weather flows can overwhelm the system, causing damage to public and private property. Reducing wet weather flows reduces treatment costs and reserves capacity in the system for the wastewater it was built for. Our Wet Weather Management Program (WWMP) staff complete this work.

Halifax Water continues to explore new wet weather flow reduction strategies and investigation tools. These new tools have led to the creation of 20 Decision Matrix Reports, which have been key in helping identify the appropriate wet weather flow reduction approach in each WWMP study area.



Cured-In-Place Pipe Lining Work Reducing Wet Weather Flows

Manhole smoke test

Private downspout smoke test

The WWMP continues to follow the 2019 Infrastructure Master Plan, focusing most activities in priority sewersheds. These sewersheds will continue to be the priority over the next several years. Currently, 50 WWMP contractor water flow meters are in place to understand the wet weather influence on flows in these areas and help prioritize and support future projects.

Sanitary Sewer Evaluation Survey activities are used to find trouble spots within the system and sources of stormwater entering the wastewater system. These activities include flow monitoring, CCTV inspections of pipes, smoke testing and private property inspections. In 2022/23, Halifax Water used CCTV cameras to inspect over 32,000 metres of pipe and conducted smoke test investigations to look for cross-connections and leaks in over 11,000 metres of pipe.

This data is used to determine the best methods to use in each area to reduce wet weather flows. Halifax Water completes repairs on public property, while any issues found on private property are communicated to the owner.

CCTV Infrastructure Inspections

Halifax Water uses both internal resources and external contractors to complete remote CCTV inspections of our wastewater and stormwater infrastructure. The focus of both groups is to obtain high-quality data on the condition of Halifax Water infrastructure to support decisions related to asset renewal, wet weather management and capital improvements. Throughout 2022/23, Halifax Water staff worked to integrate the two CCTV programs.

Halifax Water has ramped up its internal ability to complete CCTV inspections using industry standards. This included upgrading equipment, working within the same software and completing an internal review process. Halifax Water has Pipeline Assessment & Certification Program (PACP) trained staff working on the CCTV program. Those staff conduct planned inspections and respond to operational emergencies and investigations.

CCTV Image of Stormwater Entering the Wastewater System

Water Supply Enhancement Program

The J.D. Kline and Lake Major Water Supply Plants (WSPs) have provided high-quality water to Halifax Water customers for many years. However, a combination of aging infrastructure, changes in source (lake) water conditions, and climate impacts have made the treatment processes at both WSPs more challenging.

This is especially pronounced at the J.D. Kline WSP, a direct filtration plant. In addition to challenging the plant performance, harmless natural taste and odour-causing compounds have appeared in the water source periodically, which can impact consumer confidence in the quality of the water.

Based on plant age and source water challenges, Halifax Water has determined that now is the time to modernize both plants.

To ensure the continued reliable supply of safe, high-quality drinking water and to remain compliant with current and future regulatory requirements, the J.D. Kline and Lake Major WSPs are entering a period of capital renewal, upgrade, and enhancement, which is planned to occur over the next ten years. The Water Supply Enhancement Program (WSEP) combines nine J.D. Kline WSP projects and four Lake Major WSP projects.

This integrated approach minimizes potential impacts on our services and customers.

The high-level goals of the WSEP are highlighted below:

- Upgrade, expand, replace, and enhance the existing J.D. Kline and Lake Major WSPs for the following operating horizon. This includes consideration of design life spans in the order of 20-50 years.
- Add treatment process resiliency at both WSPs to adapt to evolving source water quality changes induced by climate change, including increased levels of organic matter, biological activity, metals, minerals, algae, and algal by-products.
- Improve the reliability of both plants to meet future water quantity or water quality objectives.
- Execute the program efficiently and coordinatedly with shared design principles and strategic compatibilities such that long-term operation is streamlined between the facilities.

Pretreatment and clarification projects at both facilities are two of the initial projects that will be executed through the WSEP. Design continues progressing for both facilities, and Halifax Water plans to begin construction through some early works at the J.D. Kline WSP during the 2023/24 fiscal year. The overall program currently is slated to continue until 2032.

Lake Major Water Supply Plant Clarifier Project

The Lake Major WSP was equipped with a clarification system constructed in 1999 that, after various challenges over the years, optimization and capital upgrade strategy studies, has been deemed unsuitable for the current or future source water quality.

The existing clarification system was beginning to reach the end of its useful life and showed signs of structural weakness. This system needed to be replaced to ensure that Halifax Water could continue providing high-quality water services to our customers. With the replacement clarification system in place, Halifax Water can work on the development of a more advanced Dissolved Air Flotation (DAF) clarifier system and other plant upgrades that will meet the future needs of the utility and continue to provide our customers with the reliable services they expect.

The project was broken into two phases, one for each clarifier in November 2021 and May 2022. The project had various challenges, including a complex demolition and the need for additional resources to ensure work was completed on schedule. Additionally, during the first phase of this work, water was piped from the Halifax water supply system over the Macdonald Bridge into Dartmouth to supplement the water supply. This required several changes to the Halifax water supply system to reduce any impacts on water service for customers on either side of the harbour. During the second phase, the newly built clarifier could satisfy the average daily demand on its own.

Halifax Water learned significant lessons from the project's first phase and implemented them in phase two, improving the efficiency of the second clarifier replacement.

Both phases of work were executed under the Incident Command System. Multiple business units of Halifax Water collaborated to ensure the project was a success.

Charlie Parent and Lauren Flight, Water Quality Inspectors, conducting watershed sampling in the Pockwock watershed.

Source Water Quality Monitoring

The water quality of many lakes in Nova Scotia is changing due to lake recovery and climate change. Changing temperature and precipitation patterns, both timing and frequency, can also change source water quality.

Lake Recovery is the process by which improved air emissions standards have reduced acid rain levels. As a result, water quality in lakes around Nova Scotia and Atlantic Canada is recovering from historical acidification. Changes are both chemical and biological in nature and include an increase in pH, increase in natural organic matter, changes in concentration of metals and changes to the types of plants and animals our lakes can support.

At Halifax Water, lake recovery and climate change have resulted in changes in natural organic matter, pH, taste and odour (geosmin), colour, and algal activity. Ensuring we have industry-leading source water monitoring approaches for both long-term and seasonal monitoring for harmful algal blooms caused by cyanobacteria (blue-green algae) continues to be a priority at Halifax Water to ensure the safety of our drinking water. Halifax Water has been collecting data for many years, enabling us to plan appropriately to ensure robust treatment to manage future water quality.

Halifax Water continues to enhance and develop this important program through research partnerships with the Water Research Foundation and the Dalhousie/ Halifax Water NSERC Industrial Research Chair.

The evolution of Halifax Water's source water protection and seasonal algal monitoring programs ensures Halifax Water has industry-leading tools in place to assess risk, respond quickly to water quality changes and ensure continued delivery of high-quality drinking water for our customers.

Get the Lead Out

Removing lead service lines from the water system is a top priority for Halifax Water. The Halifax Water Get the Lead Out program will replace all lead service lines (LSLs) by 2038.

Get the Lead Out Water Service Line Inventory as of April 1, 2023

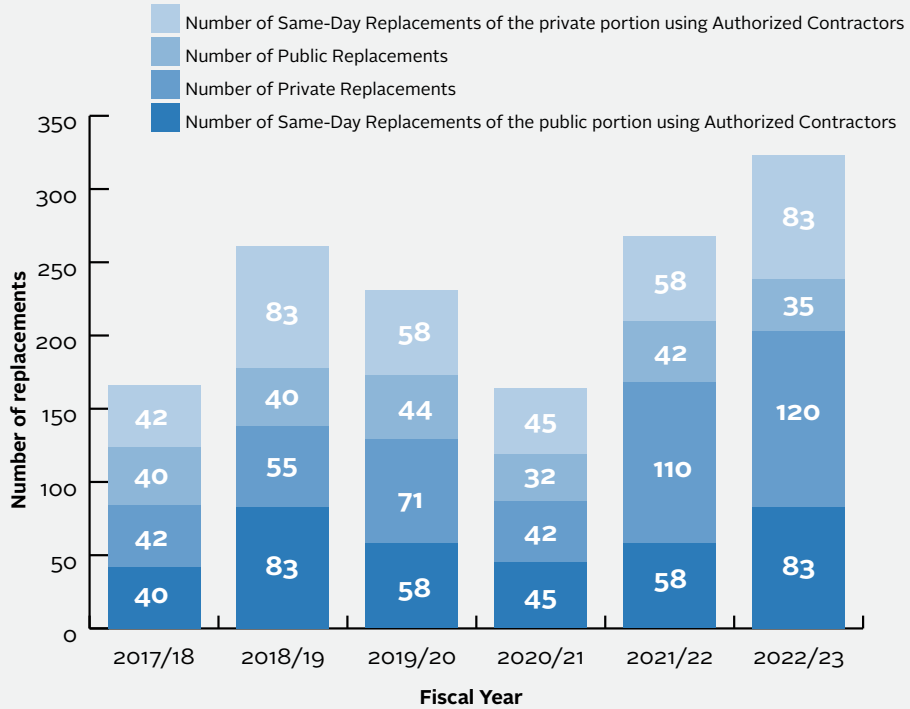
Service Line Material	Public Portion (Owned by Halifax Water)	Private Portion (Owned by the property owner)
Lead	1,193	2,776
Unknown Material	2,711	6,545

There are several projects underway to improve inventory accuracy. These include a records review process, a machine learning model to predict service line material, and service box hydro-excavation (a very gentle form of excavation using high-pressure water and an industrial vacuum system) to determine the water service line type visually.

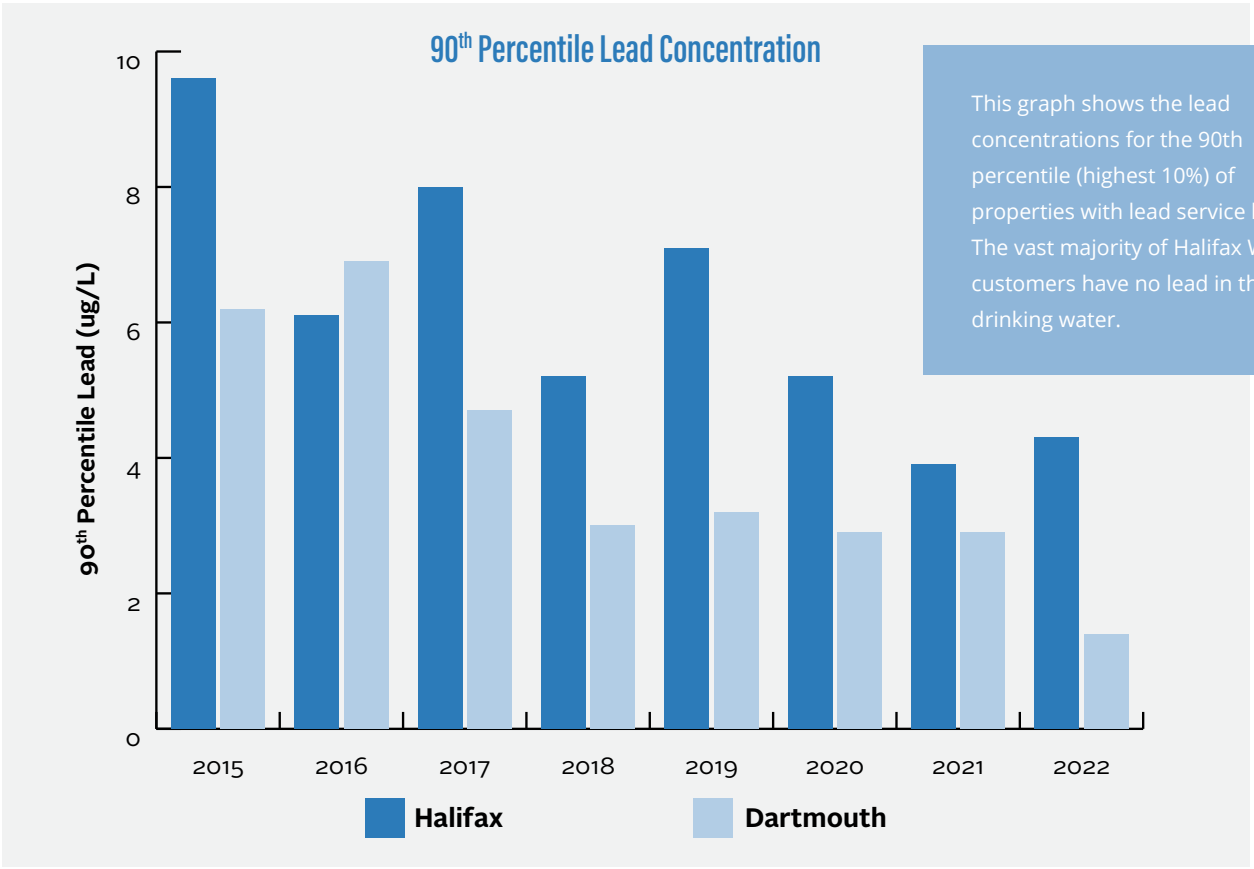
Get the Lead Out Statistics as of April 1, 2023

Year	Public LSL Goal	Public LSLs (Actual)	Private LSL Goal	Private LSLs Replaced (Actual)
2022/23	150	118	200	203

Lead Service Line Replacements as of April 1, 2023



When an authorized contractor is used for the private portion of a lead service line replacement, Halifax Water will use the same contractor to replace the public portion at the same time. These are called same-day replacements.



Lead service line replacements were coordinated with HALIFAX's street paving and renewal schedule to minimize disruption to the community and be cost-effective for ratepayers. A limited number of individual replacements were also completed based on customer application to the program, with priority given to customers who are most at risk from lead exposure. Replacements are completed at no cost to the property owner (up to a maximum of $10,000, taxes included).

Halifax Water is on track to meet the program goal of removing all lead service lines by 2038. The average cost of public replacement in 2022/23 was $7,637, while the average cost of private lead service line replacement was $6,015.

Halifax Water adds a corrosion control product to treated water to minimize exposure to lead until all lead service lines are removed from the system. Through research with Dalhousie University and monitoring within the distribution system, the product and dose are continually adjusted. This has reduced lead exposure over time, as shown in the figure below, which displays the 90th percentile lead concentrations for the first litre 6-hour stagnation annual regulatory sampling.

Water Loss Control

Halifax Water owns, maintains and operates 1580 KM of water mains throughout our service area. Finding and fixing leaks reduces water waste and the related costs of treating and distributing that water. All of this work is done to ensure our customers continue to receive good value for water services.

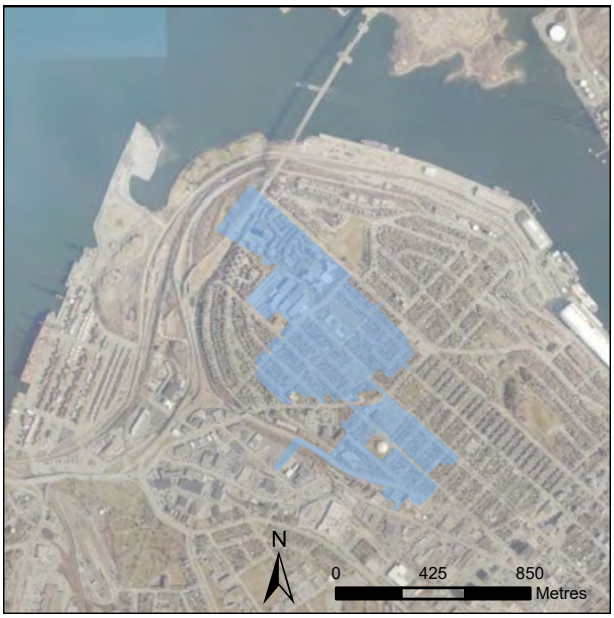
AWWA Manual 36, the industry standard in effective water loss control programs, identifies four key focus areas of a successful program:

- Speed and Quality of Repair
- Pressure Management
- Active Leakage Control
- Pipeline and Asset Management Selection, Installation, Maintenance, Renewal, Replacement

Halifax Water actively engages strategies and programs in all these areas; however, two new and exciting projects have been completed in the past year, broadening our program.

Peninsula High Pressure Zone Management
A new control valve and meter were installed to better regulate pressures in the higher grounds of the Halifax Peninsula. Previously, water pressure was managed by a reservoir in Fairview. This added level of control allows pressures in the zone to be fine-tuned through basic pressure management, balancing customer needs and system management best practices. A further step to engage Advanced Pressure Management will allow the system to react based on demand, lowering pressures during low demand, therefore lessening pressure-related stresses on infrastructure in the zone.

Takadu - Active Leakage Control
Knowing a water main leak has occurred is the critical first step toward a timely repair and minimizing water loss through an extended leak run time. Halifax Water has an extensive network of sensors monitoring flow, pressure and other details in the system. However, timely analysis and decision-making from the high volume of data can be challenging. Halifax Water is piloting Takadu, a software that applies advanced analytics to the data and can provide smart alerts to system anomalies within hours of their first occurrence. This software has identified and tracked numerous events since implementation, resulting in more efficient use of resources.



Peninsula High Pressure Zone in North End Halifax

Burnside Operations Centre

With continued cost and schedule risks following the COVID-19 pandemic for the Burnside Operations Centre, Halifax Water began reviewing alternative project delivery methods to provide more certainty around costs and scheduling.

The Integrated Project Delivery (IPD) methodology was selected as the preferred model, and in 2022, the procurement process began to find a multi-party team of qualified professionals and contractors. The IPD process enables collaborative construction by creating the right conditions for project teams to identify and deliver the best value for Halifax Water and our customers.

Beginning in September 2022, Halifax Water implemented a rigorous, fair, and transparent procurement process to find the best value for the utility's customers. This included evaluating critical factors, including assessing each proponent's approach to designing a new facility, their health, safety, and environmental record, and an assessment of earlier work.

A preferred proponent team was selected at the end of 2022/23, and a contract was finalized. Staff look forward to collaborating with our partners to deliver this important project for Halifax Water, which, once complete, will provide employees with modern facilities and enhance services for our customers.

IT Strategic Plan

Halifax Water has developed a new Five-Year Information and Technology Plan for 2023-2028. It was built by aligning with the Halifax Water Business Plan, goals, industry best practices, innovation scans, alignment with many partners, and an extensive review of internal requirements.

There are five themes in the Five-Year Roadmap:

Data Everywhere
The right data is securely available from any corporate device to all Halifax Water staff to help make decisions on resources and priorities.

Collaboration Anytime
Ensure Halifax Water is operating securely as One Team, One Water.

Employer of Choice
Recognized by our peers and community as a premier employer.

Total Xperience

- Connects customers and employees via multiple secure technology platforms to create a seemless experience.
- Educates customers and staff about technology and trends.
- Leads digital transformation for the organization and its customers.

Effortless Auditing
Be an auditor's "dream" client by meeting auditing demands.

The IT Strategic Plan aims to ensure Halifax Water can continue improving how we serve our customers by refining and updating our internal operations and ensuring that the external customer experience is exceptional.

Customer Care Centre Performance

Year	Calls offered	Calls answered	Calls abandoned	Abandon rate	Calls answered within 20 seconds	Average speed of answer (seconds)
2022/23	63,264	60,194	3,070	5%	71%	67
2021/22	73,336	67,871	5,465	7%	60%	106
2020/21	63,336	60,880	2,456	4%	71%	56

As one of the most direct customer interactions with Halifax Water, providing an exceptional customer experience through our Customer Care Centre is crucial.

This year, call volume decreased by 14%. This decrease was not unexpected, given the increase in volume last year related to the fast adoption rate of the Customer Connect online portal.

Performance improvements continue through the use of insights from our state-of-the-art telephony system. The Customer Care Centre is enhancing staffing and resource plans to ensure that staff are available as required to achieve all service levels in the coming year.

Customer Connect

As part of our ongoing commitment to meet the needs of our customers, Halifax Water continues to develop and improve Customer Connect, our online customer portal.

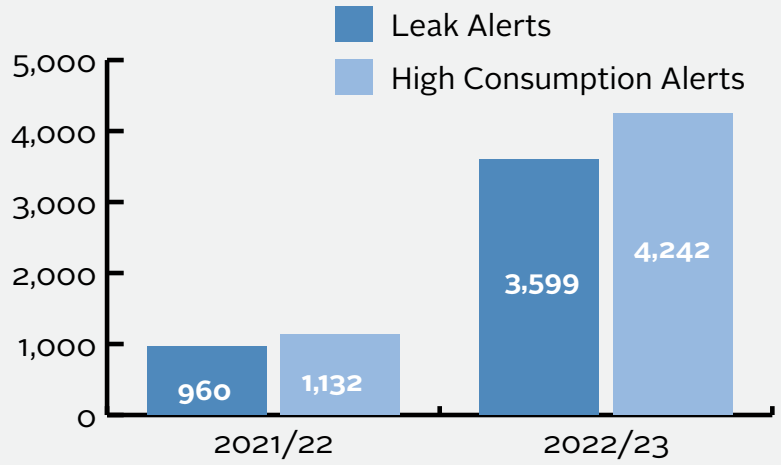
At the end of fiscal 2022/23:

41,729
Number of customers registered to date (39%).

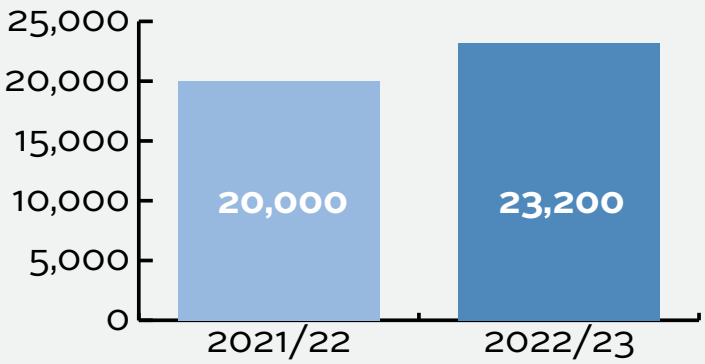
7,464
Number of customers registered during the fiscal year.

A leak and high consumption alert system was introduced in the portal in December 2021.

There were 3,599 leak alerts and 4,242 high consumption alerts sent to customers in the last fiscal year compared to 960 leak alerts and 1,132 high consumption alerts in the prior year.



23,200 customer logins per month compared to 20,000 in the prior year.



Health, Safety & Environment

The health and safety of our employees, contractors and the public is our top priority. We are focused on a safety-first culture, working to provide healthy, safe, sustainable, and reliable services for our community.

Climate Action Plan

Climate change and its potential impacts on Halifax Water's infrastructure and resources is an increasing focus for the utility. Climate considerations must be planned for and incorporated into existing programs. To reflect this, Halifax Water is developing a Climate Action Plan (CAP) with a more comprehensive approach focusing on climate change and its potential impacts on the utility.

The CAP will consolidate existing climate change activities, incorporate new initiatives, and help ensure the organization will be responsive to climate change throughout all aspects of service delivery. Modelling existing and proposed emissions scenarios will guide investment decisions around reducing greenhouse gas emissions. Local climate change projections will be reviewed to develop objectives and outline adaptation recommendations. Targets, key metrics, and timelines will be established to enable progress tracking and ensure accountability of our climate change initiatives.

Upon completion of the CAP, Halifax Water will be better prepared for long-term climate resiliency while exercising fiscal responsibility and continuing to provide customers with high-quality water, wastewater, and stormwater services.

Solar Energy Projects

In July 2020, Halifax Water was awarded funding through the Investing in Canada Infrastructure Program (ICIP). Specific to the climate change mitigation sub-stream, it focused on four multi-facility Community Solar Photovoltaic (PV) projects at Halifax Water facilities, including:

Solar Energy Project Estimated Capital Costs

Location	Size Kilowatt Alternating Current (kW_{AC})	Total Cost	Fed/Prov Portion (73.33%)	Halifax Water Portion (26.67%)	Year 1 Estimated Revenues	Simple Payback
Aerotech Wastewater Treatment Facility	125 kW_{AC}	$710,000	$385,997	$302,893	$28,650	9.1 years
450 Cowie Hill Road Administration Building	100 kW_{AC}	$475,000	$280,847	$181,115	$22,240	7.9 years
New Burnside Operations Centre	200 kW_{AC}	$950,000	$561,694	$357,486	$58,800	6.1 years
Totals	**425 kW_{AC}**	**$2,135,000**	**$1,228538**	**$841,494**	**$109,690**	**7.7 years**

**Figures are rounded.*

The first project, located at the Aerotech WWTF, is expected to be complete in September 2023. The two Cowie Hill Road projects are anticipated to be awarded in fall 2023, with construction expected by winter 2024. The new East Operations Building (Burnside Operations Depot) solar project will be included in the scope of work for the design, construction, and commissioning of this new facility, with an anticipated completion in 2025/26.

The Halifax Water Community Solar PV projects will see the installation of approximately. 425 kW_{AC} of solar capacity. This will offset Halifax Water's current electrical use with a renewable energy source, will reduce greenhouse gas (GHG) emissions by over 6,975 tonnes of carbon dioxide equivalent (tCO2e), and will reduce the utility's operating costs by over $1.6 million over the expected life of the project, directly benefiting Halifax Water's customers.

Halifax Water began operating a 75 kW system at the Halifax WWTF in January 2021. To date, that system has produced approximately 260 MWh of renewable energy.

Aerotech WWTF Solar PV Panels

Aerotech WWTF Solar PV Panels

Halifax WWTF Solar PV Panels

Environmental Management System Update

An Environmental Management System (EMS) is a comprehensive framework for consistently tracking procedures, records, and processes that effectively manage environmental issues. While the EMS helps ensure regulatory compliance, it also supports more sustainable day-to-day operations and engages employees in these activities. This program is audited against ISO 14001 standards, and when it passes, it receives certification through ISO.

In May 2022, the Environmental Management System was successfully implemented at the Timberlea WWTF, the corporate office at 450 Cowie Hill Road and the West Operations Depot at 455 Cowie Hill Road.

In 2023/24, the EMS will expand further to encompass the Halifax Water depots, specifically Mann Street, Park Avenue, Neptune Crescent, and Bissett Road, and the distribution and collections systems. This strategic expansion will allow Halifax Water to streamline and integrate the EMS practices throughout the entire organization.

ISO 14001 Certification EMS – Certification for Timberlea WWTF and 450 & 455 Cowie Hill Road

Cogswell District Energy System

The redevelopment of the Cogswell District has provided Halifax Water with an opportunity to install the distribution piping system required for the Cogswell District Energy System (DES).

With approval by the Nova Scotia Utility and Review Board (NSUARB) in 2023, Halifax Water can move forward with using thermal energy from effluent at the Halifax WWTF to provide heating and cooling services to new buildings proposed for the Cogswell redevelopment area.

Cogswell District Energy System Lines Prepared for Installation

Cogswell District Energy System Lines Being Installed

This project aligns with Halifax Water's purpose, vision, and environmental objectives. It will significantly contribute to the goals of HALIFAX's "HalifACT 2050" initiative, providing long-term energy and GHG emission reductions within the downtown core.

To date, Halifax Water has made the following progress on the project:

- Completed an initial feasibility study for the DES.
- Assisted HALIFAX make charter changes to allow district energy within the municipality.
- Assisted HALIFAX with the enactment of By-Law D-500, Respecting District Energy.
- Completed the detailed design of the linear infrastructure.
- Developed a draft financial model and business case analysis for the new utility.
- Evaluated the business case based on several operating and ownership scenarios.
- Completed a by-law review of other Canadian jurisdictions implementing similar district energy utilities.
- Completed a detailed DES information package to provide more specific details for stakeholders and developers.
- Received approval from the NSUARB for related capital expenditures and establishing a regulated district energy service within Halifax Water.
- Finalized a cost-sharing agreement for the DES distribution piping system with HALIFAX.

The key utility development activities yet 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.
- Ongoing enhancement of the business case analysis to align with the cost-of-service model and rate structure.
- Complete detailed designs and construct the remaining DES infrastructure, including the DES Energy Center (located at the Halifax WWTF) and the Energy Transfer Stations (located in each new building).

Environmental Engineering

The Inflow & Infiltration (I&I) and Pollution Prevention (P2) Programs regulate the quantity and quality of discharge from customer connections into Halifax Water's wastewater and stormwater systems.

Through the I&I Program, Halifax Water staff identify and work to resolve private property connections where stormwater enters the wastewater system. The goal is to reduce I&I in target areas from public and private sources in support of the Wet Weather Management Program (WWMP).

Inflow & Infiltration Reduction Program
In 2022/23, the I&I team worked closely with the WWMP team to complete smoke testing work on approximately 12 KM of pipes. The I&I team also began work on a Downspout Disconnection Program to disconnect roof downspout flows from the Halifax Water's systems. A pilot project was completed for campus properties, resulting in a more precise definition of these as having ten or more buildings serviced by a private system. The results of this pilot will be used to develop a program manual. Work also continued developing a New Service Account Compliance Program (NSAC), linking private property I&I compliance to creating a new service account with Halifax Water.

Pollution Prevention Program
The P2 Program identifies and addresses non-compliant discharges to the wastewater system. Staff inspected, investigated, and engaged 251 industrial/commercial/institutional (ICI) customers in 2022/23. The P2 team responded to numerous spills and non-compliant discharges, including silt discharge into wastewater and stormwater systems, and wastewater-to-stormwater cross-connections. In the past year, the team successfully resolved five of these cross-connections.

Safety Update

Continuous improvement is at the core of Halifax Water's Safety Program. In 2022/23, updates and modifications were made to the Joint Occupational Health and Safety Committee (JOHSC) structure and the Safety Excellence Committee (SEC) was introduced. To support this, work began transitioning from the existing safety system to a structured Safety Management System (SMS – ISO 45001).

With increasing demands caused by organizational restructuring and growth, it places even greater emphasis on enhancing Halifax Water's safety culture and those that manage it. The tracking and reporting of near-miss incidents has increased, and the learnings from these reports are being applied to mitigate risks before the potential for actual injuries. In 2022/23, there were 97 near misses reported. The Lost Time Injury Frequency (LTIFR) rate was 0.91, below the target of 3.5 established in Halifax Water's Corporate Balance Scorecard for that year.

Financial & Regulatory Accountability

We are ensuring that Halifax Water has the capacity to fund existing and future infrastructure. We prudently manage assets and operate our business by balancing value and customer service.

Financial Overview

Halifax Water received a clean audit opinion from Grant Thornton LLP on the financial statements for the fiscal year ended March 31, 2023. The financial statements are presented in accordance with International Financial Reporting Standards (IFRS). Halifax Water also produces financial information in the format required by the NSUARB in accordance with the NSUARB Water Utility Accounting and Reporting Handbook (Handbook).

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

Summary financial information is presented under "Abbreviated Financial Overview (IFRS)" on page 38 and under "Abbreviated Financial Overview (Handbook)" on page 40.

The audited financial statements can be located at **halifaxwater.ca/publications-reports**.

Summarized Statement of Earnings Comparison to Budget NSUARB Handbook

	Budget 2022/23 '000	Actual 2022/23 '000	Actual 2021/22 '000	2022/23 Budget/Actual $ Variance	2022/23 Budget/Actual % Variance
Operating revenues	$152,765	$155,089	$150,502	$2,324	1.5%
Operating expenditures	$128,787	$128,038	$122,521	$(749)	(0.6%)
Earnings from operations	$23,978	$27,051	$27,981	$3,073	12.8%
Financial and other revenues	$733	$1,299	$796	$566	77.2%
Financial and other expenditures	$35,596	$36,110	$35,159	$514	1.4%
Loss for the year	**$(10,885)**	**$(7,760)**	**$(6,382)**	**$3,125**	**(28.7%)**

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

- The full actuarial liability of employee future benefits is not considered an expense for the Handbook and could result in either positive or negative impacts on IFRS income;
- Principal payments on long-term debt are an expense for the Handbook but not under IFRS;
- Depreciation expense on contributed assets is not an expense for the Handbook for water and wastewater assets. For stormwater assets, 25% of depreciation on contributed assets is included as an expense for the Handbook results.

- Amortization of contributed capital is not considered revenue under the Handbook; and,
- Various depreciation adjustments, including the add-back of losses on the disposal of utility plant in service, componentization of assets and shorter useful lives, result in higher depreciation under IFRS than under the Handbook.

Reconciliation IFRS to Handbook Results

	Actual 2022/23 '000	Actual 2021/22 '000
IFRS comprehensive earnings	$46,951	$45,594
Add non-cash pension expense	$6,851	$9,229
Subtract debt principal payments	$(22,379)	$(21,477)
Add depreciation expense on contributed assets	$18,793	$18,592
Subtract amortization of contributed capital	$(18,793)	$(18,592)
Add various depreciation adjustments	$1,243	$1,179
Subtract other comprehensive income gain	$40,426	$(40,907)
NSUARB Loss	**$(7,760)**	**$(6,382)**

Under IFRS, the comprehensive earnings are $47.0M. After the adjustments described above, the loss for the year under the Handbook is $7.8M. From a budget perspective, the loss was less than budget due to an increase in rates and expenditures being less than expected.

Water services loss of $3.1M was $0.4M less than the prior year and $1.1M less than budget. The primary difference from the budget in water services was an increase in operating revenues relating to an increase in rates.

Wastewater services loss was $1.7M as compared to prior year earnings of $0.6M and was better than budget. The primary difference from the budget relates to higher operating and other revenues related to an increase in rates offset by higher expenditures.

Stormwater services loss of $3.0M decreased from the prior year's loss by $0.3M and was $1.4M better than budget. The difference from budget relates to an increase in operating revenues due to increased rates and reduced expenditures.

Operating Results by Service

	Budget 2022/23 '000	Actual 2022/23 '000	Actual 2021/22 '000	2022/23 Budget/Actual $ Variance	2022/23 Budget/Actual % Variance	Actual/Actual $ Variance
Water	$(4,173)	$(3,069)	$(3,428)	$1,104	(26.5%)	$359
Wastewater	$(2,270)	$(1,676)	$389	$594	(26.2%)	$(2,065)
Stormwater	$(4,442)	$(3,015)	$(3,343)	$1,427	(32.1%)	$328
Loss	$(10,885)	$(7,760)	$(6,382)	$3,125	(28.7%)	$(1,378)

Revenue

Operating revenues increased from the prior year by $4.6M. Consumption increased by 1.7% on a volumetric basis, resulting in an increase in consumption revenue. Base charge revenue increased slightly due to new customers. Overall, the main contributing factor to the increase in operating revenues was the approval of rate increases for water consumption and wastewater discharge effective December 1, 2022. Water rates increased from $0.976 per cubic metre to $1.017 per cubic meter, and wastewater rates increased from $2.073 per cubic metre to $2.189 per cubic metre. Stormwater rates also increased effective December 1, 2022, contributing to the overall increase in operating revenues. The stormwater site generated charge revenue is $0.6M more than the prior year due to the rate increases and the stormwater boundary expansion effective June 1, 2022. Stormwater right of way revenue also increased as a result of the increase in customers.

The wastewater rebate, which is available to certain large customers whose wastewater is a lower proportion of their consumed water, increased $0.2M from the prior year due to new customers in the current year and existing customers increasing their discharge into our system.

Operating Revenues Handbook	Actual 2022/23 '000	Actual 2021/22 '000	$ Variance	% Variance
Consumption revenues	$99,346	$96,497	$2,849	3.0%
Base charge revenue	$33,967	$33,635	$332	1.0%
Wastewater rebate	$(1,531)	$(1,297)	$(234)	18.0%
Metered sales total	**$131,782**	**$128,835**	**$2,947**	**2.3%**
Stormwater site generated charge	$6,931	$6,294	$637	10.1%
Stormwater right of way	$4,475	$3,835	$640	16.7%
Public fire protection	$7,744	$7,628	$116	1.5%
Private fire protection	$1,377	$1,270	$107	8.4%
Other operating revenue	$2,780	$2,640	$140	5.3%
Operating revenue total	**$155,089**	**$150,502**	**$4,587**	**3.0%**

Operating Expenditures

Operating expenditures for 2022/23 are $128.0M, an increase of $5.5M or 4.5% compared to the prior year. The drivers of the increase include depreciation and amortization expense, lead service line replacement costs, and higher chemical and fuel costs due to price increases.

Operating Expenditures Handbook	2022/23 '000	2021/22 '000	$ Variance	% Variance
Water supply and treatment	$11,646	$10,760	$886	8.2%
Water transmission and distribution	$11,757	$11,316	$441	3.9%
Wastewater collection	$13,691	$12,988	$703	5.4%
Stormwater collection	$4,719	$4,566	$153	3.4%
Wastewater treatment	$23,420	$21,774	$1,646	7.6%
Engineering and technology services	$13,677	$13,719	$(42)	(0.3%)
Regulatory services	$4,434	$4,392	$42	1.0%
Customer services	$4,447	$4,811	$(364)	(7.6%)
Corporate services	$3,075	$3,062	$13	0.4%
Administration services	$5,578	$5,359	$219	4.1%
Depreciation and amortization	$31,594	$29,774	$1,820	6.1%
	$128,038	**$122,521**	**$5,517**	**4.5%**

Financial & Other Expenditures

Reported financial and other expenditures totalled $36.1M in 2022/23, an increase of $1.0M or 2.7% compared to the prior year. The increase was long-term debt repayments.

Financial and Other Expenditures Handbook	Budget 2022/23 '000	Actual 2022/23 '000	Actual 2021/22 '000	2022/23 Budget/Actual $ Variance	2022/23 Budget/Actual % Variance	Actual/Actual $ Variance
Interest on long term debt	$6,668	$6,851	$6,859	$183	2.7%	$(8)
Repayment on long term debt	$21,846	$22,379	$21,477	$533	2.4%	$902
Amortization of debt discount	$233	$227	$228	$(6)	(2.6%)	$(1)
Dividend/grant in lieu of taxes	$6,803	$6,524	$6,466	$(279)	(4.1%)	$58
Other	$46	$129	$129	$83	180.4%	$0
	$35,596	**$36,110**	**$35,159**	**$514**	**1.4%**	**$951**

Regulated & Unregulated Activities

Regulated Activities

Activities regulated by the NSUARB show a loss of $8.6M, representing an increase of $1.7M compared to the prior year.

Unregulated Activities

Earnings from unregulated activities increased by $0.3M from the prior year due to a one-time waste disposal for a marine vessel.

Results by Activity Handbook	Budget 2022/23 '000	Actual 2022/23 '000	Actual 2021/22 '000	2022/23 Budget/Actual $ Variance	2022/23 Budget/Actual % Variance	Actual/Actual $ Variance	Actual/Actual % Variance
Regulated activities	$(11,449)	$(8,554)	$(6,889)	$2,895	(25.3%)	$(1,665)	24.2%
Unregulated activities	$564	$794	$507	$230	40.8%	$287	56.6%
Loss	$(10,885)	$(7,760)	$(6,382)	$3,125	(28.7%)	$(1,378)	21.6%

Statement of Financial Position

Assets
Utility plant in services assets, net of accumulated depreciation, are $1,302.5M, which is $25.2M or 2.0% higher than last year. Total of new assets capitalized in the fiscal year were $79.6M. At the end of the fiscal year, there was $79.4M in capital work in progress, compared to $51.0M last year.

Cash and cash equivalents
Cash and cash equivalents balance of $44.6M is lower than the prior year by $21.0M due to increases in payments related to an increased capital expenditures.

The liquidity on the balance sheet (ratio of current assets divided by current liabilities) is 1.09 (per NSUARB Handbook reporting).

Additions to Utility Plant in Service and Intangibles IFRS	
	Cumulative '000
Bedford South Hemlock Reservoir	$8,162
Morris Lake Pump Station	$2,902
Lake Major Clarifier	$2,265
Dublin Street Water Main	$2,228
Windgate Drive Transmission Main	$1,969
	$17,526
All other projects:	
Water	$25,323
Wastewater	$21,547
Stormwater	$15,164
	$62,034
Total additions	**$79,560**

Capital Work in Progress IFRS	
	Cumulative '000
ERP Replacement Project	$10,842
Cowie Hill Reservoir	$7,622
Gravity Sewer Albro Lake to Jamieson Street	$7,359
South Park/Cathedral Lane Sewer Separation	$5,021
Akerley Reservoir	$3,636
Total	**$34,480**
All other projects:	
Water	$19,903
Wastewater	$23,214
Stormwater	$1,850
Total	**$44,967**
Capital work in progress	**$79,447**

Debt

Debt remains an important funding source for Halifax Water's capital program. Total long-term debt is $218.5M. New debt of $15.7M was received in May 2022, and repayments during the year were $21.4M.

The debt service ratio of 18.99% is below the maximum 35.00% ratio allowed under the blanket guarantee agreement with HALIFAX.

Abbreviated Financial Overview (IFRS)				
	March 31, 2023 '000	March 31, 2022 '000	$ Variance	% Variance
Assets				
Current				
Cash and cash equivalents	$44,596	$65,586	($20,990)	(32.0%)
Receivables	$48,376	$35,589	$12,787	35.9%
Inventory and prepaids	$4,799	$4,450	$349	7.8%
Total current assets	**$97,771**	**$105,625**	**($7,854)**	**(7.4%)**
Utility plant in services				
Cost	$1,682,380	$1,607,243	$75,137	4.7%
Accumulated depreciation	($379,866)	($329,883)	($49,983)	15.2%
Net utility plant in service	$1,302,514	$1,277,360	$25,154	2.0%
Intangible assets	$22,807	$20,805	$2,002	9.6%
Capital work in progress	$79,447	$51,013	$28,434	55.7%
Total non-current assets	**$1,404,768**	**$1,349,178**	**$55,590**	**4.1%**
Regulatory deferral account	$2,236	$2,428	($192)	(7.9%)
Total assets and regulatory deferral account	**$1,504,775**	**$1,457,231**	**$47,544**	**3.3%**
LIABILITIES AND EQUITY				
Payables, deposits and unearned revenue	$43,665	$33,138	$10,527	31.8%
Long term debt	$218,451	$224,182	($5,731)	(2.6%)
Deferred contributed capital	$938,258	$908,589	$29,669	3.3%
Employee benefit obligations	$8,078	$41,950	($33,872)	(80.7%)
Total liabilities	$1,208,452	$1,207,859	$593	0.0%
Total equity	$296,323	$249,372	$46,951	18.8%
Total liabilities and equity	**$1,504,775**	**$1,457,231**	**$47,544**	**3.3%**

Abbreviated Financial Overview (IFRS)				
	March 31, 2023 '000	March 31, 2022 '000	$ Variance	% Variance
Earnings And Comprehensive Earnings				
Operating revenues	$155,089	$150,502	$4,587	3.0%
Operating expenditures (excluding depreciation and amortization)	($103,295)	($101,976)	($1,319)	1.3%
Depreciation and amortization	($51,438)	($49,572)	($1,866)	3.8%
Loss from operations	$356	($1,046)	$1,402	(134.0%)
Financial and other revenues	$20,092	$19,607	$485	2.5%
Financial and other expenditures	($13,731)	($13,682)	($49)	0.4%
Earnings for the year	$6,717	$4,879	$1,838	37.7%
Regulatory deferral account depreciation	($192)	($192)	$0	0.0%
Re-measurement on defined benefits plans	$40,426	$40,907	($481)	(1.2%)
Total comprehensive earnings for the year	**$46,951**	**$45,594**	**$1,357**	**3.0%**

Abbreviated Financial Overview (Handbook)				
	March 31, 2023 '000	March 31, 2022 '000	$ Variance	% Variance
Assets				
Current				
Cash and cash equivalents	$44,596	$65,586	($20,990)	(32.0%)
Receivables	$48,376	$35,589	$12,787	35.9%
Inventory and prepaids	$4,799	$4,450	$349	7.8%
Total current assets	**$97,771**	**$105,625**	**($7,854)**	**(7.4%)**
Utility plant in services				
Cost	$2,004,775	$1,924,866	$79,909	4.2%
Accumulated depreciation	($640,962)	($590,704)	($50,258)	8.5%
Net utility plant in service	$1,363,813	$1,334,162	$29,651	2.2%
Capital work in progress	$79,447	$51,013	$28,434	55.7%
Total non-current assets	**$1,443,260**	**$1,385,175**	**$58,085**	**4.2%**
Regulatory deferral account	$2,236	$2,428	($192)	(7.9%)
Total assets and regulatory deferral account	**$1,543,267**	**$1,493,228**	**$50,039**	**3.4%**
LIABILITIES AND EQUITY				
Payables, deposits and unearned revenue	$43,665	$33,138	$10,527	31.8%
Long term debt	$218,451	$224,182	($5,731)	(2.6%)
Deferred contributions	$94,210	$69,140	$25,070	36.3%
Total liabilities	$356,326	$326,460	$29,866	9.1%
Total equity	$1,186,941	$1,166,768	$20,173	1.7%
Total liabilities and equity	**$1,543,267**	**$1,493,228**	**$50,039**	**3.4%**

Abbreviated Financial Overview (Handbook)				
	March 31, 2023 '000	March 31, 2022 '000	$ Variance	% Variance
Earnings And Comprehensive Earnings				
Operating revenues	$155,089	$150,502	$4,587	3.0%
Operating expenditures (excluding depreciation and amortization)	($96,444)	($92,747)	($3,697)	4.0%
Dividend/grant in lieu of taxes	($6,524)	($6,466)	($58)	0.9%
Depreciation and amortization	($31,594)	($29,774)	($1,820)	6.1%
Earnings from operations	$20,527	$21,515	($988)	(4.6%)
Financial and other revenues	$1,299	$796	$503	63.2%
Financial and other expenditures	($29,586)	($28,693)	($893)	3.1%
Loss for the year	**($7,760)**	**($6,382)**	**($1,378)**	**21.6%**

2022 General Rate Application Update

In February 2022, Halifax Water filed a general rate application to increase water, wastewater, and stormwater rates. The NSUARB approved the rate increase on October 31, 2022, with an effective date of December 1, 2022. Base charges for water and wastewater have not increased since April 1, 2016, and will remain the same for metered customers. The volumetric rate for water had also not increased since April 1, 2016. The volumetric rate for wastewater rose to $2.073 per cubic metre effective April 1, 2021. Stormwater rates had not been increased since July 1, 2017.

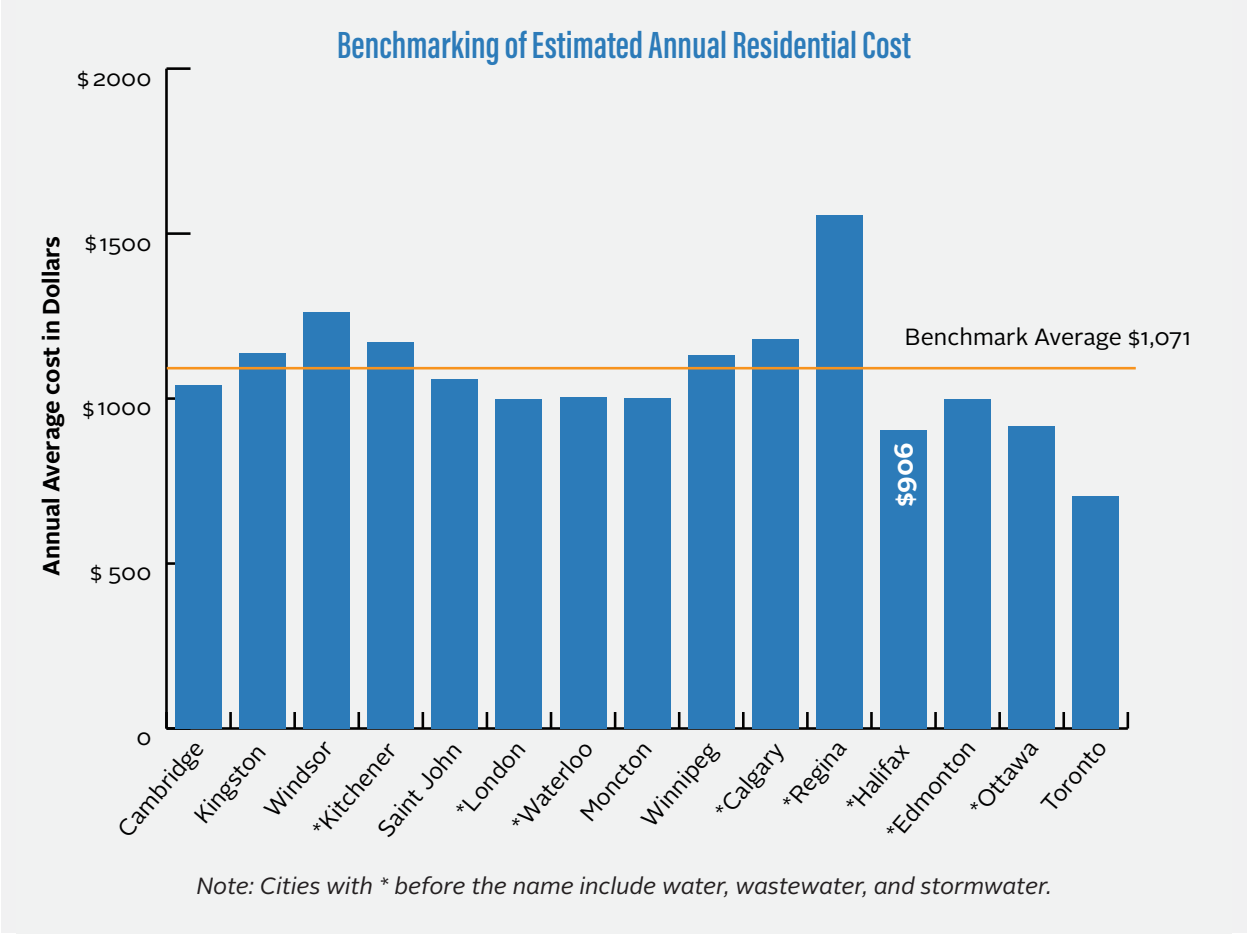
Even with these increases, the median residential customer in Halifax would pay 1.13% of their income for water, wastewater and stormwater services. A cost that continues to be below the average benchmark communities across Canada.

The approved rates are as follows:

Summary of Rates - Water & Wastewater		
	Effective December 1, 2022	Effective April 1, 2023
Water	$1.017/1000 L	$1.128/1000 L
Wastewater	$2.189/1000 L	$2.259/1000 L
Combined	$3.206/1000 L	$3.387/1000 L
Base Charges (per month, based on 5/8" residential water meter)		
Water	$13.00	$13.00
Wastewater	$14.00	$14.00

The approved rates are as follows:

Summary of Rates - Stormwater		
Residential - Impervious Area	Effective September 1, 2022	Effective April 1, 2023
Less than 50 m^2	$0.00	$0.00
50 m^2 to 200 m^2	$16.00	$19.00
210 m^2 to 400 m^2	$32.00	$38.00
410 m^2 to 800 m^2	$64.00	$76.00
Greater than 810 m^2	$96.00	$115.00
Culvert only service	$16.00	$19.00
ICI rate per m^2	$0.145	$0.173



*Note: Cities with * before the name include water, wastewater, and stormwater.*

Cost Containment

Cost containment continues to be a focus for Halifax Water and contributes to our ability to maintain affordable rates. A formal cost containment program has been in place since 2013, and initiatives from fiscal 2013/14 to 2022/23 resulted in average annual savings of $5.5M.

Cost containment initiatives have had the most significant impact in the areas of Human Resources and Facilities/Process Strategies. The pension plan re-design initiated in 2015/16 is one of the main contributors to cost containment savings. Annual savings related to pension plan re-design are approximately $1.7M. In addition, effective January 1, 2022, the contribution rate for the pension plan decreased from 10.34% to 9.60%, resulting in annual cost savings of approximately $0.3 million.

Facilities/Process Strategies initiatives vary; however, Halifax Water's Energy Efficiency Program is a significant contributor. Projects under this program represent approximately $1.6 million for 2022/23 and include energy savings programs such as:

- The renewable natural gas utilized at the Mill Cove and Timberlea WWTFs ($0.4M).
- The annual shutdown of the ultraviolet disinfection systems at the Harbour Solutions and Eastern Passage WWFTs ($0.2M).
- Heat recovery processes at the Harbour Solutions WWTFs ($0.2M).
- Lighting upgrades at various other facilities.

The Halifax Water cost containment program in 2022/23 resulted in one-time and ongoing cost savings of $0.7M in the following categories:

- Human Resource Strategies $0.4M
- Facilities/Process Strategies $0.2M
- Other Strategies $0.1M

Pension Plan

All Halifax Water employees are members of one or two defined-benefit pension plans.

Employees who transferred from HALIFAX, of which 47 remain, are members of the HRM Pension Plan. Halifax Water is obligated to make contributions for these employees' service to the HRM Pension Plan.

For all other employees, Halifax Water maintains the Halifax Regional Water Commission Employees' Pension Plan (HRWC Employees' Pension Plan). An actuarial valuation of the HRWC Employees' Pension Plan was conducted at January 1, 2022, and an extrapolation of those results was performed at January 1, 2023. Abbreviated results of this extrapolation are shown below:

Going Concern Financial Position

	Jan 1, 2023 '000 (Extrapolation)	Jan 1, 2022 '000 (Actuarial Valuation)
Value of Assets	$173,018	$172,968
Liabilities	$(144,029)	($135,207)
Provision for Adverse Deviation (PFAD)	$(10,019)	($9,405)
Going Concern Excess	$18,970	$28,356
Funded Ratio	112.3%	119.6%

The HRWC Employees' Pension Plan's funded ratio has decreased from 119.6% to 112.3% since the actuarial valuation at January 1, 2022. The decrease is primarily related to volatile market conditions throughout 2022 resulting in lower than expected gains on investments throughout the year.

In 2022, the net assets available for benefits increased to $175.2 M from $174.6 M in 2021. The increase was mainly due to contributions into the plan amounting to more than the benefit payments and expenses coming out of the plan throughout the year. Abbreviated statement of changes in net assets available for benefits is shown below:

Net Assets Available for Benefits at the Year Ended December 31

	2022 '000	2021 '000
Revenue	$155	$18,771
Contributions	$6,653	$6,693
Expenses	$6,204	$5,784
Increase in net assets available for benefits	$604	$19,680

Grant Thornton LLP audits the financial statements for the HRWC Employees' Pension Plan which are available at **halifaxwater.ca/publications-reports**. The financial statements contain the independent auditor's report issued by Grant Thornton.

Cogswell Redevelopment Update

The Cogswell District Project (CDP) is a municipal-led initiative to transform the Cogswell interchange into a more vibrant urban neighbourhood in the heart of downtown Halifax.

The project is entering its third year of construction. Temporary roads were installed and opened in the fall of 2022 to allow work to proceed on Upper Water Street, Lower Water Street and Hollis Street. New water, wastewater and district energy (DES) mains are being installed, and work in the Cogswell Street and Albemarle Street areas will commence in the summer of 2023.

The NSUARB approved $19,500,000 for the CDP water, wastewater and stormwater infrastructure. The CDP has an overall estimated cost of approximately $122.6M; the CDP is expected to span fiscal years 2021-22 to 2024-25. Halifax Water is working with HALIFAX to finalize a prudent cost-sharing arrangement for our customers.

Regional Development Charge Update

Halifax Water oversees the development and collection of water and wastewater Regional Development Charges (RDCs) - these fund upgrades to regional water and wastewater systems to facilitate projected population growth. The 2019 application to update the RDC was approved in April 2021. The new approval allows annual adjustments for the Consumer Price Index (CPI), with five-year updates submitted to the NSUARB.

The table below shows the cumulative accounting of all RDCs received and invested in infrastructure at the end of the fiscal year on March 31, 2023. The RDC provides cost-neutral funding for services for the projected growth of HALIFAX. Halifax Water is coordinating with HALIFAX on updating the infrastructure requirements to support projected growth as they update their Regional Plan.

Regional Development Charge Collections and Expenditures

Regional Development Charge	Regional Development Charges Collected	Interest	RDC Funds Invested in Infrastructure	Remaining RDC Funds available for Future Investment in Infrastructure
Water	$11,885,282	$206,194	$6,256,585	$5,834,891
Wastewater	$105,819,397	$2,375,645	$23,031,126	$85,163,916
Grand Total	**$117,704,679**	**$2,581,839**	**$29,287,711**	**$90,998,807**

Engineering Approval Statistics

The Engineering Approvals group is focused on adherence to the Halifax Water Design Specifications, the Supplementary Standard Specification and the Halifax Water Regulations with respect to connections to and expansions of Halifax Water systems. The administration of new service connections includes the RDC.

In 2022/23, the Engineering Approvals group processed:

Application Type	2022/23	2021/22	2020/21
Water Permit Reviews	4,402	3,538	Not Previously Tracked
Water Permit Approvals	900	1,223	1,226
Subdivision Approvals	191	166	199
Metres of New Water Main	4,861	3,185	2,175
Metres of New Wastewater Main	4,694	4,037	1,861
Metres of New Wastewater Main	6,562	3,247	1,582
Demolition Permits	155	154	167
Clearance Letters	28	30	18
Tender Reviews	88	85	80
New Backflow Prevention Applications	107	115	122
Backflow Prevention Devices Active	5,993	5,812	7,204

Drinking Water Regulatory Compliance

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

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

Halifax Water undertakes a comprehensive water testing program with bacteriological testing done weekly at 63 locations within the urban core and at each of the small systems.

Over 3,250 tests are conducted each year for total coliform bacteria and E. coli. Halifax Water consistently achieves results where 99.9% of samples are absent of bacteria, as shown to the right:

	% Absent	# of Samples
Pockwock	100.0%	1399
Lake Major	99.9%	1209
Bennery	100.0%	156
Five Islands	100.0%	106
Silver Sands	100.0%	104
Middle Musquodoboit	100.0%	104
Collins Park	100.0%	108
Bomont	100.0%	104
Totals		**3290**
Absent		3289
Present		1
All Sites - % Absent		**99.97%**

Wastewater Treatment Regulatory Compliance

As a provider of wastewater services, part of Halifax Water's role is protecting the environment; with this in mind, the EMS, ISO 14001 Certification was expanded to include all of the wastewater treatment facilities. The EMS program provides additional operational consistency, ensuring that the treated effluent released into the environment meets the regulatory requirements outlined in our operating permits.

Wastewater treatment facilities in Nova Scotia are regulated by Nova Scotia Environment and Climate Change (NSECC). They set effluent discharge limits for all wastewater facilities. The limits define maximum concentrations of parameters such as Carbonaceous Biochemical Oxygen Demand (CBOD is a measure of the amount of material in water which will consume oxygen as it decomposes), Total Suspended Solids (TSS is a measure of the amount of particulate matter in the water), and E. coli (bacteria associated with wastewater). For some facilities, parameters such as nutrients (nitrogen and phosphorus, which cause excess growth of algae and plants) or pH (a measure of acidity) are also regulated.

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

Compliance for the harbour WWTFs is measured on monthly averages. There has been a significant improvement in compliance at the five harbour WWTFs, with Herring Cove, Eastern Passage, and Mill Cove achieving full compliance for the year. Operational improvements have been underway at Halifax and Dartmouth and have been the reason for some of the non-compliance results throughout the year. Of the nine community-based facilities, six were fully compliant all year.

Wastewater Treatment Facility Compliance Summary
Q1 - April to June 2022

WWTF	$CBOD_5$	TSS	E. coli	Phosphorus	Ammonia	pH	Dissolved Oxygen	Chlorine	Toxicity Pass
Aerotech	2	1	10	0.1	0.1	6.9	7.7	n/a	YES
Frame	4	1	10	n/a	n/a	6.7	n/a	n/a	n/a
Lakeside-Timberlea	5	19	12	1	2	7.0	n/a	0.10	YES
Lockview-MacPherson	6	12	10	0.4	6.3	6.8	n/a	n/a	n/a
Middle Musquodoboit	7	15	67	n/a	n/a	7.2	n/a	n/a	n/a
North Preston	7	3	10	0.5	0.3	6.6	n/a	n/a	n/a
Springfield	5	6	19	n/a	n/a	7.0	n/a	n/a	n/a
Steeves (Wellington)	3	2	10	0.1	0.05	7.2	n/a	n/a	n/a
Uplands Park	6	12	10	n/a	n/a	7.1	n/a	n/a	n/a

Wastewater Treatment Facility Compliance Summary
Q2 - July to September 2022

WWTF	$CBOD_5$	TSS	E. coli	Phosphorus	Ammonia	pH	Dissolved Oxygen	Chlorine	Toxicity Pass
Aerotech	6	1	10	0.06	0.1	7.4	7.5	n/a	YES
Frame	4	1	10	n/a	n/a	7.3	n/a	n/a	n/a
Lakeside-Timberlea	6	17	11	1	3	7.5	n/a	0.10	YES
Lockview-MacPherson	8	5	19	0.4	3	6.6	n/a	n/a	n/a
Middle Musquodoboit	4	7	10	n/a	n/a	7.5	n/a	n/a	n/a
North Preston	5	2	10	1.3	0.1	6.6	n/a	n/a	n/a
Springfield	4	6	31	n/a	n/a	7.1	n/a	n/a	n/a
Steeves (Wellington)	5	1	10	0.1	0.05	7.6	n/a	n/a	n/a
Uplands Park	11	21	16	n/a	n/a	6.9	n/a	n/a	n/a

Specific parameter limit achieved
Specific parameter limit not achieved

NOTES & ACRONYMS:
$CBOD_5$ - Carbonaceous 5-Day Biochemical Oxygen Demand
TSS - Total Suspended Solids
TRC - Total Residual Chlorine
S / W - Summer / Winter compliance limits
Toxic may indicate only a single sample
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, Middle Musquodoboit, Belmont, Frame, BLT, Uplands, Springfield
NSECC requires an annual averages be less than the NSECC Compliance Limit for each parameter at North Preston, Steeves

Wastewater Treatment Facility Compliance Summary
Q3 - October to December 2022

WWTF	$CBOD_5$	TSS	E. coli	Phosphorus	Ammonia	pH	Dissolved Oxygen	Chlorine	Toxicity Pass
Aerotech	3	1	10	0.05	0.1	7.1	8.1	n/a	YES
Frame	4	1	10	n/a	n/a	7.3	n/a	n/a	n/a
Lakeside-Timberlea	5	16	34	1	1	7.1	n/a	0.10	YES
Lockview-MacPherson	5	6	34	0.3	3	6.5	n/a	n/a	n/a
Middle Musquodoboit	7	5	31	n/a	n/a	7.1	n/a	n/a	n/a
North Preston	4	20	10	1.2	0.3	6.6	n/a	n/a	n/a
Springfield	4	5	44	n/a	n/a	6.6	n/a	n/a	n/a
Steeves (Wellington)	2	14	10	0.5	0.1	7.0	n/a	n/a	n/a
Uplands Park	7	9	10	n/a	n/a	7.0	n/a	n/a	n/a

Wastewater Treatment Facility Compliance Summary
Q4 - January to March 2023

WWTF	$CBOD_5$	TSS	E. coli	Phosphorus	Ammonia	pH	Dissolved Oxygen	Chlorine	Toxicity Pass
Aerotech	3	1	10	0.1	0.1	7.0	8.1	n/a	YES
Frame	2	1	10	n/a	n/a	7.2	n/a	n/a	n/a
Lakeside-Timberlea	4	16	10	1	3	7.1	n/a	0.10	YES
Lockview-MacPherson	8	14	79	0.6	12	6.6	n/a	n/a	n/a
Middle Musquodoboit	16	13	108	n/a	n/a	7.1	n/a	n/a	n/a
North Preston	2	3	10	0.3	0.1	6.3	n/a	n/a	n/a
Springfield	5	8	10	n/a	n/a	7.2	n/a	n/a	n/a
Steeves (Wellington)	2	1	10	0.1	0.1	7.0	n/a	n/a	n/a
Uplands Park	9	9	22	n/a	n/a	6.8	n/a	n/a	n/a

Specific parameter limit achieved
Specific parameter limit not achieved

NOTES & ACRONYMS:
$CBOD_5$ - Carbonaceous 5-Day Biochemical Oxygen Demand
TSS - Total Suspended Solids
TRC - Total Residual Chlorine
S / W - Summer / Winter compliance limits
Toxic may indicate only a single sample
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, Middle Musquodoboit, Belmont, Frame, BLT, Uplands, Springfield
NSECC requires an annual averages be less than the NSECC Compliance Limit for each parameter at North Preston, Steeves

Wastewater Treatment Facility Compliance Summary

Monthly Performance - April 2022 to March 2023

Wastewater Treatment Facility	April 2022					May 2022					June 2022				
	$CBOD_5$	TSS	E. coli	pH	Toxicity Pass	$CBOD_5$	TSS	E. coli	pH	Toxicity Pass	$CBOD_5$	TSS	E. coli	pH	Toxicity Pass
Halifax	32	18	n/a	7	YES	42	19	1,426	7	YES	37	17	2,205	7	YES
Herring Cove	19	9	n/a	7	n/a	31	24	24	7	YES	21	14	31	7	n/a
Dartmouth	41	27	n/a	7	YES	49	16	38	7	YES	45	22	21	7	YES
Eastern Passage	7	7	n/a	7	n/a	7	11	61	7	YES	5	8	16	7	n/a
Mill Cove	18	19	15	7	n/a	15	14	23	7	YES	11	17	10	7	n/a

Wastewater Treatment Facility	July 2022					August 2022					September 2022				
	$CBOD_5$	TSS	E. coli	pH	Toxicity Pass	$CBOD_5$	TSS	E. coli	pH	Toxicity Pass	$CBOD_5$	TSS	E. coli	pH	Toxicity Pass
Halifax	37	18	3,206	7	YES	43	36	14,216	7	YES	47	22	24,664	7	NO
Herring Cove	28	11	45	7	n/a	48	13	50	7	YES	30	6	1,100	7	n/a
Dartmouth	54	20	131	7	YES	64	33	2,337	7	YES	68	21	2,345	7	NO
Eastern Passage	6	10	10	7	n/a	7	11	15	7	YES	11	13	31	7	n/a
Mill Cove	8	8	13	7	n/a	11	15	38	7	YES	11	12	29	7	n/a

Wastewater Treatment Facility	October 2022					November 2022					December 2022				
	$CBOD_5$	TSS	E. coli	pH	Toxicity Pass	$CBOD_5$	TSS	E. coli	pH	Toxicity Pass	$CBOD_5$	TSS	E. coli	pH	Toxicity Pass
Halifax	41	21	7,068	7	YES	39	22	n/a	7	YES	38	28	0	7	YES
Herring Cove	34	27	242	7	n/a	19	18	n/a	7	YES	13	19	18	6	n/a
Dartmouth	49	43	264	7	YES	42	29	n/a	7	YES	44	48	0	7	YES
Eastern Passage	8	6	20	7	n/a	7	11	n/a	7	YES	6	9	0	7	n/a
Mill Cove	11	11	14	6	n/a	13	15	19	7	YES	6	6	23	7	n/a

Wastewater Treatment Facility	January 2023					February 2023					March 2023				
	$CBOD_5$	TSS	E. coli	pH	Toxicity Pass	$CBOD_5$	TSS	E. coli	pH	Toxicity Pass	$CBOD_5$	TSS	E. coli	pH	Toxicity Pass
Halifax	29	21	n/a	7	YES	27	20	n/a	7	YES	43	34	n/a	7	YES
Herring Cove	16	21	n/a	7	n/a	19	18	n/a	7	YES	19	15	n/a	7	n/a
Dartmouth	38	39	n/a	7	YES	43	42	n/a	7	YES	40	22	n/a	7	YES
Eastern Passage	8	10	n/a	7	n/a	8	20	n/a	7	YES	9	11	n/a	7	n/a
Mill Cove	10	16	11	7	n/a	12	17	10	7	YES	11	16	12	7	n/a

Compliance Achieved (< NSECC Limit)

Compliance not Achieved (> NSECC Limit)

n/a Due to seasonal disinfection & toxicity requirements

People

We attract and retain high-quality team members in an inclusive and respectful work environment. We are committed to our customers and the communities where we live and work, determined to provide a high level of service and a sustainable future through ongoing engagement

Diversity, Equity & Inclusion

Halifax Water's Diversity, Equity, and Inclusion (DEI) focus for the 2022/23 fiscal year was DEI-based training and establishing related policies. In addition, accessibility is at the forefront as the new Burnside location is being developed.

In June 2022, through the assistance of Ashanti Leadership & Professional Development Services, 98% of our employees were trained in Unconscious Bias. In February 2023, CUPE conducted Respect in the Workplace training for 87% of our employees. Training will continue to be a focus as we expand our DEI training suite and catch up on training new employees in Unconscious Bias. In addition, we continue our Diversity Learning Moments.

We had remarkable success training ten future leaders from the union and non-union employee groups in our first Aspiring Leaders Performance Matters Supervisory Training; a second session will be held soon.

The DEI Policy was developed, and the Fair Hiring Policy was updated, which will be rolled out to employees during the fall of 2023.

The DEI Committee was refocused and expanded to represent all equity-seeking groups within Halifax Water better, and through collaboration with this committee, the DEI-related employee survey questions were created. The Women in Non-Traditional Trades came together to assist in the creation of survey questions for our Women of Water (WoW), which will help develop an education and awareness campaign to further attract and retain members of equity-seeking groups to Halifax Water.

Employees gathered for in-person and virtual coffee breaks to celebrate International Women's Day, and for the first time, Halifax Water participated in the PRIDE parade.

It was a busy year moving the DEI Framework Goals forward, and many more initiatives are in place for the upcoming fiscal year.

Talent Management

Ensuring that Halifax Water's institutional capacity to deliver existing programs and services and the increased capital investment under the Integrated Resource Plan continues to be an area of focus. Maintaining appropriate staff and resource levels is critical to providing our customers with high-quality and sustainable water services.

The current average turnover rate at Halifax Water is 7.74%, which is an overall increase of 6.74% from previous years.

Several experienced managers and employees retired in the last fiscal year. Currently, 6.1% of the workforce is eligible to retire. The percentage eligible to retire over the next five years has increased to 17.1%.

Halifax Water has a Talent Management program to help employees develop and progress their careers. Some initiatives planned for the upcoming year to help ensure there are internal candidates ready to take on new roles include:

- Promote the employee development guide frequently and introduce it during the onboarding of all new hires.
- Introducing the Diversity and Inclusion Fair Hiring Policy.
- Continue to provide supervisory training "Performance Matters" to include unionized employees who aspire and take the initiative to progress into supervisory roles in future.
- Continue to promote the training and development and Lifelong Learning initiatives available to all employees.
- Continue to develop a culture where feedback is welcomed and well received.

There has been an increase in attraction concerns in the last half of the 2022-23 fiscal year throughout the organization. Some concerning areas are Procurement,

Accounting, Finance, Water Treatment, Human Resources and Engineering Technologists.

Halifax Water maintains a competitive total compensation package. Some initiatives this year to help with attraction and retention issues:

- Introducing the Diversity and Inclusion Fair Hiring Policy.
- Introducing optional life and critical illness insurance offerings.
- Increasing resources in the Human Resources department.
- Re-alignment of the Engineering and Technology Services department.
- Completion of a unionized job evaluation review process.
- Continue to update and re-evaluate job descriptions as required and benchmark compensation against the market.
- Promote the awards recognition program
- Collective Bargaining.

One Water Excellence Awards

This year was the first year of the Halifax Water One Water Excellence Awards. In addition to our highly regarded Carolyn Bruce Excellence in Customer Service Award, we have added three additional award categories to recognize employees who have made significant contributions to Safety & Environment, True Value and Team Spirit.

2022 Holiday Awards Banquet

One Water Excellence Awards

Carolyn Bruce Customer Service Excellence Award

In 2012, Halifax Water introduced a new Customer Service Excellence Award in honour and memory of Carolyn Bruce. This award was created to recognize the path that Carolyn forged for exemplary Customer Service. Carolyn was a dedicated employee of 22 years, starting as a Customer Service Representative and moving her way up to Customer Service Supervisor. Carolyn passed away in 2011, leaving a legacy of passionate, dedicated service to Halifax Water.

We continue to recognize employees demonstrating this passion and dedication to Customer Service. Each year, Halifax Water takes nominations from employees who wish to recognize their coworkers for this award. Considerations for this award include the number of times an employee is recognized for providing excellent customer service to our external customers, the breadth and depth of customer service (impact to the utility), customer service over and above the call of duty (beyond their job requirement and a pattern of exemplary customer service over an extended period-of-time.)

Barry Geddes Receiving the Carolyn Bruce Customer Service Excellence Award

Continuing Carolyn's legacy, in 2022, Halifax Water recognized Barry Geddes for his excellent customer service and presented him with the Carolyn Bruce Customer Service Excellence Award. Barry is Halifax Water's Watershed Manager and has been a dedicated employee since 2006. His name was added to the perpetual plaque at 450 Cowie Hill Road, along with the others before him, as a reminder of Halifax Water employees' passion and dedication.

Halifax Water Service Awards

Employee commitment and dedication of service mean a great deal to Halifax Water, and to show that appreciation, Halifax Water has a long-standing tradition of recognizing employees for their length of service with the organization. Awards categories to recognize this service are five, 10, 15, 20, 25, 30 and 35 years. As per Halifax Water's Service Award Policy, eligible employees will have their years of continuous service completed by the end of the calendar year the award was received.

In 2022, we recognized the following employees for reaching their service milestone! Awards categories from 10-35 were presented to employees at the 2022 Service Awards Banquet & Holiday Party held at the Westin Nova Scotian Hotel on Friday, December 16.

35 Years of Service

Operations
Graham Downey

30 Years of Service

Engineering & Technology Services
Harold MacNeil

Operations
Stephen Murphy

Regulatory Compliance Services
Shawn MacDonald

25 Years of Service

Corporate Services
Denise MacDonald

General Manager
Rochelle Bellemare
Maria MacKinnon

Operations
George Bent
Paul Sutherland
Reid Kaiser
Shawn Taylor
Sheldon Parsons

20 Years of Service

Operations
Adam Greer
Rachel Dauphinee
Robert Piercey
Stewart Martin

15 Years of Service

Corporate Services
Christine Westhaver
Kimberley Kavanaugh

Engineering & Technology Services
Alan Ghothani
Chantel Parkin
Daniel Kennie
Jaclyn Chezenko
Roger Levesque

Operations
Colette Clark
John Eisnor
John Russell
Laurena MacDonald
Mark Feener
Neil Grady
Troy Blackmore

10 Years of Service

Corporate Services
Anne Oickle
Brent Hickman
Leslie Mills
Rocio Barreiro

Engineering & Technology Services
Arsanious Awadalla
Chris White
Danielle Semel
David Blades
Dylan Roache
Michael Duggan
Sonya LeVangie

Operations
Charles Thomas
Cliff Goodhew
Craig Young
Daniel Hooper
Graham Heggelin
Jacob Mackereth
Kelly Sangster
Mason Willis
Michael Murphy
Robert Graham
Scott Lovatt

Regulatory Compliance Services
Caitlin Daly

5 Years of Service

Corporate Services
Renee Strickland

Engineering & Technology Services
Carly Wrathall
Franklyn King
Sean Ryan
Mila Cox
Michael Frenette

General Manager
David Jones

Operations
Andrew Pulsifer
Benjamin Wallace
Bruce Day
Cory Carlton
Cory Millett
Cory Venedam
David Snow
Dylan Litle
Joel O'Neil
Jonathan Cann
Justine Corey
Peter Lord
Ryan Boyd
Scott Low
Shane Young
Wendy Krkosek

Regulatory Compliance Services
Alanna Wood
Johannah Convey
Kelly MacKinnon
Sanjoli Tagra

Fundraising & Volunteering

Halifax Water employees take great pride in the communities we live in and serve. Employees can get involved in several different fundraising events, volunteer groups, and community causes throughout the year.

United Way Halifax
Halifax Water employees have been helping support United Way Halifax for over 24 years. Halifax Water employees proudly pitched in and raised a total of $4,126!

Water for People
Halifax Water employees donated $10,566 to Water for People. These funds support the digging of wells to provide clean drinking water for approximately 4 million people in nine different countries.

Angel Toy Drive Present Pickup

Angel Tree Toy Drive
For more than ten years, it has been a tradition for Halifax Water employees to continue the Angel Tree Program to provide gifts for less fortunate children in our community.

Employees provided gifts for over 100 children, from newborns to 11 years old, and thanks to the giving spirit of Halifax Water employees, they will get something special on Christmas Morning!

Sponsorships & Donations

Halifax Pride
Halifax Water was proud to sponsor the 2022 Halifax Pride Festival and take part in the Pride Parade. Halifax Water is committed to diversity, equity, and inclusion in the workplace. Staff were thrilled to show our pride in the parade.

Halifax Water Halifax Pride Parade Participants

Special Olympics Nova Scotia
Halifax Water fleet operators showed pride in their trucks as they volunteered to participate in the Special Olympics Nova Scotia Truck Convoy. The Truck Convoy is a way to raise money for the Special Olympics NS; this year, Halifax Water was a Silver Level Sponsor of the event and was proud to have its fleet involved this year.

Purple Ribbon Campaign
In recognition and support of The Purple Ribbon Campaign, a movement to raise awareness of violence against women, Halifax Water employees came together and donated a total of over $400 worth of gift cards. These gift cards were given to the women at the Transition House Association of Nova Scotia, transitional homes empowering women to get the things they need to move forward.

H2O Fund
The H2O (Help to Others) Fund is a water, wastewater, and stormwater assistance fund that can be used by Halifax Water residential customers who are having difficulty making their bill payments.

Approved applicants will receive assistance once in 24 months to a maximum of $275.00. The Salvation Army administers this program on behalf of Halifax Water.

Halifax Water's H2O Fund is funded by donations from Halifax Water employees throughout the year. Halifax Water matches these donations to a maximum of $27,500 annually. This year, Halifax Water employees donated $5,788 through payroll deductions.

NSCC Scholarships

Halifax Water is an active supporter of the educational growth of our community through scholarships provided to the Nova Scotia Community College. Since 2008, Halifax Water has offered over $111,000 in scholarships for NSCC students, with accompanying work-terms. The scholarships not only benefit the community and recipients, but they have also provided Halifax Water with many highly skilled and motivated employees over the years:

Jipuktuk etli apatua'timk Award - $4,000 Awarded each fall & spring
Halifax Water established it to support First Nations, Métis and Inuit students entering the Civil Engineering Technology, Environmental Engineering Technology, Electronic Engineering Technology, or Mechanical Engineering Technology Programs at NSCC.

jipuktuk etli apatua'timk is the Mi'kmaq word for harbour or port and has been used to describe Halifax Harbour by the Mi'kmaq people in Nova Scotia.

Arnold D. Johnson Sr. Award for Water Resources - $3,600 Awarded each fall
Halifax Water established it to support Indigenous African Nova Scotian students entering Environmental Engineering Technology or Mechanical Engineering Technology Programs at NSCC.

Named in honour of Arnold D. Johnson Sr., who served the Preston area communities as a Halifax County Councillor and was instrumental in creating the Watershed Association Development Enterprise and the Lake Major Watershed Advisory Committee, the award recognizes the foresight and dedication of Mr. Johnson during his many years of public service and his many accomplishments.

Robert T. Peacock Achievement Award - $2,000 Awarded each fall
Established by Halifax Water to support students who self-identify as racially visible entering their second year of the Environmental Engineering Technology Program at NSCC.

This award includes an opportunity for the successful recipient to complete their required work term with Halifax Water.

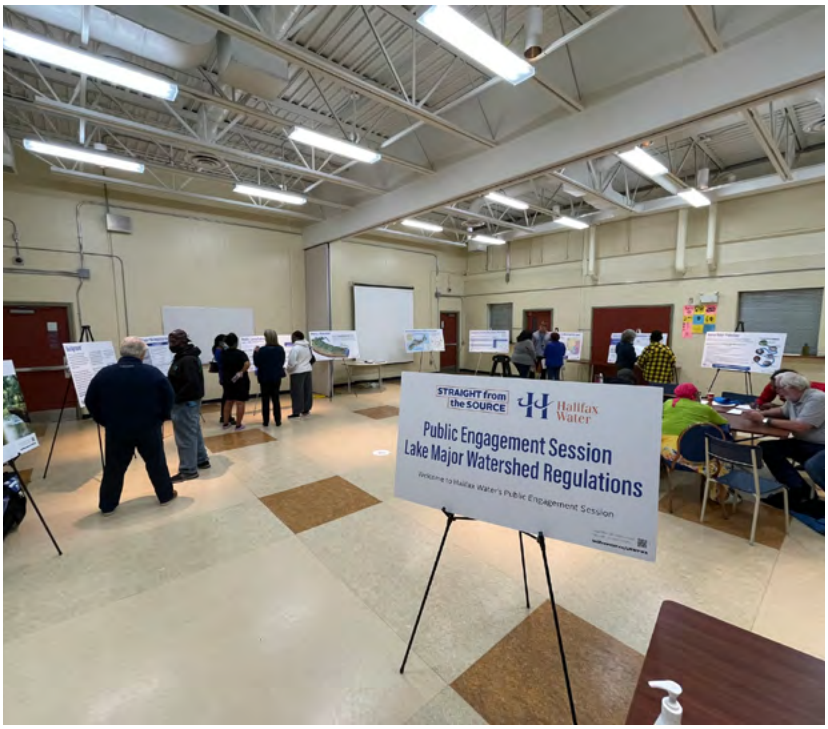
Women in Non-Traditional Careers - $2,000 Awarded each fall
This award is open to women in non-traditional careers who are entering one of the eligible NSCC Programs listed. Included with this award is an opportunity for the successful recipient to complete their required work placement with Halifax Water, as well as an opportunity for summer employment with Halifax Water.

Halifax Water Achievement Award - $2,000 Awarded each fall
This award is open to any student enrolled full-time In the Civil Engineering Technology Program at NSCC. This award includes an opportunity for the successful recipient to complete their required work term with Halifax Water.

Community Engagement Activities

Halifax Water is committed to communicating with and engaging with our stakeholders. Below is a summary of stakeholder and community engagement activities that took place during the 2022/23 fiscal year:

Lake Major Watershed Protected Water Area Regulation Engagement Sessions
Halifax Water hosted 17 public engagement sessions with property owners in September and October 2022 at the East Preston Recreation Centre, Lake Echo Community Recreation Centre, North Preston Community Centre, Fairbanks Centre, Woodlawn United Church, and online. These informal walk-in sessions included a number of information boards, allowing community members to walk through and learn more about the designated Lake Major Watershed Protected Water Area and the current regulations and to speak with representatives from Halifax Water if they had any questions.



Lake Major Watershed Public Engagement Session

Stormwater Service Expansion
In winter 2022, Halifax Water offered two online community information sessions for property owners within the proposed stormwater expansion area.

RDC & Development
In May 2022, Halifax Water hosted an breakfast event with the development community to present on how RDC funds are used, why they are collected, and the collective benefit to the region that these funds bring.

Halifax Water also attended the 2022 Urban Development Institute of Nova Scotia Fall Conference to engage with the local development community.

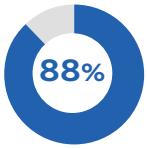
Port Wallace Utility Corridor
Halifax Water hosted a public information session at the Fairbanks Centre regarding the installation of a utility corridor that will support water and wastewater services for growth in the Port Wallace master plan area. This work includes the replacement of a bridge crossing the Shubenacadie Canal.

2023 Spring Ideal Home Show
Halifax Water had staff from various departments at the 2023 Spring Ideal Home Show to help property owners better understand related topics, such as development, permits, service connections, billing, and more.

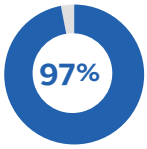
Halifax Water
2022 Quality of Service
Key Highlights

Methodology: 332 telephone surveys with Halifax residents (310 Water customers, 198 Stormwater Customers, and 227 Wastewater Customers)
Data Collection: November 8 - 20, 2020

Halifax Water Customers



88% rate quality of water received in household as excellent / good.
(vs. 89% in 2021)



97% rate their water as very/generally safe.
(vs. 98% in 2021)

Customer Service Index
80.5%
(vs. 79.5 in 2021)

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

49% **Internet**
(vs. 55% in 2021)

22% **Halifax Water website**
(vs. 20% in 2021)

Among Water Customers

Very/generally satified with Halifax Water staff's...

Service Reliability 98%
(vs. 93% in 2021)

Politeness 94%
(vs. 92% in 2021)

Ability to answer questions 86%
(vs. 86% in 2021)

Accessibility 85%
(vs. 87% in 2021)

Promptness 84%
(vs. 86% in 2021)

97%
Very/generally satisfied with Halifax Water's overall service delivery
(vs. 96% in 2021)
(Amoung those who receive Water Services)

84%
Very/generally satisfied with Stormwater Services received from Halifax Water
(vs. 79% in 2021)
(Amoung those who receive Stormwater Services)

92%
Very/generally satisfied with Wastewater Services received from Halifax Water
(vs. 93% in 2021)
(Amoung those who receive Wastewater Services)

Program Awareness

16% Aware of Halifax Water's enhanced program to assist residential customers with replacing their lead water service lines.
(vs. 25% in 2021)

14% Aware that Halifax Water has an emergency assistance program to help low income customers.
(vs. 16% in 2021)

Currently Using Customer Connect Portal

Not using 79%

38% Very/somewhat interested in managing their Halifax Water account online
(vs. 42% in 2021)

68% Would definitely/ probably sign up for paperless billing
(vs. 70% in 2021)

Using 17%

Online Services Used on Customer Connect Portal

92% Managing your account information
(vs. 87% in 2021)

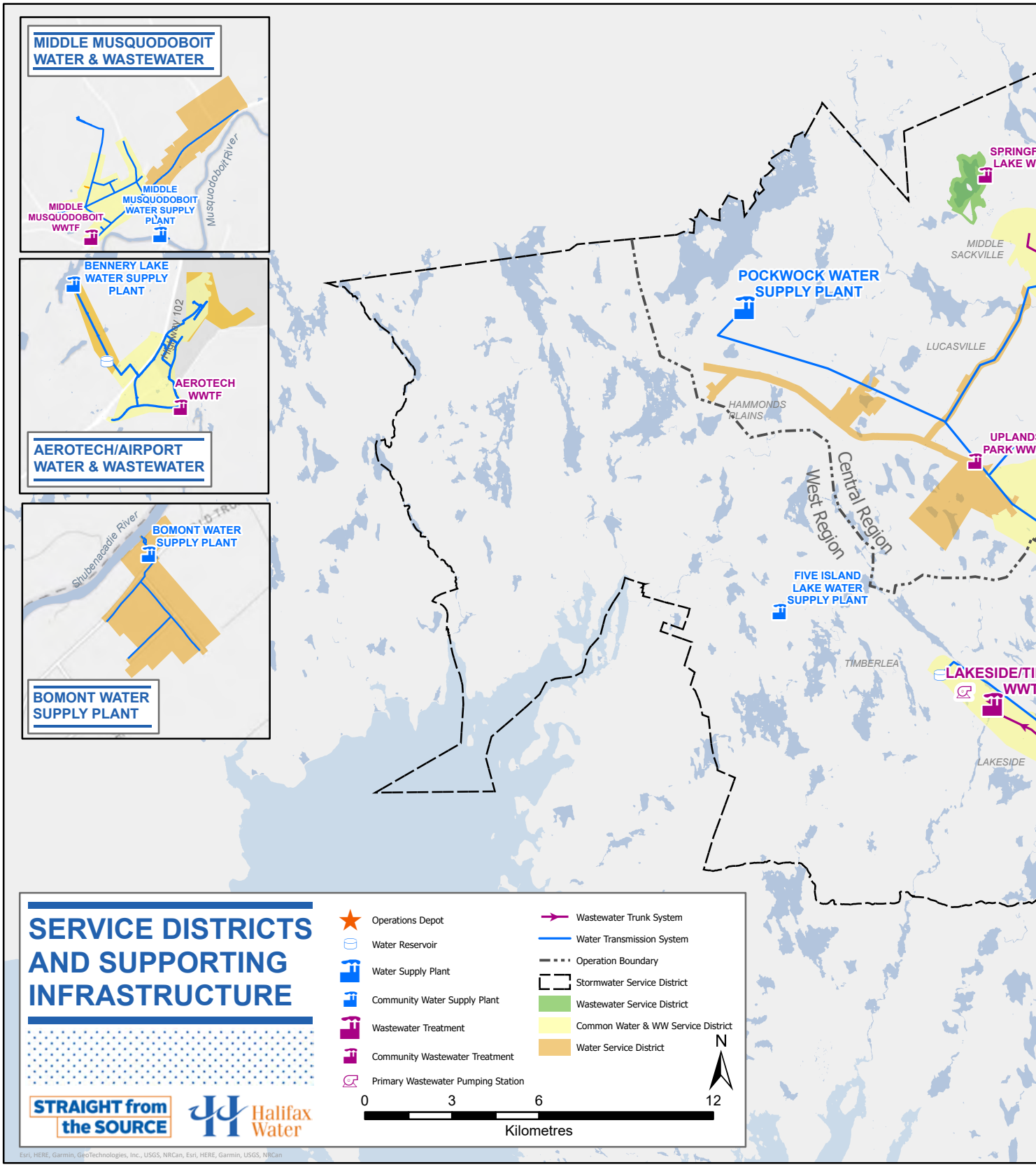
88% Tracking billing
(vs. 84% in 2021)

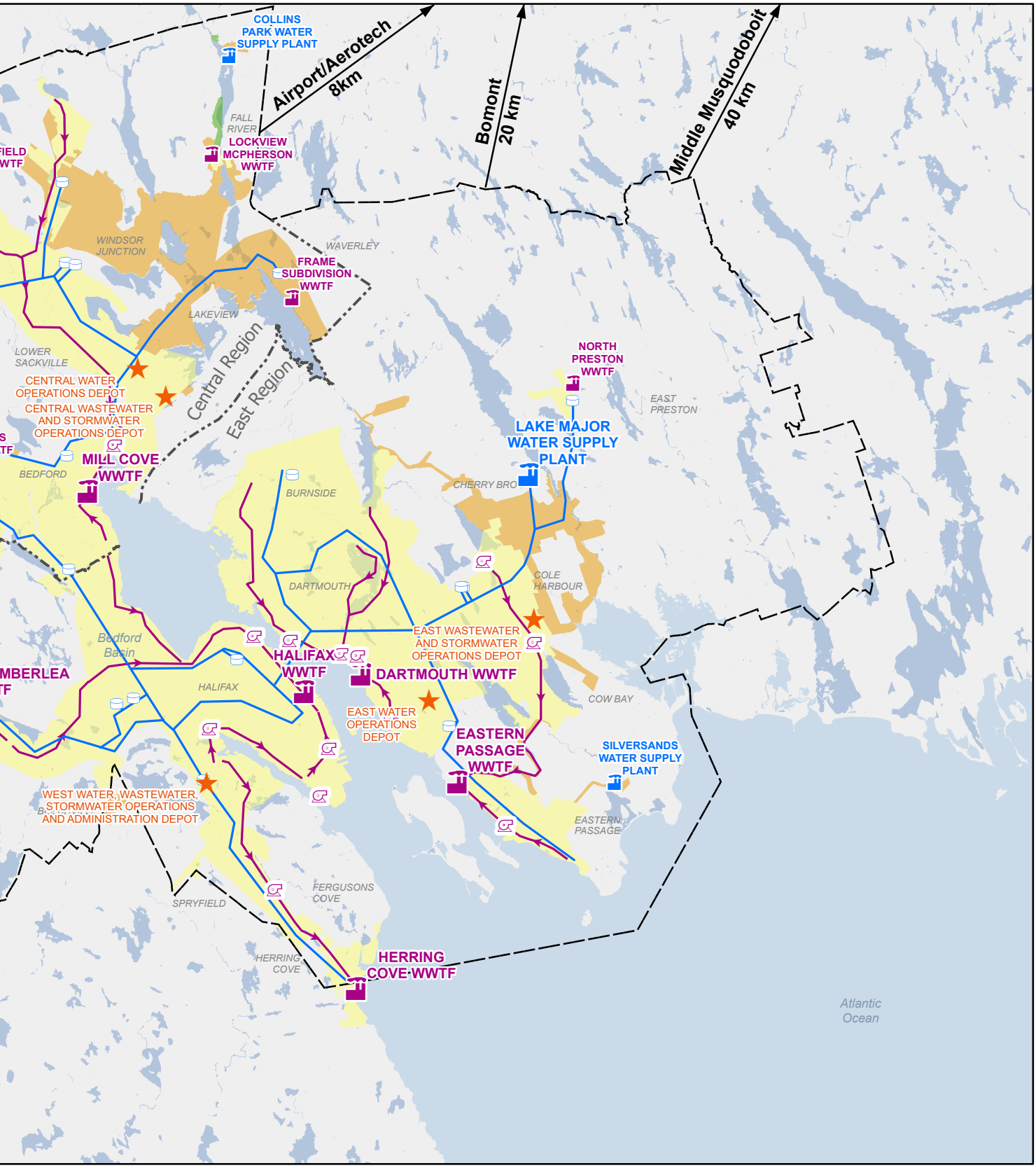
52% Monitoring your water consumption
(vs. 57% in 2021)

Unless otherwise noted percentages represent Halifax Water Customers. | *Asked of HRM residents (n=400)

Halifax Water

Service Area Map




COLLINS PARK WATER SUPPLY PLANT
Airport/Aerotech 8km
Bomont 20 km
Middle Musquodoboit 40 km
FALL RIVER
LOCKVIEW MCPHERSON WWTF
WINDSOR JUNCTION
WAVERLEY
FRAME SUBDIVISION WWTF
LAKEVIEW
LOWER SACKVILLE
CENTRAL WATER OPERATIONS DEPOT
CENTRAL WASTEWATER AND STORMWATER OPERATIONS DEPOT
Central Region
East Region
MILL COVE WWTF
BEDFORD
BURNSIDE
DARTMOUTH
Bedford Basin
HALIFAX
HALIFAX WWTF
DARTMOUTH WWTF
EAST WASTEWATER AND STORMWATER OPERATIONS DEPOT
EAST WATER OPERATIONS DEPOT
EASTERN PASSAGE WWTF
WEST WATER, WASTEWATER, STORMWATER OPERATIONS AND ADMINISTRATION DEPOT
SPRYFIELD
FERGUSONS COVE
HERRING COVE
HERRING COVE WWTF
NORTH PRESTON WWTF
EAST PRESTON
LAKE MAJOR WATER SUPPLY PLANT
CHERRY BRO
COLE HARBOUR
COW BAY
SILVERSANDS WATER SUPPLY PLANT
EASTERN PASSAGE
Atlantic Ocean

Halifax Water by the Numbers

General Utility Information - Water Infrastructure
as of March 31, 2023

Water Supply Plant	Water Source	Treatment Process	Average Flows/Day	Filter Quantity & Capacity/Day	Maximum Flow Rate	Design Capacity/Day
J. D. Kline	Pockwock Lake	Dual Media Direct Filtration & Manganese Removal	91,583 m^3	8 Filters 143 m^2/filter	0.137 m^3/m^2 per minute	227,000 m^3
Lake Major	Lake Major	Upflow Clarification, Iron & Manganese Removal	32,270 m^3	4 Filters 85 m^2/filter	0.192 m^3/m^2 per minute	94,000 m^3
Bennery Lake	Bennery Lake	Sedimentation, Dual Media Filtration & Manganese Removal	806 m^3	2 Filters 26.65 m^2/ filter	0.10 m^3/m^2 per minute	7,950 m^3
Middle Musquodoboit	Musquodoboit River	Raw Water Infiltration Gallery, Ultra/ Nano Filtration	53 m^3	2 Ultra Filters 1 Nano Filter	0.139 m^3/min 0.264 m^3/min	260 m^3
Collins Park	Lake Fletcher	Ultra/Nano Filtration	63 m^3	2 Ultra Filters 1 Nano Filter	0.111 m^3/min 0.145 m^3/min	160 m^3
Bomont	Shubenacadie River	Nano Filtration/ Ionic Exchange Resin	2 m^3	N/A	0.0132 m^3/ min	38 m^3
Silver Sands	2 Wells	Green Sand Pressure Filters, Iron & Manganese Removal	20 m^3	2 Filters	0.378 m^3/min	30 m^3
Five Island Lake	1 Well	UV Disinfection	11 m^3	N/A	0.016 m^3/min	N/A

Source Water	Rainfall in 2022/23	Snowfall in 2022/23
Pockwock Lake	1,695.58 mm	127.0 cm
Lake Major	1,483.7 mm	78.3 cm

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

Water Supply	Water Production in 2022/23 (m^3)
Pockwock Lake	33,427,807
Lake Major	11,778,710
Bennery Lake	294,341
Small Systems	53,893
Total	**45,554,751**

Reservoir	Elevation Above Sea Level	Capacity
Lake Major	60 m	9,092 m^3
Pockwock	170 m	13,600 m^3
Geizer 158	158 m	36,400 m^3
Geizer 123	123 m	31,800 m^3
Cowie	113 m	11,200 m^3
Robie	82 m	15,900 m^3
Lakeside	119 m	5,455 m^3
Mount Edward 1	119 m	22,728 m^3
Mount Edward 2	119 m	22,728 m^3
Akerley Blvd.	119 m	37,727 m^3
Akerley Blvd.	125 m	1,659 m^3
Meadowbrook	95 m	9,091 m^3
Sampson	123 m	12,273 m^3
Stokil	123 m	23,636 m^3
Waverley	86 m	1,364 m^3
Middle Musq.	81 m	275 m^3
Aerotech	174 m	4,085 m^3
Beaver Bank	156 m	6,937 m^3
Hemlock	123 m	21,500 m^3
Total		**287,450 m^3**

Transmission & Distribution System	
Size of Water Mains	19 mm - 1,500 mm
Total Water Mains	1,580 KM
Main Valves	15,827
Fire Hydrants	8,550
Distribution Pumping (Booster) Stations	20
Pressure Control & Flow Meter Chambers	143

Water Services & Meters	
Water Sprinkler Systems (25 mm - 300 mm)	2,361
Supply Services (10 mm - 400 mm)	87,281
Water Meters (15 mm - 250 mm)	87,335

Population Served	
Halifax Municipality Est. Population Served	412,000
Consumption per Capita	223.78 litres/day

General Utility Information - Wastewater & Stormwater Infrastructure

as of March 31, 2023

Wastewater Treatment Facility	Treatment Process	Design Average Flows/Day	Area(s) Served	Receiving Water	Volume Treated in 2022/23
Halifax	Enhanced Primary UV	139,900 m^3	Halifax	Halifax Harbour	33.397.803 m^3
Dartmouth	Enhanced Primary UV	83,800 m^3	Dartmouth	Halifax Harbour	18,895,112 m^3
Herring Cove	Enhanced Primary UV	28,500 m^3	Halifax & Herring Cove	Halifax Harbour	4,187,113 m^3
Mill Cove	Secondary UV/Pure Oxygen Activated Sludge	28,400 m^3	Bedford & Sackville	Bedford Basin	9,564,154 m^3
Eastern Passage	Secondary UV/ Conventional Activated Sludge	25,000 m^3	Cole Harbour & Eastern Passage	Halifax Harbour	5,238,467 m^3
Timberlea	Secondary Sodium Hypochlorite/RBC	4,540 m^3	Lakeside & Timberlea	Nine Mile River	898,472 m^3
Aerotech	Tertiary UV/Membrane Bioreactors	3,000 m^3	Aerotech Park & Airport	Johnson River	331,084 m^3
Springfield Lake	Secondary UV/Activated Sludge	543 m^3	Springfield Lake	Lisle Lake	150,966 m^3
Fall River	Tertiary UV/Activated Sludge & Post Filtration	454.5 m^3	Lockview Road & McPherson Road	Lake Fletcher	65,560 m^3
North Preston	Tertiary UV/SBR & Engineered Wetland	680 m^3	North Preston	Winder Lake	226,777 m^3
Middle Musquodoboit	UV/RBC	114 m^3	Middle Musquodoboit	Musquodoboit River	56,945 m^3
Uplands Park	Secondary UV/Trickling Filter & Wetland	91 m^3	Uplands Park	Sandy Lake	34,832 m^3
Wellington	Tertiary UV/Activated Sludge/Reed Bleed	68 m^3	Wellington	Grand Lake	5,923 m^3
Frame Subdivision	Tertiary UV/Membrane Reactor	80 m^3	Frame Subdivision	Lake William	8,343 m^3

Wastewater & Stormwater Collection System	
Size of Pipes	38 mm - 3,000 mm
Total Collection System Length	2,313 KM
Wastewater Services	82,901
Total Manholes	38,921
Total Pumping Stations	165
Total Ditch Length	602 KM
Holding Tanks & Retention Ponds	45
Cross Culverts	2,737
Driveway Culverts	17,556
Catchbasins	25,485

Corporate Balanced Scorecard Results

Since 2001, Halifax Water has been measuring organizational performance using a Corporate Balanced Scorecard (CBS). The CBS ensures that all employees are focused on strategic outcomes. The Organizational Indicators below are developed to support the Halifax Water purpose statement: to supply and safeguard sustainable, high-quality water services.

Organizational Indicators	Organization Award	2021/22 Results	2022/23 Target	2022/23 Results	2023/24 Target
Financial and Regulatory Accountability					
Operating expense/revenue ratio percentage	Gateway	81.2%	83%	82.4 %	80%
ADJUSTED Operating expense/revenue ratio percentage (excluding depreciation)	Gateway	61.4%	63%	62.0%	60%
Annual Cost per customer connection - Water		$540	$543	$539	$579
ADJUSTED Annual Cost per customer connection – Water (excluding depreciation)		$412	$407	$403	$438
Annual cost per customer connection – Wastewater		$741	$782	$786	$830
ADJUSTED Annual cost per customer connection – Wastewater (excluding depreciation)		$554	$595	$592	$627
NEW Total capital spend in the fiscal year				$93.5M	$135M
Capital Budget Expenditures – Percentage of budget spend by end of fiscal year		28.6%	70-80%	35.3%	70-80%

Organizational Indicators	Organization Award	2021/22 Results	2022/23 Target	2022/23 Results	2023/24 Target
Health, Safety & Environment					
Average Score on internal safety audits		96.7 %	85-95%	98%	90%
NS Labour and Advanced Education compliance – Number 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	Gateway	2	3.5	0.91	3
Safe driving – Number of traffic accidents per 1,000,000 km driven (maximum of 5)	Org. Award	3.36	4	4.31	4
Training – Number of employees trained or re-certified before due date		70%	80-90%	89%	85%
Percentage of completed safety talks		85%	80-90%	90%	85%
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 NSECC approval permits	Org. Award	96.2 %	95-100%	96.6%	95%
Number of ICI properties engagements by pollution prevention each year		361	250	251	250

Organizational Indicators	Organization Award	2021/22 Results	2022/23 Target	2022/23 Results	2023/24 Target
People					
Customer satisfaction about water quality - percentage from Customer Survey	Org. Award	89%	85%	88%	85%
Customer satisfaction with service - percentage from Customer Survey	Org. Award	96%	95%	97%	95%
Number of arbitrations divided by total number of grievances		0	0	0	0
Percentage of jobs filled with internal candidates		68%	80%	64%	80%
Employee satisfaction survey result		B+	A	B+	A
Average number of days absenteeism		7.16	<7	9.81	<7

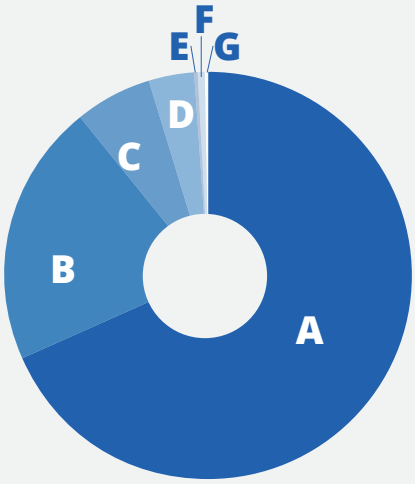
Organizational Indicators	Organization Award	2021/22 Results	2022/23 Target	2022/23 Results	2023/24 Target
Operational Excellence					
Adherence with 5 objectives of Water Safety Plan for all water systems – Percentage of sites achieving targets	Org. Award	70	80	93	80
Bacteriological tests – Percentage free from total coliform		99.94%	99.99%	99.97%	99.90%
Water service outages – Number of connection hours/1000 customers		192.42	200	125.74	200
Wastewater service outages – Number of connection hours/1000 customers		0.93	4	1.03	4
Average speed of answer – Percentage of calls answered within 20 seconds		60.4%	70%	71.1%	70%
NEW Response time for service connection permits – Percentage of formal responses provided from Halifax Water within 3 days or less		N/A	N/A	N/A*	80%
NEW Response time for subdivisions involving system extensions – Percentage of formal responses from Halifax Water provided within 4 weeks or less		N/A	N/A	N/A*	80%
Water leakage control – Target leakage allowance of 160 litres/service connection/day	Org. Award	220	160-170	219	165
I&I reduction - Number of inspections to identify private property discharge of stormwater into the wastewater system		1,502	1,200	1,387	1,200
Peak flow reduction from wet weather management capital projects	Org. Award	N/A*	5-10 l/ SEC*	N/A*	5-10 l/ SEC*
Percentage of time GIS and Cityworks are available	Org. Award	99.99%	96-98%	99.95%	97%
ADJUSTED Energy management kwh/m^3 reduction associated with capital projects	Org. Award	7.76%	3.00%	14.10%	10%
Bio-solids residual handling - percentage of sludge meeting bio-solids concentration targets	Org. Award	98.5%	92-97%	99.5%	95%

Corporate Balanced Scorecard Notes

* Peak Flow Reduction – The program has been completed, however the analysis of the flow data has not been completed by our external contractor. This measure will be updated when the data becomes available.

Customers by Service Type

Halifax Water provides one or more of the following to our customers: water, wastewater and/or stormwater services. Those services support an estimated population of 381,000 people and numerous visitors to the region.



Customers by Type	Number	% of Total
A. Water, Wastewater & Stormwater	76,056	68.5%
B. Stormwater Only	23,142	20.8%
C. Water & Wastewater	6,731	6.0%
D. Water & Stormwater	3,968	3.6%
E. Wastewater & Stormwater	534	0.5%
F. Water Only	526	0.5%
G. Wastewater Only	153	0.1%
Total	**111,110**	**100.0%**

TYPICAL ANALYSIS OF POCKWOCK LAKE & LAKE MAJOR WATER
2022/23
(in milligrams per litre unless shown otherwise)
Note: All regulatory compliance analysis are processed by third-party laboratories.

PARAMETERS	(Halifax) POCKWOCK		(Dartmouth) LAKE MAJOR		GUIDELINES FOR CANADIAN DRINKING WATER QUALITY	
	Raw Water	Treated Water	Raw Water	Treated Water	Maximum Acceptable Concentration	Aesthetic Objective Concentration
Alkalinity (as CaCO3)	<2.0	22.8	<2.0	23.6	-	-
Aluminum	0.106	0.024	0.213	0.015	2.9	[A]0.2/0.1
Ammonia (N)	<0.05	<0.05	<0.05	<0.05	-	-
Arsenic	<0.001	<0.001	<0.001	<0.001	0.010	-
Calcium	0.95	6.95	1.02	17	-	-
Chloride	7.2	8.05	6.1	8.246	-	≤250
Chlorate	<0.1	<0.1	<0.1	<0.1	1.0	-
Chlorite	<0.1	<0.1	<0.1	<0.1	1.0	-
Colour (True Colour Units)	15.8	<0.5	42	<0.5	-	≤15.0
Conductivity (µS/cm)	34	91	34	146	-	-
Copper (Total)	0.052	<0.0005	0.03	0.001	2.0	≤1.0
Fluoride	<0.1	0.488	<0.1	[B]<0.1	1.5	-
Hardness (as CaCO3)	4.1	18.8	4	43	-	-
HAA5 (avg.)	-	0.009	-	0.027	0.080	-
Iron (Total)	0.065	<0.05	0.136	<0.05	-	≤0.3
Lead (Total) (µg/l)	<0.5	<0.5	<0.5	<0.5	5.0	-
Magnesium	0.39	0.395	0.393	0.39	-	-
Manganese (Total)	0.03	0.008	0.035	<0.002	0.12	≤0.02
Mercury (µg/l)	<0.013	<0.013	<0.013	<0.013	1.0	-
Nitrate (as N)	<0.05	<0.05	<0.05	<0.05	10.0	-
Nitrite (as N)	<0.01	<0.01	<0.01	<0.01	1	-
pH (pH Units)	6	7.4	5.8	7.3	-	7.0 - 10.5
Potassium	0.23	0.27	0.21	0.22	-	-
Sodium	4.26	11	4.1	11.1	-	≤200
Solids (Total Dissolved)	17	50	22	90	-	≤500
Sulphate	2.18	11.39	2.57	33.47	-	≤500
Turbidity (NTU)	0.75	0.04	0.595	0.04	[C]0.15/0.2	-
Total Organic Carbon (TOC)	4.1	1.88	5.825	1.938	-	-
THMs (avg.)	-	0.0196	-	0.046	0.100	-
Uranium (µg/l)	<0.1	<0.1	0.116	<0.1	20.0	-
Zinc (Total)	<0.005	0.157	0.005	0.141	-	≤5.0
PCB (µg/l)	-	-	-	-	-	-
Gross Alpha / Gross Beta (Bq/L)	<0.1	<0.1	<0.1	<0.1	0.5 / 1.0	-

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

[B]Fluoride was not being added to the finished water at the Lake Major WSP approximately 75% of the time due to system maintenance.

[C]The Pockwock and Lake Major plants analyze turbidity immediately post-filtration. Each filter must produce water with a turbidity of <0.15 NTU 95% of the time at the Pockwock Water Supply Plant and <0.2 NTU 95% of the time at the Lake Major Water Supply Plant. Both Water Supply Plants must produce water with a turbidity <1.0 NTU 100% of the time, as required by Provincial Permit.

TYPICAL ANALYSIS OF BENNERY LAKE & BOMONT WATER
2022/23
(in milligrams per litre unless shown otherwise)
Note: All regulatory compliance analysis are processed by third-party laboratories.

PARAMETERS	BENNERY LAKE		BOMONT LAKE		GUIDELINES FOR CANADIAN DRINKING WATER QUALITY	
	Raw Water	Treated Water	[A]Raw Water	Treated Water	Maximum Acceptable Concentration	Aesthetic Objective Concentration
Alkalinity (as CaCO3)	4.6	24.1	-	24.3	-	-
Aluminum	0.121	0.013	-	0.022	2.9	0.1
Ammonia (N)	<0.05	<0.05	-	<0.05	-	-
Arsenic	<0.001	<0.001	-	<0.001	0.010	-
Calcium	2.6	19.0	-	7.3	-	-
Chloride	6.7	9.5	-	9.0	-	≤250
Chlorate	<0.1	0.3	-	0.2	1.0	-
Chlorite	<0.1	<0.1	-	<0.1	1.0	-
Colour (True Colour Units)	47.5	<5.0	-	<5.0	-	≤15.0
Conductivity (µS/cm)	39	156	-	104	-	-
Copper (Total)	0.2297	0.0517	-	0.0006	2.0	≤1.0
Fluoride	<0.1	<0.1	-	0.6	1.5	-
Hardness (as CaCO3)	7.6	47.0	-	20.0	-	-
HAA5 (avg.)	-	0.022	-	0.043	0.080	-
Iron (Total)	0.78	<0.05	-	<0.05	-	≤0.3
Lead (Total) (µg/l)	0.55	<0.5	-	<0.5	5.0	-
Magnesium	0.5	0.6	-	0.4	-	-
Manganese (Total)	0.437	0.050	-	0.0049	0.12	≤0.02
Mercury (µg/l)	<0.013	<0.013	-	<0.013	1.0	-
Nitrate (as N)	<0.05	<0.05	-	<0.05	10.0	-
Nitrite (as N)	<0.01	<0.01	-	<0.01	1	-
pH (pH Units)	6.5	7.3	-	7.6	-	7.0 - 10.5
Potassium	0.2	0.2	-	0.3	-	-
Sodium	4.4	10.8	-	12.5	-	≤200
Solids (Total Dissolved)	29	87	-	57	-	≤500
Sulphate	3.0	36.9	-	13.5	-	≤500
Turbidity (NTU)	2.59	0.04	-	0.21	[B]0.2/1.0; [C]5.0	-
Total Organic Carbon (TOC)	6.5	2.2	-	1.8	-	-
THMs (avg.)	-	0.038	-	0.028	0.100	-
Uranium (µg/l)	<0.1	<0.1	-	<0.1	20.0	-
Zinc (Total)	0.008	0.052	-	0.1425	-	≤5.0
PCB (µg/l)	-	-	-	-	-	-
Gross Alpha / Gross Beta (Bq/L)	<0.1	<0.1	-	<0.1	0.5 / 1.0	-

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

[B]The Bennery Lake plant analyzes turbidity immediately post-filtration and must produce water with a turbidity of <0.2 NTU 95% of the time and <1.0 NTU 100% of the time.

[C]Filtered turbidity values are not reported due to the fact that the Bomont Water Supply Plant was not treating raw water. Instead, treated water turbidity is reported and calculated from clearwell monitoring and must be less than 5.0 NTU as required by Provincial Permit.

TYPICAL ANALYSIS – SMALL SYSTEMS
2022/23
(in milligrams per litre unless shown otherwise)
Note: All regulatory compliance analysis are processed by third-party laboratories.

PARAMETERS	FIVE ISLAND LAKE		SILVER SANDS		GUIDELINES FOR CANADIAN DRINKING WATER QUALITY	
	Raw Water	Treated Water	Raw Water	Treated Water	Maximum Acceptable Concentration	Aesthetic Objective Concentration
Alkalinity (as CaCO3)	32.0	32.5	57.7	60.0	-	-
Aluminum	0.008	<0.005	<0.005	<0.005	2.9	0.2
Ammonia (N)	<0.05	<0.05	0.053	<0.05	-	-
Arsenic	0.004	0.004	0.002	<0.001	0.010	-
Calcium	8.9	9.1	34.3	37	-	-
Chloride	5.9	7.8	59.5	65.7	-	≤250
Chlorate	<0.1	0.18	<0.5	0.4	1.0	-
Chlorite	<0.1	<0.1	<0.5	<0.1	1.0	-
Colour (True Colour Units)	<5.0	<0.5	<5.0	<5.0	-	≤15.0
Conductivity (µS/cm)	84	90	360	366	-	-
Copper (Total)	0.0016	0.0100	<0.0005	0.0152	2.0	≤1.0
Fluoride	0.4	0.4	0.3	0.5	1.5	-
Hardness (as CaCO3)	26.5	27.0	103.3	110.0	-	-
HAA5 (avg.)	-	<0.005	-	<0.005	0.080	-
Iron (Total)	0.08	<0.05	1.06	0.05	-	≤0.3
Lead (Total) (µg/l)	<0.5	<0.5	<0.5	<0.5	5.0	-
Magnesium	1.1	1.1	5.0	5.3	-	-
Manganese (Total)	<0.002	<0.002	1.10	0.017	0.12	≤0.02
Mercury (µg/l)	<0.013	<0.013	<0.013	<0.013	1.0	-
Nitrate (as N)	<0.05	<0.05	<0.05	<0.05	10.0	-
Nitrite (as N)	<0.01	<0.01	<0.01	<0.01	1.0	-
pH (pH Units)	7.4	7.7	7.8	7.2	-	7.0 - 10.5
Potassium	0.5	0.5	0.9	0.9	-	-
Sodium	6.0	7.6	24.3	29.0	-	≤200
Solids (Total Dissolved)	59	60	203	215	-	≤500
Sulphate	3.2	3.4	18.3	17.0	-	≤500
Turbidity (NTU)	1.12	0.15	18.67	0.15	[A]1.0	-
Total Organic Carbon (TOC)	<0.5	<0.5	<0.5	<0.5	-	-
THMs (avg.)	-	<0.001	-	<0.001	0.100	-
Uranium (µg/l)	10.6	11.0	<0.1	<0.1	20.0	-
Zinc (Total)	<0.005	<0.005	<0.005	<0.005	-	≤5.0
PCB (µg/l)	<0.05	<0.05	-	-	-	-
Gross Alpha / Gross Beta (Bq/L)	0.32/0.51	0.24/0.25	<0.1	<0.1	0.5 / 1.0	-

[A]The Five Island Lake and Silver Sands Water Supply Plants must produce water with turbidity of <1.0 NTU 95% of the time, as required by Provincial Permit. Treated water turbidity is calculated from clearwell monitoring.

TYPICAL ANALYSIS - SMALL SYSTEMS
2022/23
(in milligrams per litre unless shown otherwise)
Note: All regulatory compliance analysis are processed by third-party laboratories.

PARAMETERS	COLLINS PARK		MIDDLE MUSQUODOBOIT		GUIDELINES FOR CANADIAN DRINKING WATER QUALITY	
	Raw Water	Treated Water	Raw Water	Treated Water	Maximum Acceptable Concentration	Aesthetic Objective Concentration
Alkalinity (as CaCO3)	15	4.9	34	104	-	-
Aluminum	0.039	<0.005	0.012	<0.005	2.9	0.1
Ammonia (N)	0.087	0.14	0.07	0.118	-	-
Arsenic	0.003	<0.001	<0.001	<0.001	0.010	-
Calcium	7.45	0.24	14.7	4.3	-	-
Chloride	41	8.75	10.3	7.26	-	≤250
Chlorate	<0.1	0.17	<0.1	0.16	1.0	-
Chlorite	<0.1	<0.1	<0.1	<0.1	1.0	-
Colour (True Colour Units)	21	<5.0	5.2	<5.0	-	≤15.0
Conductivity (µS/cm)	170	32	123	205	-	-
Copper (Total)	0.0009	<0.0005	0.0007	0.0009	2.0	≤1.0
Fluoride	<0.1	<0.1	<0.1	<0.1	1.5	-
Hardness (as CaCO3)	23	<1.0	47	17	-	-
HAA5 (avg.)	-	<0.005	-	<0.005	0.080	-
Iron (Total)	0.12	<0.05	<0.05	<0.05	-	≤0.3
Lead (Total) (µg/l)	<0.5	<0.5	<0.5	<0.5	5.0	-
Magnesium	1	<0.1	4.85	1.63	-	-
Manganese (Total)	0.065	<0.002	0.003	0.010	0.12	≤0.02
Mercury (µg/l)	<0.013	<0.013	<0.013	<0.013	1.0	-
Nitrate (as N)	0.103	0.062	0.235	0.223	10.0	-
Nitrite (as N)	<0.01	<0.01	<0.01	<0.01	1	-
pH (pH Units)	7.2	7.5	7.0	7.5	-	7.0 - 10.5
Potassium	1	0.21	0.83	0.527	-	-
Sodium	25.5	10.3	5.6	44.25	-	≤200
Solids (Total Dissolved)	95	28	81	120	-	≤500
Sulphate	7.35	1.5	23.93	1.46	-	≤500
Turbidity (NTU)	1.75	0.03	0.82	0.03	[A]0.1/0.3	-
Total Organic Carbon (TOC)	4.3	<0.5	1.017	<0.5	-	-
THMs (avg.)	-	0.002	-	0.002	0.100	-
Uranium (µg/l)	<0.1	<0.1	<0.1	<0.1	20.0	-
Zinc (Total)	<0.005	0.068	<0.005	0.058	-	≤5.0
PCB (µg/l)	-	-	-	-	-	-
Gross Alpha / Gross Beta (Bq/L)	<0.1	<0.1	<0.1	<0.1	0.5 / 1.0	-

[A]Ultra-filtration membrane plants must produce water with turbidity of <0.1 NTU 99% of the time and <0.3 NTU 100% of the time, as required by Provincial Permit. Treated water turbidity is calculated from clearwell monitoring.


Halifax
Water


Halifax
Water

ITEM #4-I
Halifax Water Board
June 22, 2023

TO: Colleen Rollings, P.Eng., PMP, Chair, and Members of the Halifax Regional Water Commission Board as Trustees of the Halifax Regional Water Commission Employees' Pension Plan

SUBMITTED BY: Alicia Scallion (Jun 15, 2023 16:34 ADT)
Alicia Scallion, CPA, CA, Director, Corporate Services / CFO

APPROVED: Louis de Montbrun (Jun 16, 2023 09:02 ADT)
Louis de Montbrun, CPA, CA, General Manager

DATE: June 14, 2023

SUBJECT: **Halifax Regional Municipality Master Trust Investment Performance, First Quarter, 2023**

INFORMATION REPORT

ORIGIN

The Halifax Regional Municipality Master Trust (the "Master Trust") investment performance is reported to the Halifax Regional Water Commission Board as Trustees of the Halifax Regional Water Commission Employees' Pension Plan periodically throughout the year.

BACKGROUND

None.

DISCUSSION

The table below and the attached Investment Report provide a performance update for the First Quarter of 2023 (January to March) for the Master Trust, of which Halifax Regional Water Commission Employees' Pension Plan (the "Plan") is a part. The fair value of the investment in the Master Trust is determined and updated at year-end, and the Plan's share in the Master Trust at December 31, 2022 was 6.56%, totaling $173.0 million.

The Master Trust earned 4.1% in the First Quarter, which underperformed the First Quarter policy benchmark of 4.6% by -0.5%. The return for the 1-year period ended March 31, 2023, is 6.8%,

outperforming the 1-year policy benchmark of 3.1% by 3.7%. Other historical returns are provided in Table 1 below.

Table 1 – Returns

	Current Quarter (Jan to Mar)	1-Year	3 - Year Annualized	4 - Year Annualized	Inception To Date
Fund Return	4.12%	6.78%	9.55%	7.43%	7.17%
Policy Benchmark	4.59%	3.15%	6.77%	5.03%	5.54%
Excess Return	-0.47%	3.63%	2.78%	2.40%	1.63%

The total fund returns are subject to investment management fees and plan expenses.

As at March 31, 2023, the Master Trust was in compliance with the Statement of Investment Policies and Procedures (SIP&P).

ATTACHMENT

Attachment 1 - HRM Master Trust Plan Performance Q1 2023
Attachment 2 - HRM Master Trust Investment Risk & Analytical Services Q1 2023

Report Prepared by: H Britten
H Britten (Jun 15, 2023 14:57 ADT)
Heather Britten, Quality Assurance Officer (782) 641- 1431

Plan Performance

Plan Performance Summary

	Q1	1 year	4 year
Total Plan	4.1%	6.8%	7.4%
Benchmark	4.6%	3.1%	5.0%
Value Add	-0.5%	3.7%	2.4%

	Q1	1 year	4 year
Equities	4.7%	0.2%	6.6%
Benchmark	6.4%	0.2%	7.6%
Value Add	-1.7%	0.0%	-1.0%

	Q1	1 year	4 year
Fixed Income	2.5%	0.8%	2.4%
Benchmark	2.7%	-0.3%	0.4%
Value Add	-0.2%	1.1%	2.0%

Plan Performance Summary

	Q1	1 year	4 year
Real Assets	4.8%		
Benchmark	2.7%		
Value Add	2.1%		

	Q1	1 year	4 year
Public Market Alternatives	3.1%	6.3%	
Benchmark	2.0%	7.2%	
Value Add	1.1%	-0.9%	

NORTHERN TRUST

HRM Master Trust

Investment Risk & Analytical Services

March 31, 2023

Table of Contents

SECTION 1

HRM Master Trust

Investment Risk & Analytical Services

March 31, 2023

FIRST QUARTER 2023

Provided by Northern Trust Asset Management

OK, ON AVERAGE

On average, the global economy looks to be "OK" – regional and sectoral areas of weakness being offset by other areas of relative strength; meanwhile, inflation seems contained in some areas albeit still raging in others. *On average*, the financial system is "OK" – concerns in some regional banks and other "one-off" issues (driven mostly by poor risk management) absorbable by the broader, still-healthy banking industry. And, *on average*, the global financial market outlook looks "OK" – global equity valuations are near the median valuation level of the past 25 years (~19 times last-twelve-months earnings). But you are also "OK, on average" if you are six feet tall standing in a lake that averages five feet deep. That is, on average, you have no fear of drowning despite the fact that there are almost assuredly areas in that lake where you would be underwater. The key to successful investing is to appreciate potential financial and economic "deep spots" potentially masking what looks "OK" on the surface.

Growth and Inflation. *On average*, the global economy has displayed much resiliency in the face of geopolitical disruptions and higher interest rates. Global composite purchasing managers' indices (PMIs) sit at ~52 – modestly higher than the ~48 mark coming into 2023 and above the 50 mark that separates expansion from contraction. But underneath that modest expansion, we find a notable gap between the fairly hot service industry and the mostly tepid manufacturing industry; most notably the case in the United States, where the manufacturing PMI sits near 46 while the services PMI sits closer to 55. Growth disparities have led to inflation disparities, with core goods inflation already back below the Federal Reserve's 2% target but with core services inflation still stuck in the 6-7% range.

Central Banks and Credit Markets. Stubborn services inflation kept the Fed focused on rate hikes – until the failure of Silicon Valley Bank and resulting contagion forced one eye over to monitoring financial industry health. As such, *on average*, markets expect one more 0.25% rate hike before a Fed cutting cycle starts near year end. But that "average" is a combination of a higher rate trajectory should services inflation linger and a lower rate trajectory should bank stresses persist.

Financial Markets. When ostensibly benign average expected outcomes are masking a wide range of potential outcomes underneath, financial markets often respond with outsized volatility. One day, an inflation print below expectations can lead to "risk-on" markets as investors price in the end of the rate hike cycle; the next day, a headline suggesting another bank may be in trouble can mean "risk-off" markets as investors brace for impact. In these environments, it is especially important to keep adequate liquidity for spending needs so as to not be forced into selling "good assets on a bad day" while also maintaining proper diversification – not only among stocks and bonds but also real assets and other diversifiers.

MARKET EVENTS

JANUARY	FEBRUARY	MARCH
6 December U.S. jobs report shows continued strength but gradual cooling with slower job gains, increased participation and slower wage growth.	3 A much stronger than expected U.S. jobs report triggers upward revisions in investor policy expectations (later intensified by the 2/14 CPI data).	10 The second-biggest U.S. bank failure (Silicon Valley Bank, aka SVB) triggers a run on regional bank deposits and elevates financial stability risks.
12 Investors price in less central bank tightening after U.S. Consumer Price Index (CPI) cools year-over-year (y/y).	4 Geopolitical frictions deepen after the U.S. shoots down a China surveillance balloon in U.S. airspace, though the market impact is contained.	15 Bank turmoil continues after Credit Suisse (CS) shares plunge on perceived weakness and its ensuing deposit outflows force a rescue sale to UBS.
13 Q422 earnings season unofficially begins; earnings proceed to contract with broad-based weakness (ex-energy) and disappointing forward guidance.	24 One-year anniversary of the Ukraine war; little progress has been made toward a peaceful resolve and escalation risks remain present.	16 The European Central Bank moves ahead with a 50-bp rate hike, but aims to verbally assuage financial stability worries and removes forward guidance.
19 U.S. government reaches its $31.4 trillion borrowing limit and invokes extraordinary funding measures estimated to last until ~June–September.	24 Core Personal Consumption Expenditures – the Fed's preferred inflation measure – unexpectedly accelerates to 4.7% from 4.3%.	22 Amid bank turmoil but elevated inflation the Fed hikes its policy rate by 25 bps, softens language on future hikes and leaves its 2023 year-end Fed funds rate forecast unchanged at 5.1%.
24 U.S. and Europe flash Purchasing Managers' Indexes (PMIs) come in better than expected while 4Q U.S. Gross Domestic Product is solid at 2.9%.	28 China PMIs top expectations and the expansionary threshold (50) as its reopening supports domestic growth.	27 First Citizens Bank purchases SVB at a $16.5B discount, helping ease investor concern after a period of no new developments on further bank contagion.

FIRST QUARTER 2023 TOTAL RETURNS (%)

Strong returns across most financial market assets mask a quarter full of volatile swings – especially within bond markets.

	Cash	Muni	Inv. Grade	TIPS	High Yield	EM Debt	U.S.	Dev. Ex-U.S.	EM	NR	GRE	GLI
2022	1.5	-8.5	-13.0	-11.8	-11.2	-11.7	-19.2	-14.8	-19.5	10.3	-24.1	-0.2

Source: Northern Trust Asset Management, Bloomberg. NR: Natural Resources; GRE: Global Real Estate; GLI: Global Listed Infrastructure. Indexes are gross of fees. Past performance is not indicative or a guarantee of future results. Index performance returns do not reflect any management fees, transaction costs or expenses. It is not possible to invest directly in any index.

MARKET REVIEW

Initial Inflation Optimism

Equities firmly rebounded in January with key support from increased investor optimism on the path of inflation and less communication from central bankers on further rate hikes. This led to a strong month of returns in the U.S. and also outside the U.S. with mild weather alleviating energy concerns in Europe and China's rebound from Covid-19 reopening. Equity performance in January was in many ways a reversal of 2022, where many 2022 laggards notably outperformed (see chart) and riskier parts of the market performed well.

Not So Fast...

In February, economic data releases proved firmer than expected – more resilient on the growth front and stickier on the inflation side. A key tenet of the solid economic backdrop was strong labor markets where the unemployment rate fell to its lowest level since the late 1960s. In response, the equity market rally lost steam as investors reconsidered their inflation views and upwardly revised their expected trajectory for central banks. However, March's banking issues (see next section) unwound the increase in Fed expectations.

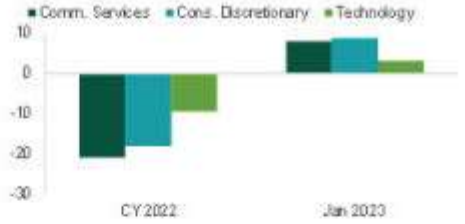
March Madness for Banks

In March, investor worries of more Fed rate hikes shifted to financial stability concerns. Initially, Silicon Valley Bank (SVB) suffered major deposit outflows before regulators took control of it (along with Signature Bank). U.S. policymakers quickly stepped in with emergency liquidity measures to help stabilize the banking sector. Credit Suisse (CS) was then under pressure the next week before being acquired by UBS with support from Swiss authorities. Overall, U.S. banks declined 25% in March (versus a 3.5% S&P 500 gain).

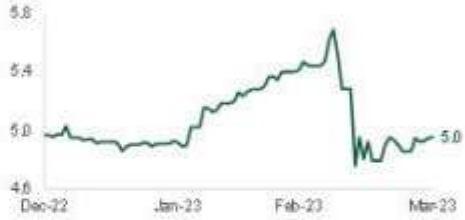
Choppy Rates, Calmer Equities

The banking-related market reaction was more notable in interest rates versus equities. The S&P 500 initially lost only 3%, while interest rates saw historically high volatility. The 2-year Treasury yield dropped over 100 bps as investor Fed expectations reset lower (i.e., lower peak rate, more likely 2023 rate cuts). While systemic risks stabilized to some degree by late March, a number of implications are possible both near-term (tightening in credit conditions) and longer-term (bank regulation, profitability challenges for small-to-midsized banks).

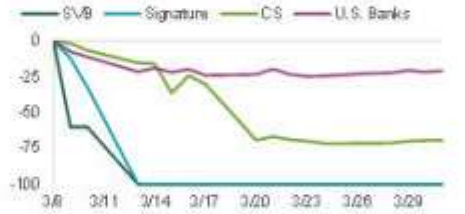
RELATIVE RETURNS OF VARIOUS SECTORS (%)



EXPECTED 2023 PEAK FED FUNDS RATE (%)



% RETURN SINCE ONSET OF SVB ISSUES (3/8/23)

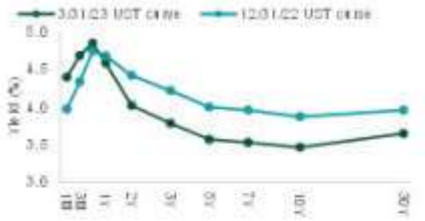


VOLATILITY RELATIVE TO 2022 AVERAGE LEVEL

Interest Rates

The Fed continued to tighten policy but is moving forward with more caution due to the potential for bank stresses to weigh on credit availability. That said, inflation remains a concern and the Fed's year-end policy rate forecast (5.1%) implies a hold-firm approach. Interest rates seesawed in a volatile manner during the quarter as investors struggled to ascertain the monetary policy outlook in the wake of hot inflation amid risks to financial stability. Interest rates across the curve ended lower with near-term yields declining the most.

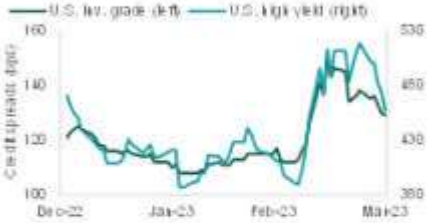
U.S. TREASURY YIELD CURVE



Credit Markets

Credit spreads floated up and down for most of the quarter before moving decidedly higher on banking sector strains. The bank shocks ramped up investor uncertainty on the health of corporate credit and drove wider risk premia across investment grade (IG) and high yield (HY). IG and HY credit spreads rose as much as 38 and 128 basis points (bps), respectively, before coming back in as perceived risks abated. IG spreads ended 8 bps wider, while HY finished 13 bps tighter. Current spreads for both are under recessionary levels.

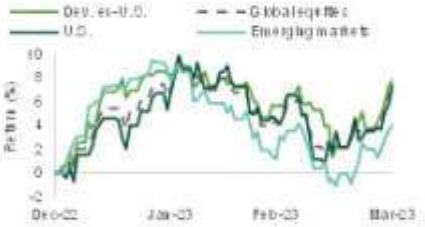
CREDIT SPREADS



Equities

Global equities brought solid gains (7.4%) as developed ex-U.S. equities (7.7%) and U.S. equities (7.3%) led the way while emerging market equities delivered a lower-but-strong return (4.0%). These gains may appear at odds given two of the largest U.S. bank failures ever, however, declining interest rates led to a reprieve in some of the most sizable areas of the markets (i.e., U.S. tech up 21.8%) which buoyed aggregate returns. Equity volatility paled in comparison to bond volatility, but there were still notable swings beneath the surface.

REGIONAL EQUITY INDICES



Real Assets

Real assets bore the brunt of weakness extending from both central bank tightening and banking strains as listed infrastructure (3.9%), global real estate (0.7%) and natural resources (0.6%) all lagged global equities. Listed infrastructure's interest rate sensitivity benefited from the decline in yields. Lower commodity prices hurt equity-based natural resources as demand concerns intensified on signs of global economic vulnerability. Real estate suffered from investor concerns on bank lending – mostly regarding commercial real estate.

REAL ASSET INDICES

Market Overview

IMPORTANT INFORMATION

Indexes used: Bloomberg Barclays (BBC) 1-3 Month UST (Cash); BBC Municipal (Muni); BBC Aggregate (Inv. Grade); BBC TIPS (TIPS); BBC High Yield 2% Capped (High Yield); JP Morgan GBI-EM Global Diversified (Em. Markets Fixed Income); MSCI U.S. Equities IMI (U.S. Equities); MSCI World ex-U.S. IMI (Dev. ex-U.S. Equities); MSCI Emerging Market Equities IMI (Em. Markets Equities); S&P Global Natural Resources (Natural Resources); MSCI ACWI IMI Core Real Estate (Global Real Estate); S&P Global Infrastructure (Global Listed Infrastructure).

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KEY DEVELOPMENTS

Investment Hierarchy

Account/Group	Ending Market Value CAD	Ending Weight	% Rate of Return								
			One Month	Three Months	Year to Date	One Year	Three Years	Four Years	Ten Years	Inception to Date	Inception Date
HRM Master Trust	**2,737,345,067**	**100.00**	**1.18**	**4.12**	**4.12**	**6.78**	**9.55**	**7.43**	**8.14**	**7.17**	**09/30/1999**
HRM Policy Benchmark			*1.45*	*4.59*	*4.59*	*3.15*	*6.77*	*5.03*	*5.72*	*5.54*	*09/30/1999*
Excess Return			*-0.27*	*-0.47*	*-0.47*	*3.63*	*2.78*	*2.40*	*2.42*	*1.63*	*09/30/1999*
HRM Total Equity	**1,252,009,634**	**45.74**	**0.93**	**4.69**	**4.69**	**0.17**	**12.25**	**6.61**	**-**	**7.18**	**12/31/2015**
HRM Total Equity Benchmark			*1.58*	*6.43*	*6.43*	*0.15*	*13.61*	*7.63*	*-*	*8.12*	*12/31/2015*
Excess Return			*-0.65*	*-1.74*	*-1.74*	*0.02*	*-1.36*	*-1.02*	*-*	*-0.94*	*12/31/2015*
HRM Cdn Equity	**102,348,518**	**3.74**	**-0.39**	**3.37**	**3.37**	**-4.63**	**15.77**	**6.81**	**5.14**	**4.71**	**03/31/2006**
S&P/TSX Composite			*-0.22*	*4.55*	*4.55*	*-5.17*	*18.02*	*8.98*	*7.86*	*6.10*	*03/31/2006*
Excess Return			*-0.17*	*-1.18*	*-1.18*	*0.54*	*-2.26*	*-2.17*	*-2.72*	*-1.39*	*03/31/2006*
Blackrock	**99,808,228**	**3.65**	**-0.39**	**3.82**	**3.82**	**-4.08**	**17.81**	**8.80**	**7.81**	**8.40**	**12/31/2003**
S&P/TSX Composite			*-0.22*	*4.55*	*4.55*	*-5.17*	*18.02*	*8.98*	*7.86*	*7.74*	*12/31/2003*
Excess Return			*-0.17*	*-0.74*	*-0.74*	*1.09*	*-0.21*	*-0.18*	*-0.05*	*0.66*	*12/31/2003*
P2P Holdings	**2,540,290**	**0.09**	**-0.48**	**-11.49**	**-11.49**	**-22.29**	**-7.62**	**-15.61**	**-**	**-29.39**	**02/03/2017**
S&P/TSX Composite			*-0.22*	*4.55*	*4.55*	*-5.17*	*18.02*	*8.98*	*-*	*7.56*	*02/03/2017*
Excess Return			*-0.26*	*-16.04*	*-16.04*	*-17.12*	*-25.65*	*-24.59*	*-*	*-36.94*	*02/03/2017*
HRM Global Equity	**763,720,728**	**27.90**	**1.18**	**6.51**	**6.51**	**-**	**-**	**-**	**-**	**6.51**	**12/31/2022**
HRM Custom Global Equity Index			*1.68*	*7.29*	*7.29*	*-*	*-*	*-*	*-*	*7.29*	*12/31/2022*
Excess Return			*-0.50*	*-0.78*	*-0.78*	*-*	*-*	*-*	*-*	*-0.78*	*12/31/2022*
AB EDHEC	**135,089,637**	**4.94**	**1.28**	**5.58**	**5.58**	**2.82**	**13.11**	**7.33**	**-**	**7.74**	**12/31/2015**
MSCI World ND			*2.48*	*7.60*	*7.60*	*0.74*	*14.46*	*9.39*	*-*	*8.94*	*12/31/2015*
Excess Return			*-1.20*	*-2.02*	*-2.02*	*2.08*	*-1.35*	*-2.06*	*-*	*-1.20*	*12/31/2015*
Blackrock Global Alpha Advanta	**120,465,242**	**4.40**	**3.66**	**9.17**	**9.17**	**5.80**	**-**	**-**	**-**	**5.75**	**05/25/2021**
MSCI ACWI ND			*2.47*	*7.18*	*7.18*	*0.29*	*-*	*-*	*-*	*3.03*	*05/25/2021*
Excess Return			*1.19*	*1.99*	*1.99*	*5.51*	*-*	*-*	*-*	*2.72*	*05/25/2021*
Blackrock MSCI Small Cap	**47,598,393**	**1.74**	**-3.28**	**4.25**	**4.25**	**-1.21**	**-**	**-**	**-**	**-0.74**	**05/19/2021**
MS Wld Small Cap Net Index			*-3.15*	*4.17*	*4.17*	*-1.81*	*-*	*-*	*-*	*-1.06*	*05/19/2021*
Excess Return			*-0.13*	*0.08*	*0.08*	*0.61*	*-*	*-*	*-*	*0.32*	*05/19/2021*
Blackrock MSCI World Passive	**128,966,733**	**4.71**	**2.52**	**7.70**	**7.70**	**1.15**	**-**	**-**	**-**	**6.46**	**05/12/2021**
MSCI World ND			*2.48*	*7.60*	*7.60*	*0.74*	*-*	*-*	*-*	*6.07*	*05/12/2021*
Excess Return			*0.04*	*0.10*	*0.10*	*0.40*	*-*	*-*	*-*	*0.39*	*05/12/2021*
Global Alpha	**50,340,354**	**1.84**	**-2.89**	**5.17**	**5.17**	**-0.00**	**-**	**-**	**-**	**-0.24**	**03/09/2022**
MS Wld Small Cap Net Index			*-3.15*	*4.17*	*4.17*	*-1.81*	*-*	*-*	*-*	*-0.03*	*03/09/2022*
Excess Return			*0.26*	*1.00*	*1.00*	*1.81*	*-*	*-*	*-*	*-0.21*	*03/09/2022*

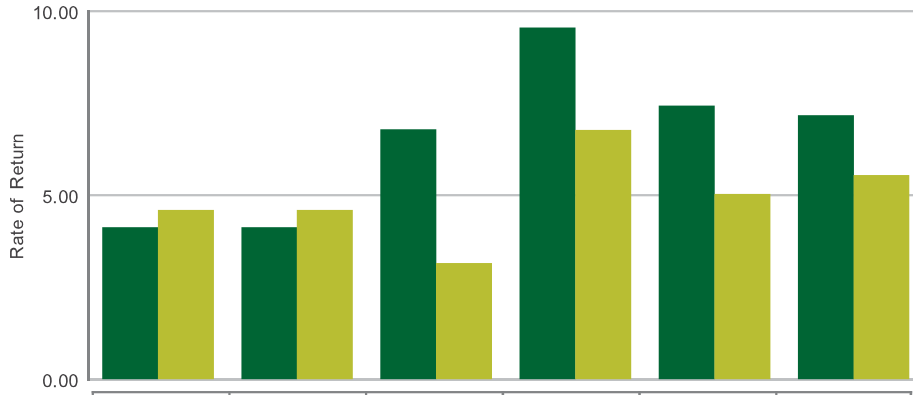
Account/Group	Ending Market Value CAD	Ending Weight	% Rate of Return One Month	Three Months	Year to Date	One Year	Three Years	Four Years	Ten Years	Inception to Date	Inception Date
Marathon International Equity	**67,155,856**	**2.45**	**0.38**	**7.34**	**7.34**	**7.33**	**-**	**-**	**-**	**1.11**	**05/28/2021**
MSCI EAFE ND			*1.87*	*8.34*	*8.34*	*6.86*	*-*	*-*	*-*	*2.55*	*05/28/2021*
Excess Return			*-1.49*	*-1.00*	*-1.00*	*0.48*	*-*	*-*	*-*	*-1.44*	*05/28/2021*
Mawer International Equity	**78,475,852**	**2.87**	**2.07**	**7.63**	**7.63**	**4.13**	**-**	**-**	**-**	**-0.01**	**02/28/2021**
MSCI ACWI ex USA ND			*1.84*	*6.74*	*6.74*	*2.86*	*-*	*-*	*-*	*0.59*	*02/28/2021*
Excess Return			*0.23*	*0.89*	*0.89*	*1.27*	*-*	*-*	*-*	*-0.61*	*02/28/2021*
Wellington US Equity	**135,628,661**	**4.95**	**0.79**	**4.96**	**4.96**	**-1.56**	**21.54**	**13.37**	**13.45**	**13.17**	**04/30/2011**
HRM US Equity			*3.05*	*7.37*	*7.37*	*-0.02*	*20.50*	*12.42*	*12.31*	*11.93*	*04/30/2011*
Excess Return			*-2.26*	*-2.41*	*-2.41*	*-1.54*	*1.04*	*0.95*	*1.15*	*1.24*	*04/30/2011*
HRM Emerging Markets	**95,485,614**	**3.49**	**1.91**	**4.18**	**4.18**	**2.75**	**5.39**	**0.03**	**4.58**	**4.81**	**09/30/2010**
MSCI Emerging Markets ND			*2.42*	*3.83*	*3.83*	*-3.25*	*6.03*	*1.12*	*4.96*	*4.02*	*09/30/2010*
Excess Return			*-0.50*	*0.35*	*0.35*	*6.00*	*-0.64*	*-1.09*	*-0.38*	*0.78*	*09/30/2010*
CC&L Emerging Markets	**40,593,505**	**1.48**	**-1.00**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**12/31/2022**
MSCI Emerging Markets ND			*2.42*	*-*	*-*	*-*	*-*	*-*	*-*	*3.83*	*12/31/2022*
Excess Return			*-3.41*	*-*	*-*	*-*	*-*	*-*	*-*	*-*	*12/31/2022*
Trinetra Emerg Mrkts Grwth Fnd	**54,890,685**	**2.01**	**4.18**	**5.30**	**5.30**	**3.11**	**5.65**	**1.36**	**-**	**2.71**	**08/31/2017**
MSCI Emerging Markets ND			*2.42*	*3.83*	*3.83*	*-3.25*	*6.03*	*1.12*	*-*	*2.04*	*08/31/2017*
Excess Return			*1.76*	*1.46*	*1.46*	*6.36*	*-0.38*	*0.24*	*-*	*0.67*	*08/31/2017*
Wellington EMLE	**1,424**	**0.00**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**07/31/2011**
MSCI Emerging Markets ND			*-*	*-*	*-*	*-*	*-*	*-*	*-*	*-*	*07/31/2011*
Excess Return			*-*	*-*	*-*	*-*	*-*	*-*	*-*	*-*	*07/31/2011*
HRM Private Equity	**290,454,775**	**10.61**	**0.40**	**0.67**	**0.67**	**15.14**	**19.26**	**17.97**	**19.53**	**20.95**	**09/30/2011**
HRM PE Benchmark			*2.64*	*8.12*	*8.12*	*13.33*	*8.66*	*8.02*	*7.05*	*7.00*	*09/30/2011*
Excess Return			*-2.24*	*-7.46*	*-7.46*	*1.80*	*10.61*	*9.95*	*12.49*	*13.95*	*09/30/2011*
Private Equity	**290,454,775**	**10.61**	**0.40**	**0.67**	**0.67**	**15.14**	**19.26**	**17.97**	**19.53**	**20.95**	**09/30/2011**
HRM Total Fixed Income	**625,836,443**	**22.86**	**0.94**	**2.46**	**2.46**	**0.80**	**2.69**	**2.37**	**-**	**2.82**	**12/31/2015**
HRM FI Benchmark			*1.78*	*2.68*	*2.68*	*-0.28*	*-0.45*	*0.43*	*-*	*1.22*	*12/31/2015*
Excess Return			*-0.84*	*-0.22*	*-0.22*	*1.08*	*3.14*	*1.94*	*-*	*1.61*	*12/31/2015*
Cash and Cash Equivalents	**88,329,631**	**3.23**	**0.37**	**1.09**	**1.09**	**4.09**	**2.18**	**1.40**	**2.23**	**4.34**	**03/31/2009**
3M CAD Bankers Acceptance Rate			*0.42*	*1.26*	*1.26*	*4.04*	*1.70*	*1.76*	*1.47*	*1.35*	*03/31/2009*
Excess Return			*-0.05*	*-0.17*	*-0.17*	*0.06*	*0.48*	*-0.35*	*0.76*	*2.98*	*03/31/2009*
Lincluden CDOR	**88,329,631**	**3.23**	**0.37**	**1.09**	**1.09**	**4.07**	**0.38**	**1.44**	**-**	**1.55**	**12/31/2013**
3M CAD Bankers Acceptance Rate			*0.42*	*1.26*	*1.26*	*4.04*	*1.70*	*1.76*	*-*	*1.49*	*12/31/2013*
Excess Return			*-0.05*	*-0.17*	*-0.17*	*0.04*	*-1.32*	*-0.32*	*-*	*0.06*	*12/31/2013*
Global Credit	**74,803,766**	**2.73**	**0.42**	**1.46**	**1.46**	**-0.70**	**-**	**-**	**-**	**-0.70**	**03/31/2022**

Account/Group	Ending Market Value CAD	Ending Weight	% Rate of Return One Month	Three Months	Year to Date	One Year	Three Years	Four Years	Ten Years	Inception to Date	Inception Date
AB Global Credit	**74,803,766**	**2.73**	**0.42**	**1.46**	**1.46**	**-0.70**	**2.74**	**0.82**	**2.62**	**4.78**	**03/31/2009**
AB FI Blend			*1.07*	*1.71*	*1.71*	*-1.03*	*0.02*	*0.50*	*0.97*	*0.99*	*03/31/2009*
Excess Return			*-0.65*	*-0.25*	*-0.25*	*0.33*	*2.71*	*0.32*	*1.65*	*3.79*	*03/31/2009*
North American Credit	**185,876,544**	**6.79**	**0.44**	**2.49**	**2.49**	**1.63**	**8.84**	**6.84**	**-**	**5.83**	**12/31/2015**
HRM Custom Corporate Benchmark			*1.20*	*2.31*	*2.31*	*-1.43*	*0.48*	*0.68*	*-*	*2.05*	*12/31/2015*
Excess Return			*-0.75*	*0.19*	*0.19*	*3.06*	*8.36*	*6.16*	*-*	*3.78*	*12/31/2015*
Canso	**84,694,267**	**3.09**	**0.65**	**3.68**	**3.68**	**0.79**	**13.04**	**8.88**	**7.16**	**8.00**	**02/28/2010**
FTSE TMX Corporate Bond IDX			*1.33*	*2.79*	*2.79*	*-0.97*	*0.63*	*0.80*	*2.48*	*3.46*	*02/28/2010*
Excess Return			*-0.68*	*0.89*	*0.89*	*1.77*	*12.41*	*8.08*	*4.68*	*4.53*	*02/28/2010*
HRM Corporate Debt	**101,182,277**	**3.70**	**0.27**	**1.53**	**1.53**	**2.70**	**3.18**	**3.60**	**-**	**6.11**	**01/31/2014**
FTSE TMX Short Corp BD IDX			*0.87*	*1.95*	*1.95*	*0.87*	*1.23*	*1.33*	*-*	*1.96*	*01/31/2014*
Excess Return			*-0.60*	*-0.42*	*-0.42*	*1.83*	*1.95*	*2.27*	*-*	*4.16*	*01/31/2014*
Government Bonds	**181,814,236**	**6.64**	**3.05**	**3.72**	**3.72**	**-0.97**	**-1.73**	**0.31**	**-**	**1.36**	**12/31/2015**
FTSE TMX Government Univers			*2.45*	*3.37*	*3.37*	*-2.40*	*-2.50*	*-0.53*	*-*	*0.87*	*12/31/2015*
Excess Return			*0.59*	*0.35*	*0.35*	*1.43*	*0.78*	*0.84*	*-*	*0.49*	*12/31/2015*
Lincluden Gov't	**113,932,281**	**4.16**	**2.51**	**3.45**	**3.45**	**-1.62**	**-1.65**	**0.02**	**-**	**2.25**	**08/31/2013**
FTSE TMX Government Univers			*2.45*	*3.37*	*3.37*	*-2.40*	*-2.50*	*-0.53*	*-*	*2.07*	*08/31/2013*
Excess Return			*0.05*	*0.08*	*0.08*	*0.78*	*0.85*	*0.55*	*-*	*0.18*	*08/31/2013*
Wellington Bond Overlay	**67,881,955**	**2.48**	**3.97**	**3.85**	**3.85**	**-0.19**	**-2.17**	**0.64**	**2.27**	**2.35**	**08/31/2012**
FTSE TMX Government Univers			*2.45*	*3.37*	*3.37*	*-2.40*	*-2.50*	*-0.53*	*1.66*	*1.68*	*08/31/2012*
Excess Return			*1.51*	*0.48*	*0.48*	*2.21*	*0.33*	*1.17*	*0.60*	*0.67*	*08/31/2012*
Private Debt	**95,012,266**	**3.47**	**-1.20**	**1.84**	**1.84**	**10.43**	**8.23**	**9.47**	**3.29**	**0.63**	**12/31/2011**
HRM PD Benchmark			*1.15*	*3.88*	*3.88*	*8.89*	*7.22*	*6.95*	*6.62*	*6.62*	*12/31/2011*
Excess Return			*-2.34*	*-2.05*	*-2.05*	*1.54*	*1.02*	*2.52*	*-3.33*	*-5.99*	*12/31/2011*
Private Debt	**95,012,266**	**3.47**	**-1.20**	**1.84**	**1.84**	**10.43**	**8.23**	**9.47**	**3.29**	**0.63**	**12/31/2011**
HRM Real Assets	**713,178,590**	**26.05**	**1.63**	**4.84**	**4.84**	**-**	**-**	**-**	**-**	**4.84**	**12/31/2022**
HRM Real Assets BM			*0.93*	*2.68*	*2.68*	*-*	*-*	*-*	*-*	*2.68*	*12/31/2022*
Excess Return			*0.70*	*2.17*	*2.17*	*-*	*-*	*-*	*-*	*2.17*	*12/31/2022*
Infrastructure	**298,236,528**	**10.90**	**2.60**	**9.50**	**9.50**	**23.88**	**11.97**	**11.63**	**12.63**	**19.01**	**06/30/2011**
HRM Infrastructure Index			*0.93*	*2.68*	*2.68*	*9.49*	*9.57*	*8.65*	*7.48*	*7.34*	*06/30/2011*
Excess Return			*1.68*	*6.82*	*6.82*	*14.39*	*2.40*	*2.98*	*5.15*	*11.67*	*06/30/2011*
Infrastructure	**298,236,528**	**10.90**	**2.60**	**9.50**	**9.50**	**23.88**	**11.97**	**11.63**	**12.63**	**19.01**	**06/30/2011**
Real Estate	**414,942,062**	**15.16**	**0.85**	**1.23**	**1.23**	**15.53**	**11.81**	**13.30**	**13.19**	**12.10**	**09/30/2011**
HRM Real Estate Index			*0.93*	*2.68*	*2.68*	*9.49*	*9.57*	*8.65*	*7.48*	*7.32*	*09/30/2011*
Excess Return			*-0.08*	*-1.44*	*-1.44*	*6.04*	*2.25*	*4.65*	*5.71*	*4.77*	*09/30/2011*
Real Estate	**414,942,062**	**15.16**	**0.85**	**1.23**	**1.23**	**15.53**	**11.81**	**13.30**	**13.19**	**12.10**	**09/30/2011**

Account/Group	Ending Market Value CAD	Ending Weight	% Rate of Return One Month	Three Months	Year to Date	One Year	Three Years	Four Years	Ten Years	Inception to Date	Inception Date
Public Market Alternatives	**129,256,275**	**4.72**	**2.36**	**3.11**	**3.11**	**6.29**	**-**	**-**	**-**	**5.60**	**02/28/2022**
3M CAD Bankers Acceptance R+3%			*0.67*	*2.01*	*2.01*	*7.15*	*-*	*-*	*-*	*6.92*	*02/28/2022*
Excess Return			*1.70*	*1.10*	*1.10*	*-0.86*	*-*	*-*	*-*	*-1.33*	*02/28/2022*
Public Market Alternatives	**129,256,275**	**4.72**	**2.36**	**3.11**	**3.11**	**6.29**	**-**	**-**	**-**	**5.60**	**02/28/2022**
3M CAD Bankers Acceptance R+3%			*0.67*	*2.01*	*2.01*	*7.15*	*-*	*-*	*-*	*6.92*	*02/28/2022*
Excess Return			*1.70*	*1.10*	*1.10*	*-0.86*	*-*	*-*	*-*	*-1.33*	*02/28/2022*
HRM Operating	**17,064,125**	**0.62**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**12/31/2015**
Operating Account	**17,064,125**	**0.62**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**03/31/2004**

Executive Summary

HRM MASTER TRUST TOTAL FUND NET OF FEES



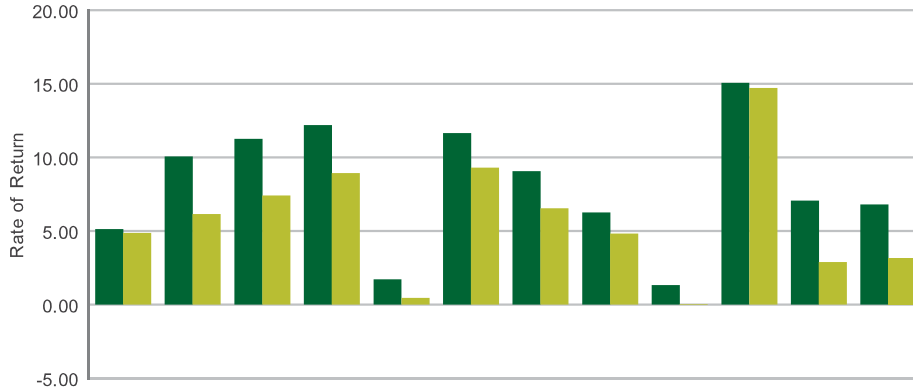
	Three Months	Year to Date	One Year	Three Years	Four Years	ITD
Fund	4.12	4.12	6.78	9.55	7.43	7.17
Index	4.59	4.59	3.15	6.77	5.03	5.54

Index: HRM Policy Benchmark

RISK STATISTICS	3 Mos	1 Yr	4 Yrs
Return	4.12	6.78	7.43
Index Return	4.59	3.15	5.03
Excess Return	-0.47	3.63	2.40
Standard Deviation	-	5.69	5.20
Index Standard Deviation	-	8.06	5.89
Tracking Error	-	3.12	2.23
Information Ratio	-	1.16	1.08
Sharpe Ratio	-	1.04	1.23
Index Sharpe Ratio	-	0.29	0.68
Jensen's Alpha	-	4.26	3.00
Relative Volatility (Beta)	-	0.66	0.82
R Squared	-	0.91	0.86
Beginning MV (in 000s)	2,635,823	2,575,234	2,099,711
Net Contributions (in 000s)	-6,533	-11,309	-50,818
Income (in 000s)	8,658	50,881	220,575
Appreciation (in 000s)	99,398	122,539	467,877
Ending MV (in 000s)	2,737,345	2,737,345	2,737,345

Index: HRM Policy Benchmark. Risk Free Index: JP Morgan 3 month Cash (CAD)
Category: Total Fund Net of Fees. Calculation Frequency: Monthly

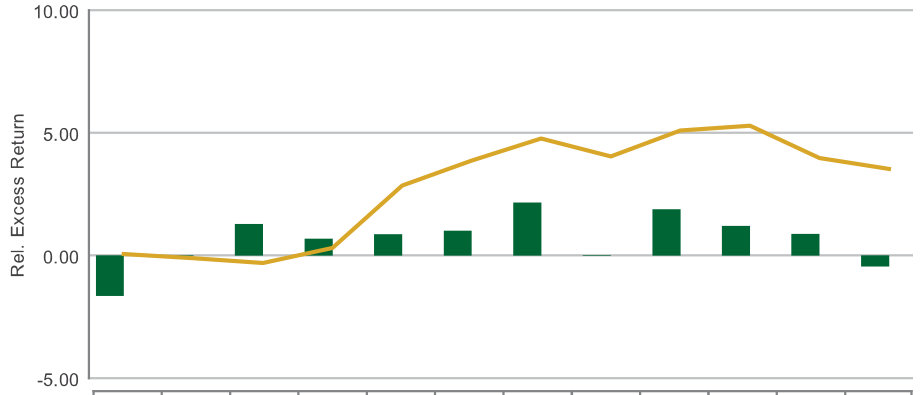
HRM MASTER TRUST ROLLING YEARS TOTAL FUND NET OF FEES



	Mar '12	Mar '13	Mar '14	Mar '15	Mar '16	Mar '17	Mar '18	Mar '19	Mar '20	Mar '21	Mar '22	Mar '23
Fund	5.11	10.05	11.25	12.17	1.70	11.63	9.05	6.24	1.31	15.04	7.04	6.78
Index	4.86	6.14	7.40	8.91	0.44	9.28	6.53	4.80	-0.02	14.70	2.88	3.15

Index: HRM Policy Benchmark

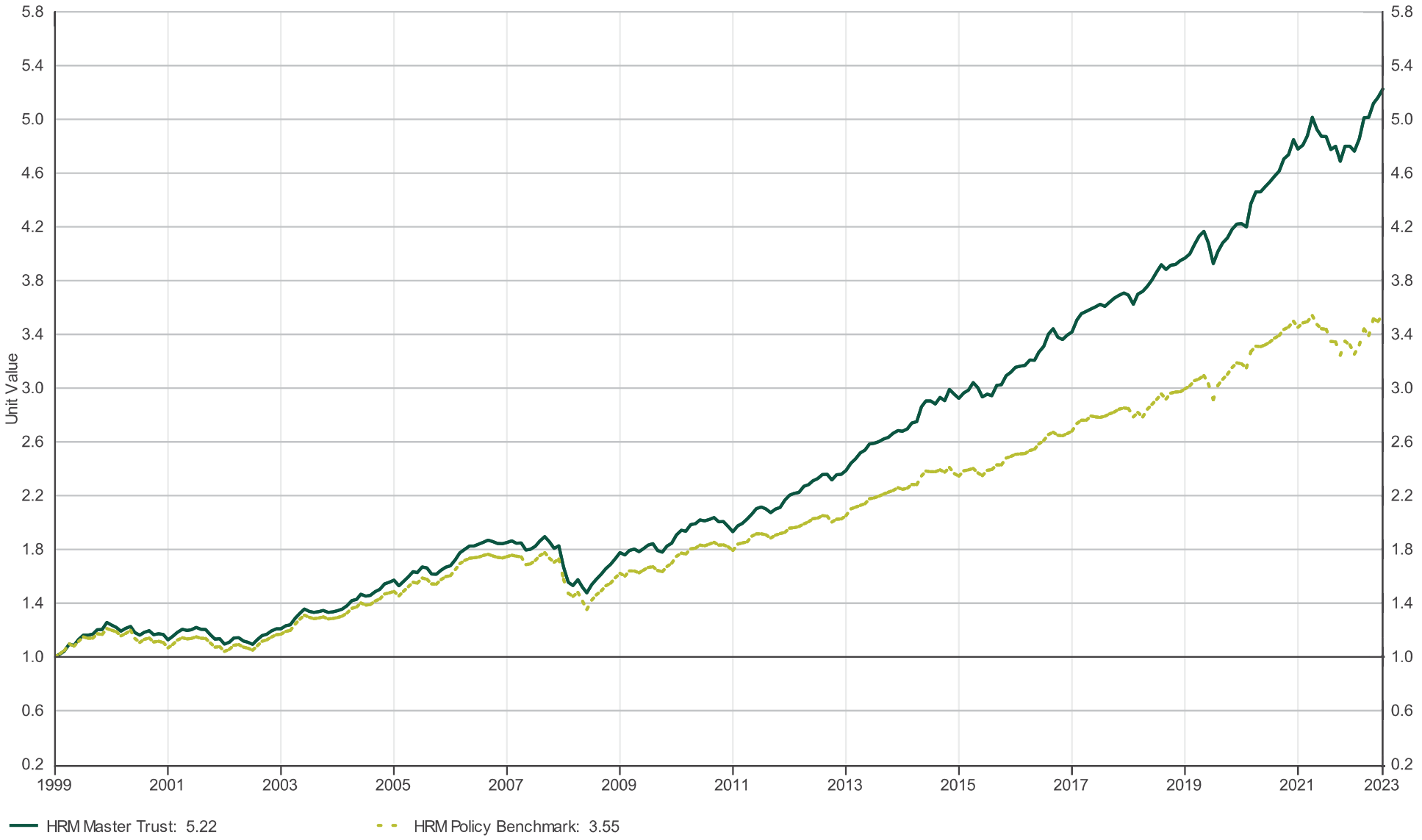
HRM MASTER TRUST ROLLING QUARTERS TOTAL FUND NET OF FEES



	Q2 '20	Q3 '20	Q4 '20	Q1 '21	Q2 '21	Q3 '21	Q4 '21	Q1 '22	Q2 '22	Q3 '22	Q4 '22	Q1 '23
3M R.Excess	-1.64	0.01	1.28	0.68	0.86	1.00	2.15	-0.02	1.88	1.20	0.87	-0.45
1Y R.Excess	0.06	-0.11	-0.31	0.30	2.85	3.87	4.77	4.04	5.09	5.29	3.97	3.52

Index: HRM Policy Benchmark

Growth Over Time - Inception to Date



ITEM # 5-I
Halifax Water Board
September 28, 2023

TO: Colleen Rollings, P.Eng., PMP., Chair, and Members of the Halifax Regional Water Commission Board

SUBMITTED BY: Digitally signed by Heidi Schedler Date: 2023.09.21 14:39:20 -03'00'

Heidi Schedler, KC, Director of Regulatory Affairs, Risk and Governance

APPROVED: Tareq Al-Zabet Digitally signed by Tareq Al-Zabet Date: 2023.09.22 13:50:10 -03'00'

Tareq Al-Zabet, Ph.D., CRSP, P.Geo, CEO & General Manager

DATE: September 20, 2023

SUBJECT: **Nova Scotia Utility & Review Board Compliance Filing**

INFORMATION REPORT

ORIGIN

This report stems from requests and directions from the Nova Scotia Utility and Review Board in various matters. The following reports will be filed with the Nova Scotia Utility and Review Board on September 29, 2023, and are being provided here for your information:

1. 2023 Regulatory Compliance Filing
2. 2023 Institutional Capacity Report
3. 2023 Annual September Filing (Asset Management and Wet Weather Management)

2020 - 21 to 2024 - 25 Capital Expenditure Program	TOTALS					
	All $ in 000's					
	Y1	Y2	Y3	Y4	Y5	Y1 to Y5
	2020-2021	2021-2022	2022-2023	2023-2024	2024-2025	Totals
Water / Wastewater / Stormwater Budget Summary						
Water - Land	$100	$100	$100	$100	$100	$500
Water - Transmission	$10,453	$6,738	$7,894	$8,122	$11,036	$44,243
Water - Distribution	$5,277	$6,595	$6,495	$6,320	$6,495	$31,182
Water - Structures	$10,980	$9,520	$11,197	$5,360	$7,400	$44,457
Water - Treatment Facilities	$15,129	$38,418	$30,438	$25,496	$23,846	$133,327
Water - Energy	$200	$200	$200	$200	$200	$1,000
Water - Security	$50	$50	$50	$50	$50	$250
Water - Equipment	$103	$50	$50	$50	$50	$303
Water - Corporate Projects	$6,638	$12,485	$12,051	$3,623	$3,718	$38,515
Sub Total - Water	$48,930	$74,156	$68,475	$49,321	$52,895	$293,777
Wastewater - Trunk Sewers	$500	$14,025	$2,000	$2,000	$2,000	$20,525
Wastewater - Collection System	$14,473	$24,407	$22,165	$31,582	$26,560	$119,187
Wastewater - Forcemains	$825	$1,000	$1,000	$1,000	$16,100	$19,925
Wastewater - Structures	$8,415	$9,343	$8,144	$5,900	$11,677	$43,479
Wastewater - Treatment Facilities	$5,525	$9,841	$13,286	$39,771	$29,804	$98,227
Wastewater - Energy	$75	$600	$600	$600	$600	$2,475
Wastewater - Security	$200	$200	$200	$200	$0	$800
Wastewater - Equipment	$255	$145	$145	$145	$145	$835
Wastewater - Corporate Projects	$8,180	$13,434	$12,751	$6,246	$6,188	$46,799
Sub Total - Wastewater	$38,448	$72,995	$60,291	$87,444	$93,074	$352,252
Stormwater - Pipes	$2,380	$3,992	$14,469	$5,474	$6,101	$32,416
Stormwater - Culverts/Ditches	$3,107	$2,930	$2,125	$2,950	$2,445	$13,557
Stormwater - Structures	$1,900	$2,100	$500	$1,000	$1,000	$6,500
Stormwater - Security	$0	$0	$0	$0	$0	$0
Stormwater - Equipment	$0	$0	$0	$0	$0	$0
Stormwater - Corporate Projects	$1,750	$2,827	$2,999	$1,017	$1,360	$9,953
Sub Total - Stormwater	$9,137	$11,849	$20,093	$10,441	$10,906	$62,426
TOTALS - Water/Wastewater/Stormwater	$96,514	$158,999	$148,859	$147,205	$156,874	$708,451

Five Year Capital Budget - Water

Project ID	Project Name	Region	All $ in 000's						
			Y1	Y2	Y3	Y4	Y5	Total Y1 to Y5	Future Years
			2020-2021	2021-2022	2022-2023	2023-2024	2024-2025		
Water - Land									
3.033	Watershed Land Acquisition	HRM	$100	$100	$100	$100	$100	$500	$0
Water - Land -- T O T A L S			**$100**	**$100**	**$100**	**$100**	**$100**	**$500**	**$0**
Water - Transmission									
3.042	Critical Valve Replacement Program	HRM	$300	$300	$300	$300	$300	$1,500	$0
3.503	Chain Control Valve Upgrade Program	West	$45					$45	$0
3.581	Transmission Main Monitoring System Pilot	HRM	$200					$200	$0
3.550	Burnside Connextor - Transmission Main Corridor - Rock Trench	East/Central			$815			$815	$0
3.549	Chain Control Transmission - Existing Peninsula Low Upsize	West	$100	$2,013			$1,728	$3,841	$0
3.552	Chain Control Transmission - Existing Peninsula Intermediate Upsize	West	$100	$1,358			$1,192	$2,650	$0
3.553	Peninsula Intermediate Looping - Quinpool Rd to Young St	West					$431	$431	$3,888
3.562	Geizer 158 to Lakeside High Looping	West					$225	$225	$2,000
3.564	Herring Cove Rd Looping - McIntosH Street	West	$228					$228	$0
3.568	Tacoma PRV Chamber	East	$420					$420	$0
3.291	Port Wallace Transmission Main - Caledonia Section	East	$6,000					$6,000	$0
3.571	Highway 118 Crossing - Shubie Park to Dartmouth Crossing	East			$300	$5,763		$6,063	$0
3.554	North End Feeder Replacement	West	$200	$200	$1,731	$1,731	$6,919	$10,781	$16,595
3.572	New Primary Feed to Sackville High	Central						$0	$4,953
3.574	Cobequid Looping	Central				$223	$223	$446	$1,784
3.551	Wellington Connector - Transmission Main Corridor - Rock Trench	Bennery			$505			$505	$0
3.399	Cogswell Interchange - Water Transmission Main Realignments	West	$2,850	$2,850	$2,850			$8,550	$0
3.504	Burnside Expansion Phase 13 - Watermain Oversizing Cost Share	East			$1,220			$1,220	$0
3.045	Bedford West CCC - Various Phases	Central	$5	$2	$28	$5	$18	$58	$0
3.260	Morris (Russell) Lake Estates CCC	East		$15				$15	$0
3.261	Lakeside Timberlea CCC	West	$5			$100		$105	$0
3.343	Northgate Oversizing	Central			$145			$145	$0
Water - Transmission -- T O T A L S			**$10,453**	**$6,738**	**$7,894**	**$8,122**	**$11,036**	**$44,243**	**$29,220**
Water - Distribution									
3.022	Water Distribution - Main Renewal Program	HRM	$3,525	$5,000	$5,175	$5,000	$5,175	$23,875	$0
3.067	Valves Renewals	HRM	$125	$125	$125	$125	$125	$625	$0
3.068	Hydrants Renewals	HRM	$75	$75	$75	$75	$75	$375	$0
3.069	Service Lines Renewals	HRM	$100	$100	$100	$100	$100	$500	$0
3.390	Lead Service Line Replacement Program	HRM	$1,000	$1,000	$1,000	$1,000	$1,000	$5,000	$0
3.294	Automated Flushing Program	HRM	$20	$20	$20	$20	$20	$100	$0
3.334	Coburg Road Bridge Watermain Replacement	West	$300					$300	$0
3.501	South Street CN Bridge Watermain Installation	West	$25	$275				$300	$0
3.296	Water Sampling Station Relocation Program	HRM	$10					$10	$0
3.513	Meadowbrook PRV Chamber - Replace PRV Valves	Central	$35					$35	$0

Five Year Capital Budget - Water

Project ID	Project Name	Region	All $ in 000's						
			Y1	Y2	Y3	Y4	Y5	Total Y1 to Y5	Future Years
			2020-2021	2021-2022	2022-2023	2023-2024	2024-2025		
3.569	Fall River Rechlorination Station	Central	$25					$25	$0
3.573	Spring Garden Road - Water Design Services	West	$37					$37	$0
Water - Distribution -- T O T A L S			**$5,277**	**$6,595**	**$6,495**	**$6,320**	**$6,495**	**$31,182**	**$0**
Water - Structures									
3.262	Chambers, Pumping Stations and Distribution Monitoring Asset Renewal Program	HRM	$0	$350	$350	$350	$350	$1,400	$0
3.512	Eaglewood Pumping Station - New Pump Control Panel	Central	$35					$35	$0
3.514	Steel Reservoir Climbing Systems - Safety Upgrades	HRM	$225	$225				$450	$0
3.116	Bedford South (Hemlock) Reservoir CCC	West	$10,160					$10,160	$0
3.309	Cowie Hill Reservoir Replacement	West	$200	$8,040				$8,240	$0
3.288	Akerley Reservoir Rehabilitation	East		$300	$5,100			$5,400	$0
3.515	Meadowbrook Reservoir Overflow Pipe Replacement	Central	$70					$70	$0
3.517	Mount Edward Control Chamber - Extension of Power Supply	East	$20					$20	$0
3.508	Beaver Bank Reservoir Rehabilitation	Central			$720			$720	$0
3.509	Aerotech Reservoir Rehabilitation	Aerotech			$200	$2,160		$2,360	$0
	Aerotech Storage	Aerotech		$400	$4,352			$4,752	$0
3.511	Stokil Reservoir Rehabilitation	Central					$300	$300	$5,330
3.510	Mount Edward 2 Steel Reservoir Rehabilitation	East				$300	$5,100	$5,400	$0
3.453	Geizer 123 Reservoir Rehabilition	West			$150	$2,400		$2,550	$0
3.454	Robie Street Reservoir Rehabilitation	West				$150	$1,650	$1,800	$0
3.523	Lake Major Dam - Site Improvements	East	$240					$240	$0
3.528	Beaver Bank Booster Station - Pump Upgrades	Central	$30	$180				$210	$0
3.561	Prince Albert PRV Chamber Replacement	East		$25	$325			$350	$0
Water - Structures -- T O T A L S			**$10,980**	**$9,520**	**$11,197**	**$5,360**	**$7,400**	**$44,457**	**$5,330**
Water - Treatment Facilities									
	JD Kline Water Supply Plant:								
3.264	JD Kline WSP Upgrade Program	W/C				$300		$300	$0
3.541	JD Kline WSP - Process Upgrades - Phase 1 - New Clarifier and Pre-Treatment	W/C	$1,475	$16,220	$12,535	$3,690		$33,920	$0
3.542	JD Kline WSP - Process Upgrades - Phase 1 - Backwash Optimization	W/C	$1,700	$1,700				$3,400	$0
3.543	JD Kline WSP - Process Upgrades - Phase 1 - Building Improvements	W/C	$110	$1,440	$1,000			$2,550	$0
3.544	JD Kline WSP - Process Upgrades - Phase 1 - Raw Water Pumping Station	W/C			$670	$5,975	$6,900	$13,545	$1,725
3.545	JD Kline WSP - Process Upgrades - Phase 1 - Lagoon Upgrades	W/C				$740	$3,900	$4,640	$3,840
3.546	JD Kline WSP - Process Upgrades - Phase 1 - Pilot Plant Replacement	W/C					$150	$150	$1,550
3.141	JD Kline WSP - Pumping Station - Raw Water Valve Actuators Replacement	W/C	$100	$100	$100			$300	$0
3.428	JD Kline WSP - Caustic Tank Liner Replacements	W/C	$25					$25	$0
3.465	JD Kline WSP - Low Lift Pump Replacements	W/C	$1,120	$1,000				$2,120	$0
3.351	JD Kline WSP - Replace Westinghouse Electrical Panels	W/C	$8	$8	$8	$8	$8	$40	$0
3.530	JD Kline WSP - Alum Tank Liner Replacement	W/C	$45					$45	$0
3.531	JD Kline WSP - New Ultrasonic Level Transmitter	W/C	$10					$10	$0

Five Year Capital Budget - Water

Project ID	Project Name	Region	All $ in 000's						
			Y1	Y2	Y3	Y4	Y5	Total Y1 to Y5	Future Years
			2020-2021	2021-2022	2022-2023	2023-2024	2024-2025		
3.472	JD Kline WSP - Replace Floc Tank Valve Actuators	W/C	$35					$35	$0
3.374	JD Kline WSP - Replace Filter Isolation Gates Program	W/C	$300	$300	$300	$300	$300	$1,500	$0
3.463	JD Kline WSP - New Fluoride Supply Line	W/C		$15				$15	$0
3.431	JD Kline WSP - Fluoride Tank Liner Replacement	W/C		$19				$19	$0
3.475	JD Kline WSP - Low Lift Station Intake Structure Concrete Rehabilitation	W/C			$160			$160	$0
	Lake Major Water Supply Plant:								
3.532	Lake Major WSP - Phase 1 - Temporary Side Stream	East	$3,320	$2,990	$1,330			$7,640	$0
3.533	Lake Major WSP - Phase 1 - New Clarifiers and Pre-Treatment	East	$1,770	$9,290	$7,520	$1,770		$20,350	$0
3.534	Lake Major WSP - Phase 1 - Filtration System Replacement	East	$370			$4,055	$4,055	$8,480	$0
3.535	Lake Major WSP - Phase 1 - Raw Water Pump Station	East	$265	$665	$4,380	$5,710	$4,250	$15,270	$0
3.536	Lake Major WSP - Phase 1 - Building Additions	East	$184	$2,396	$1,660			$4,240	$0
3.537	Lake Major WSP - Phase 1 - New Pilot Plant	East			$150	$1,550		$1,700	$0
3.538	Lake Major WSP - Phase 1 - Residuals Management	East				$738	$3,908	$4,646	$3,834
3.162	Lake Major WSP - Butterfly valve replacement program	East	$350	$350				$700	$0
3.507	Lake Major WSP - New Boat Launch	East	$42					$42	$0
3.321	Lake Major WSP - Replace Fluoride Tank and Piping	East	$250					$250	$0
3.557	Lake Major WSP - Sludge Drying Beds Improvements	East	$500	$500				$1,000	$0
3.526	Lake Major WSP - Roof Replacement	East	$400					$400	$1,000
3.506	Lake Major WSP - Driveway Pavement Renewal	East		$0				$0	$390
3.560	Lake Major WSP - Emergency Pumps - Sitework Preparations	East	$320					$320	$0
3.524	Lake Major WSP - Fuel Storage for Generator at Low Lift Station	East	$135					$135	$0
	Bennery Lake Water Supply Plant:								
3.267	Bennery Lake WSP - Upgrade Program	Bennery	$0	$225	$225	$0	$225	$675	$0
3.477	Aerotech Booster Station Capital Upgrades	Aerotech	$200	$800				$1,000	$0
3.488	Bennery Lake WSP - Surge Anticipator Valves Replacement	Bennery	$100					$100	$0
3.486	Bennery Lake WSP - Access Road Upgrade	Bennery	$1,500					$1,500	$0
3.489	Bennery Lake WSP - Manganese Removal Strategy	Bennery			$100	$435		$535	$0
	Non - Urban Core Water Supply Plant:								
3.266	Non-Urban Core WSP Upgrade program	HRM		$150	$150	$150	$150	$600	$0
3.582	Bomont Equipment Upgrade	HRM	$150					$150	$0
3.518	Pump Replacement Program - Small Systems	HRM	$45					$45	$0
3.455	Reservoir Mixing and Residuals Management Upgrade Program	HRM	$300	$250	$150	$75		$775	$0
Water - Treatment Facilities -- T O T A L S			**$15,129**	**$38,418**	**$30,438**	**$25,496**	**$23,846**	**$133,327**	**$12,339**
Water - Energy									
3.221	Energy Management Capital Program (Water)	HRM	$100	$100	$100	$100	$100	$500	$0
3.107	Chamber HVAC Retro-Commissioning Program	HRM	$100	$100	$100	$100	$100	$500	$0
Water - Energy -- T O T A L S			**$200**	**$200**	**$200**	**$200**	**$200**	**$1,000**	**$0**

Five Year Capital Budget - Water

Project ID	Project Name	Region	All $ in 000's						
			Y1	Y2	Y3	Y4	Y5	Total Y1 to Y5	Future Years
			2020-2021	2021-2022	2022-2023	2023-2024	2024-2025		
Water - Security									
4.009	Security Upgrade Program	HRM	$50	$50	$50	$50	$50	$250	$0
Water - Security -- T O T A L S			**$50**	**$50**	**$50**	**$50**	**$50**	**$250**	**$0**
Water - Equipment									
3.101	Miscellaneous Equipment Replacement	HRM	$50	$50	$50	$50	$50	$250	$0
3.502	Leak Detection Equipment	HRM	$8					$8	$0
3.516	Purchase Hydraulic Saws	HRM	$45					$45	$0
Water - Equipment -- T O T A L S			**$103**	**$50**	**$50**	**$50**	**$50**	**$303**	**$0**
TOTALS - Water			**$42,292**	**$61,671**	**$56,424**	**$45,698**	**$49,177**	**$255,262**	**$46,889**

Five Year Capital Budget - Wastewater

Project ID	Project Name	Region	All $ in 000's						
			Y1	Y2	Y3	Y4	Y5	Total Y1 to Y5	Future Years
			2020-2021	2021-2022	2022-2023	2023-2024	2024-2025		
Wastewater - Trunk Sewers									
2.526	Wastewater Trunk Sewer Asset Renewal Program	HRM			$2,000	$2,000	$2,000	$6,000	$0
2.822	Odour Level of Service and Optimization Review	West	$100					$100	$0
2.467	Kearney Lake Road Wastewater Sewer Upgrades	West						$0	$4,100
2.584	Fairview Cove Trunk Sewer	West	$400	$14,025				$14,425	$0
Wastewater - Trunk Sewers -- T O T A L S			**$500**	**$14,025**	**$2,000**	**$2,000**	**$2,000**	**$20,525**	**$4,100**
Wastewater - Collection System									
2.052	Integrated Wastewater Projects - Program	HRM	$2,000	$1,700	$1,800	$1,700	$1,840	$9,040	$0
2.168	Wastewater System - Trenchless Rehabilitation Program	HRM	$3,000	$2,000	$2,000	$2,000	$2,000	$11,000	$0
2.504	Collection System Asset Renewal Program	HRM			$0	$500	$500	$1,000	$0
2.830	Eastern Passage RDII Reduction Program FMZ24	East				$862	$707	$1,569	$0
2.831	Eastern Passage RDII Reduction Program FMZ37	East		$1,364	$1,116			$2,480	$0
2.832	Mill Cove RDII Reduction Program FMZ07 & FMZ40	Central		$3,271	$2,500	$1,241		$7,012	$0
2.833	Mill Cove RDII Reduction Program FMZ10	Central				$157	$1,414	$1,571	$0
2.834	Ellenvale area RDII Reduction Program	East			$370	$1,667	$1,667	$3,704	$0
2.835	LoWSCA: Canal Street Separation	East			$184	$829	$829	$1,842	$0
2.836	Wyse Road Separation Phase 1	East	$386	$1,737	$1,737			$3,860	$0
2.837	Wyse Road Separation Phase 2	East			$280	$1,261	$1,261	$2,802	$0
2.838	Albro Lakes Watershed Separation	East	$811	$3,650	$3,650			$8,111	$0
2.839	Eastern Passage Gravity Pressure Sewer	East		$300	$2,037	$5,843	$5,843	$14,023	$11,686
2.840	Eastern Passage Gravity Pressure Sewer - Install new pump out stations	East				$168	$168	$336	$1,340
2.841	Local network upgrades on Beaver Bank Road - Design (and North of Glendale Drive)	Central	$176	$138	$939	$939		$2,192	$0
2.842	Local network upgrades on Beaver Bank Road. At Galloway Drive	Central	$0		$100	$670	$670	$1,440	$0
2.843	Local network upgrades on Beaver Bank Road. By Windgate Drive	Central	$0		$111	$750	$750	$1,611	$0
2.844	Atlantic Street Upgrade	East		$50		$383	$383	$816	$3,015
2.845	Pleasant Street Upgrade	East				$77	$690	$767	$0
2.852	Maynard Lake and Clement Street Wetland Separation	East			$642	$4,540	$1,155	$6,337	$453
2.692	Cogswell Redevelopment - Sewer Relocation	West	$1,000	$1,000	$1,000			$3,000	$0
2.557	Punch Bowl PS Eliminiation	West	$100	$2,320				$2,420	$0
2.746	Sewer Relocation at South Street CN Bridge	West	$450					$450	$0
2.437	Hines Road Rider Sewer Extension	East	$80	$400				$480	$0
2.356	Auburn Avenue PS Elimination	West		$60	$645			$705	$0
2.357	Manhole Renewals WW	HRM	$25	$25	$28	$28	$28	$134	$0
2.358	Lateral Replacements WW (non-tree roots)	HRM	$1,720	$1,750	$1,785	$1,820	$1,856	$8,931	$0
2.563	Lateral Replacements WW (tree roots)	HRM	$541	$552	$567	$582	$594	$2,836	$0
2.223	Wet Weather Management Program	HRM	$350	$350	$350	$350	$350	$1,750	$0
2.074	Bedford West Collection System CCC	West	$39		$24			$63	$0

Five Year Capital Budget - Wastewater

Project ID	Project Name	Region	All $ in 000's						
			Y1	Y2	Y3	Y4	Y5	Total Y1 to Y5	Future Years
			2020-2021	2021-2022	2022-2023	2023-2024	2024-2025		
	- WRWIP PROJECTS							$0	$0
2.672	Young Street - Sewer Separation	West	$100	$1,430				$1,530	$0
2.674	South Park Street - Sewer Separation	West	$3,270					$3,270	$0
2.679	College Street - Sewer Separation	West	$100	$2,310				$2,410	$0
2.675	Bayers Road Phase 1 - Sewer Separation	West			$100	$1,375		$1,475	$0
2.743	Spring Garden Road Phase 1 - Sewer Separation	West			$100	$1,880		$1,980	$0
1.233	Spring Garden Road Phase 2 - Sewer Separation	West				$100	$1,570	$1,670	$0
2.742	Windsor - Almon - Sewer Separation	West				$100	$2,285	$2,385	$0
2.744	Young Street Pocket - Sewer Separation - Side Streets	West			$100	$1,760		$1,860	$0
2.526	Prince Albert Road Sewer Separation - Side Streets	East	$325					$325	$0
Wastewater - Collection System -- T O T A L S			**$14,473**	**$24,407**	**$22,165**	**$31,582**	**$26,560**	**$119,187**	**$16,494**
Wastewater - Forcemains									
2.080	Forcemain Replacement Program	HRM		$400	$1,000	$1,000	$1,000	$3,400	$0
2.823	Akerley Blvd Forcemain Replacement	East	$65	$600				$665	$0
2.819	Pumping Station Oil Tank Replacements	HRM	$60					$60	$0
2.820	Morris Lake Forcemain Investigation and Rehabilitation	East	$500					$500	$0
2.608	New Timberlea Pump Station Forcemain System	West	$200				$15,100	$15,300	$0
Wastewater - Forcemains -- T O T A L S			**$825**	**$1,000**	**$1,000**	**$1,000**	**$16,100**	**$19,925**	**$0**
Wastewater - Structures									
2.420	Emergency Pumping Station Pump Replacements	HRM	$250	$250	$250	$250	$250	$1,250	$0
2.442	Wastewater Pumping Station Component Replacement Program - West Region	West	$200	$200	$200	$200	$200	$1,000	$0
2.443	Wastewater Pumping Station Component Replacement Program - East Region	East	$200	$200	$200	$200	$200	$1,000	$0
2.444	Wastewater Pumping Station Component Replacement Program - Central Region	Central	$250	$250	$250	$250	$250	$1,250	$0
2.476	Wastewater Pumping Station Asset Renewal Program	HRM			$0	$4,000	$4,000	$8,000	$0
2.818	Jamieson Pumping Station - Automatic Bar Screen	East	$60	$840				$900	$0
2.853	Fairfield Holding Tank - Concept Design	West	$150					$150	$0
2.824	Bruce Street Pumping Station Relocation	East	$150	$1,380				$1,530	$0
2.827	Wastewater Pumping Station Generator Plug/Switch Installations	HRM	$125					$125	$0
2.825	First Lake Pumping Station Upgrades	Central	$70	$640				$710	$0
2.654	PS Control Panel / Electrical Replacement	HRM	$725					$725	$0
2.829	Armcrest Pumping Station - Piping and Valve Upgrades	Central	$71					$71	$0
2.005	Autoport Pleasant Street PS Replacement	East	$3,000					$3,000	$0
2.660	Bissett PS Component Upgrade	East	$50	$1,200				$1,250	$0
2.655	Roach's Pond PS Component Upgrade	West	$550					$550	$0
2.088	Russell Lake PS Upgrade	East	$0	$2,475				$2,475	$0
2.093	Windmill Road PS Replacement	East	$1,355					$1,355	$0
2.665	CSO Upgrade Program	HRM	$300	$300	$1,000	$1,000	$1,000	$3,600	$0

Five Year Capital Budget - Wastewater

Project ID	Project Name	Region	All $ in 000's						
			Y1	Y2	Y3	Y4	Y5	Total Y1 to Y5	Future Years
			2020-2021	2021-2022	2022-2023	2023-2024	2024-2025		
2.459	William's Lake PS Rehabilition	West	$100		$2,710			$2,810	$0
2.740	Duffus PS CSO - Modification	West	$100		$2,240			$2,340	$0
2.846	Upgrade Quigley Corner Pumping Station	East	$287	$1,294	$1,294			$2,875	$0
2.847	Optimize Quigley Corner Pumping Station	East	$22	$314				$336	$0
2.609	New Timberlea Pumping Station	West	$400				$5,560	$5,960	$0
2.617	WRWIP_YoungeStreet: Upgrade Young Pumping Station Capacity - Pumps_YNG_PS	West					$217	$217	$1,952
Wastewater Structures -- T O T A L S			**$8,415**	**$9,343**	**$8,144**	**$5,900**	**$11,677**	**$43,479**	**$1,952**
Wastewater - Treatment Facility									
2.056	Plant Optimization Program	HRM	$125	$125	$125	$125	$125	$625	$0
2.522	Emergency Wastewater Treatment Facility equipment replacements	HRM	$400	$400	$400	$400	$400	$2,000	$0
2.668	Wastewater Research Program Pilot Plant	HRM	$300					$300	$0
2.564	Carbon Media Replacement	HRM		$50			$50	$100	$0
2.849	HHSP - OCS H2S Analysers	HRM	$60					$60	$0
2.720	Harbour WWTFs - Outfall Inspection Program	HRM					$30	$30	$0
2.701	HHSP - OCS Wet Scrubber Chlorine Analyzers	HRM	$60					$60	$0
	Halifax Wastewater Treatment Facility:								
2.506	Halifax WWTF - Asset Renewal Program	West			$750	$750	$750	$2,250	$0
2.532	Halifax WWTF - Duct Work Replacement	West	$50	$50	$50	$50	$50	$250	$0
2.765	Halifax WWTF - Raw Water Pump Refurbishment	West	$50	$50	$50	$50	$50	$250	$0
2.767	Halifax WWTF - Fixed Gas Meters - Replacement	West	$150					$150	$0
2.768	Halifax WWTF - New Coagulant Dosing System	West	$100					$100	$0
2.769	Halifax WWTF - New Polymer Dosing System	West	$40					$40	$0
2.770	Halifax WWTF - Sludge Pumps - New Mechanical Seals	West	$60					$60	$0
2.706	Halifax WWTF - Desadeg Hydraulic Optimization	West	$100					$100	$0
2.762	Halifax WWTF - Fine Screens - Replace with Perforated Plate Screens	West		$1,900				$1,900	$0
2.772	Halifax WWTF - Grit System - Parts Replacements and New Screws	West	$50	$150				$200	$0
2.773	Halifax WWTF - Industrial Water System - Replacement	West	$50	$0				$50	$0
2.774	Halifax WWTF - UV Disinfection System - New Modules and PLC Upgrade	West			$900			$900	$0
2.775	Halifax WWTF - UV Disinfection System - New Automatic Level Controls	West			$500			$500	$0
2.776	Halifax WWTF - Sludge Dewatering - Fournier Press Upgrades	West	$50	$1,000				$1,050	$0
2.777	Halifax WWTF - Densadegs - Sludge Scraper Rebuilds (x2)	West		$100				$100	$0
2.778	Halifax WWTF - Densadegs - Mixer Gearbox Rebuilds	West		$70	$70	$70		$210	$0
2.779	Halifax WWTF - Densadegs - Lamella Tube Settler Upgrades	West		$800				$800	$0
	Dartmouth Wastewater Treatment Facility:								
2.507	Dartmouth WWTF - Asset Renewal Program	East	$0	$500	$500	$500	$500	$2,000	$0
2.502	Dartmouth WWTF - Duct Work Replacement	East	$50	$50	$50	$50	$50	$250	$0
2.781	Dartmouth WWTF - Fine Screens - New Perforated Plate Screens	East	$1,800					$1,800	$0

Five Year Capital Budget - Wastewater

Project ID	Project Name	Region	All $ in 000's						
			Y1	Y2	Y3	Y4	Y5	Total Y1 to Y5	Future Years
			2020-2021	2021-2022	2022-2023	2023-2024	2024-2025		
2.783	Dartmouth WWTF - New Coagulant Dosing System	East	$100					$100	$0
2.784	Dartmouth WWTF - New Polymer Dosing System	East	$40					$40	$0
2.707	Dartmouth WWTF - Densadegs - CFD Analysis and Flow Diversion Vanes	East	$110					$110	$0
2.785	Dartmouth WWTF - Heat Exchangers - Refurbishment	East	$40					$40	$0
2.787	Dartmouth WWTF - Sludge Pumps - New Mechanical Seals	East	$60					$60	$0
2.788	Dartmouth WWTF - UV Disinfection System - New Modules and PLC Upgrade	East		$775				$775	$0
2.789	Dartmouth WWTF - UV Disinfection System - New Automatic Level Controls	East		$500				$500	$0
2.790	Dartmouth WWTF - Fournier Press - Sludge Dewatering Upgrade	East				$800		$800	$0
2.791	Dartmouth WWTF - Desadegs - Lamella Tube Settler Replacements	East	$300	$300				$600	$0
2.850	Dartmouth WWTF - Ballasted Flocculation Pilot	East	$75					$75	$0
2.855	Dartmouth WWTF - Industrial Water System Replacement	East	$50					$50	$0
2.851	Dartmouth WWTF - New Coarse Screen	East					$400	$400	$0
	Herring Cove Wastewater Treatment Facility:								
2.508	Herring Cove WWTF - Asset Renewal Program	West	$0	$250	$250	$250	$250	$1,000	$0
2.639	Herring Cove WWTF - Duct Work Replacement Program	West	$50	$50	$50	$50	$50	$250	$0
2.794	Herring Cove WWTF - Spare Sludge Tank Mixer	West	$25					$25	$0
2.795	Herring Cove WWTF - Sludge Pumps - New Mechanical Seals	West	$40					$40	$0
2.796	Herring Cove WWTF - New Coagulant Dosing System	West	$30					$30	$0
2.797	Herring Cove WWTF - Heat Exchangers - Refurbishment	West	$40					$40	$0
2.798	Herring Cove WWTF - Waste Oil System - New Waste Oil Tank	West	$15					$15	$0
2.799	Herring Cove WWTF - Electrical System - Spare Transfer Switch	West	$40					$40	$0
2.856	Herring Cove WWTF - Industrial Water System Replacement	West	$50					$50	$0
2.800	Herring Cove WWTF - Densadegs - Lamella Tube Settler Replacement	West		$400				$400	$0
2.801	Herring Cove WWTF - Fine Screens - New Perforated Plate Screens	West			$1,500			$1,500	$0
2.802	Herring Cove WWTF - UV Disinfection System - New Automatic Level Controls	West				$400		$400	$0
2.803	Herring Cove WWTF - Ballasted Flocculation Upgrades	West				$3,500		$3,500	$0
	Mill Cove Wastewater Treatment Facility:								
2.505	Mill Cove WWTF - Asset Renewal Program	Central		$350	$350			$700	$0
2.804	Mill Cove WWTF - OCS Carbon Replacements	Central	$0	$40	$40			$80	$0
2.640	Mill Cove WWTF - Process Upgrades - Preliminary + Detailed Design	Central		$901	$901			$1,802	$0
2.817	Mill Cove WWTF - Plant Upgrade - Design and Contract Admin	Central			$5,850	$5,850		$11,700	$0
2.805	Mill Cove WWTF - Plant Upgrade - Construction and Commissioning	Central				$25,499	$25,499	$50,998	$25,500
	Eastern Passage Wastewater Treatment Facility:								
2.666	Eastern Passage WWTF - Asset Renewal Program	East	$0	$150	$150	$150	$150	$600	$0
2.468	Eastern Passage WWTF - Process Upgrade Program	East	$0	$0	$0	$0	$0	$0	$0
2.646	Eastern Passage WWTF - Secondary Launder Covers	East	$150					$150	$0
2.806	Eastern Passage WWTF - Carbon Replacement	East	$0	$120				$120	$0

Five Year Capital Budget - Wastewater

Project ID	Project Name	Region	All $ in 000's						
			Y1	Y2	Y3	Y4	Y5	Total Y1 to Y5	Future Years
			2020-2021	2021-2022	2022-2023	2023-2024	2024-2025		
2.807	Eastern Passage WWTF - UV Disinfection System - Spare Parts	East		$40				$40	$0
2.808	Eastern Passage WWTF - New Yard Tractor	East				$12		$12	$0
	Aerotech Wastewater Treatment Facility:								
2.667	Aerotech WWTF - Asset Renewal Program	Aerotech		$150	$200	$250	$250	$850	$0
2.809	Aerotech WWTF - Road Rehabilition	Aerotech	$25					$25	$0
2.810	Aerotech WWTF - Bioreactors - Short Circuiting Modifications	Aerotech	$200					$200	$0
2.811	Aerotech WWTF - Lab - HVAC Modifications	Aerotech	$75					$75	$0
2.812	Aerotech WWTF - Centrifuge - Rebuild	Aerotech	$50		$50		$50	$150	$0
2.814	Aerotech WWTF - Lagoon Dredging	Aerotech					$600	$600	$0
	Timberlea Wastewater Treatment Facility:								
2.509	Asset Renewal Program	West		$50	$50			$100	$0
2.647	Decommissioning	West				$500		$500	$0
2.816	Timberlea WWTF - Grit System - Chain and Bucket Replacement	West	$50					$50	$0
	Community Wastewater Treatment Facility:								
2.050	Community WWTFs - Asset Renewal Program	HRM	$0	$250	$250	$250	$250	$1,000	$0
2.761	Springfield Lake - Driveway Refurbishment	HRM	$15					$15	$0
	Biosolids Processing Facility:								
2.126	Biosolids Processing Facility - Asset Renewal Program	HRM				$250	$250	$500	$0
2.857	Biosolids Processing Facility - Building Upgrades	HRM	$250					$250	$0
2.732	Biosolids Processing Facility - Conveyor CS1 Liners	HRM	$30					$30	$0
2.733	Biosolids Processing Facility - Biofilter Media	HRM	$50		$50		$50	$150	$0
2.815	Biosolids Processing Facility - Dryer Upgrades	HRM	$70					$70	$0
2.734	Biosolids Processing Facility - Serpentix Conveyor Refurbishment	HRM		$30				$30	$0
2.735	Biosolids Processing Facility - Live Bottom Bin Rebuild	HRM		$150				$150	$0
2.513	Biosolids Processing Facility - Silo Painting	HRM		$90				$90	$0
2.736	Biosolids Processing Facility - CS1 Conveyor Replacement	HRM			$200			$200	$0
2.737	Biosolids Processing Facility - Scissor Lift Replacement	HRM				$15		$15	$0
Wastewater - Treatment Facility -- T O T A L S			**$5,525**	**$9,841**	**$13,286**	**$39,771**	**$29,804**	**$98,227**	**$25,500**
Wastewater - Energy									
2.362	Energy Management Capital Program (Wastewater)	HRM		$500	$500	$500	$500	$2,000	$0
2.491	Pump Station HVAC Retro-Commissioning Program	HRM		$100	$100	$100	$100	$400	$0
2.650	HHSP - BAS + HVAC Recommissioning	HRM	$50					$50	$0
2.651	Wastewater Pump Stations - NSPI Meter Relocations	HRM	$25					$25	$0
Wastewater - Energy -- T O T A L S			**$75**	**$600**	**$600**	**$600**	**$600**	**$2,475**	**$0**
Wastewater - Security									
4.008	Security Upgrade Program	HRM	$200	$200	$200	$200		$800	$0
Wastewater - Security -- T O T A L S			**$200**	**$200**	**$200**	**$200**	**$0**	**$800**	

Five Year Capital Budget - Wastewater

Project ID	Project Name	Region	All $ in 000's						
			Y1	Y2	Y3	Y4	Y5	Total Y1 to Y5	Future Years
			2020-2021	2021-2022	2022-2023	2023-2024	2024-2025		
Wastewater - Equipment									
2.161	I&I Reduction (SIR) Program Flow Meters and Related Equipment	HRM	$25	$25	$25	$25	$25	$125	$0
2.451	Miscellaneous Equipment Replacement	HRM	$120	$120	$120	$120	$120	$600	$0
2.821	Duffus Street PS Flow Meter Replacement	West	$110					$110	$0
Wastewater - Equipment -- T O T A L S			**$255**	**$145**	**$145**	**$145**	**$145**	**$835**	**$0**
TOTALS - Wastewater			**$30,268**	**$59,561**	**$47,540**	**$81,198**	**$86,886**	**$305,453**	**$48,046**

Five Year Capital Budget - Stormwater

Project ID	Project Name	Region	All $ in 000's						
			Y1	Y2	Y3	Y4	Y5	Total Y1 to Y5	Future Years
			2020-2021	2021-2022	2022-2023	2023-2024	2024-2025		
Stormwater - Pipes									
1.108	Stormwater Pipe Asset Renewal Program	HRM				$4,000	$4,700	$8,700	$0
1.140	Stormwater Main Sewer Lining - Program	HRM		$100	$100	$100	$100	$400	$0
1.038	Integrated Stormwater Projects - Program	HRM	$1,000	$1,000	$1,000	$1,000	$1,000	$5,000	$0
1.102	Manhole Renewals SW	HRM	$15	$16	$16	$17	$17	$81	$0
1.103	Catchbasin Renewals SW	HRM	$60	$63	$65	$68	$70	$326	$0
1.135	Lateral Replacements SW	HRM	$12	$13	$13	$14	$14	$66	$0
1.204	National Disaster Mitigation Program	HRM		$50	$100	$200	$200	$550	$0
1.134	Stormwater Quality Compliance Needs Assessment from IRP	HRM			$75	$75		$150	$0
1.145	Sullivan's Pond Storm Sewer System Replacement - Phase 2 Irishtown Rd to Harbour	East	$25	$350	$11,000			$11,375	$0
1.034	Raymond Street, Phase 2 - Storm Sewer Rehabilitation	East	$100	$1,000	$750			$1,850	$0
1.188	Cogswell Redevelopment - SW Sewer Relocation	West	$955	$1,350	$1,350			$3,655	$0
1.201	Stormwater Pipe Condition Inspections (CSP)	HRM	$50	$50	$0	$0	$0	$100	$0
1.223	Rocky Lake and Bedford Highway Intersection Storm Sewer Upgrade	West	$75					$75	$0
1.224	Thistle Street Storm Drainage System Upgrade - Preliminary Engineering	East	$50					$50	$0
1.227	Stormwater System Upgrade near Civic #1681 Waverley Road	East	$38					$38	$0
Stormwater - Pipes -- T O T A L S			**$2,380**	**$3,992**	**$14,469**	**$5,474**	**$6,101**	**$32,416**	**$0**
Stormwater - Culverts/Ditches									
1.104	Driveway Culvert Replacement Program	HRM	$1,200	$930	$925	$950	$945	$4,950	$0
1.109	Cross Culvert Renewal Program	HRM	$0	$2,000	$1,200	$2,000	$1,500	$6,700	$0
	Street Specific Culvert Replacement:								
1.205	Kipawa Crescent	Central	$400					$400	$0
1.125	Coronet Avenue Driveway Culvert Replacement Project	West	$925					$925	$0
1.147	Cole Harbour Road (near #1560) - Culvert Replacement	East	$350					$350	$0
1.183	St Margarets Bay Rd, near Civic 2797 - Culvert Replacement	West	$80					$80	$0
1.228	Blue Forest Lane, near civic 42	Central	$38					$38	$0
1.229	Devils Hill Rd at Boulderbrook Lane	West	$38					$38	$0
1.231	Ketch Harbour Rd, near civic 31	West	$38					$38	$0
1.232	Waverley Rd, near civic 832	East	$38					$38	$0
Stormwater - Culverts/Ditches -- T O T A L S			**$3,107**	**$2,930**	**$2,125**	**$2,950**	**$2,445**	**$13,557**	**$0**
Stormwater - Structures									
1.133	Ellenvale Run Retaining Wall System - Replacement	East			$500	$1,000	$1,000	$2,500	$0
1.225	Ellenvale Run Retaining Wall - Phase 2	East	$1,900					$1,900	$0
1.226	Ellenvale Run Retaining Wall - Phase 3 (Wanda Lane)	East		$2,100				$2,100	$0
Stormwater - Structures -- T O T A L S			**$1,900**	**$2,100**	**$500**	**$1,000**	**$1,000**	**$6,500**	**$0**
TOTALS - Stormwater			**$7,387**	**$9,022**	**$17,094**	**$9,424**	**$9,546**	**$52,473**	**$0**

Five Year Capital Budget - Corporate Projects

Project ID	Project Name	Region	All $ in 000's						
			Y1	Y2	Y3	Y4	Y5	Total Y1 to Y5	Future Years
			2020-2021	2021-2022	2022-2023	2023-2024	2024-2025		
Corporate - Information Technology									
4.031	IT Strategic Projects	HRM				$3,770	$4,150	$7,920	$0
4.097	Analytics Decision Support System	HRM	$335	$350	$150			$835	$0
4.102	Approval Forms Framework	HRM		$280	$250			$530	$0
4.111	Asset Condition	HRM	$125	$190	$190			$505	$0
4.151	Capital Planning	HRM	$100	$500	$1,000	$100		$1,700	$0
4.105	Cityworks Upgrade	HRM		$200		$200		$400	$0
4.083	Computerized Maintenance Management System (CMMS) Enhancements	HRM	$1,000	$500	$1,000	$100		$2,600	$0
4.011	Desktop Computer Replacement Program	HRM	$350	$350	$350	$350	$350	$1,750	$0
4.146	Disaster Recovery	HRM	$630					$630	$0
4.147	Document Management SharePoint Rollout	HRM	$300					$300	$0
4.149	Electronic Content Management Linkage	HRM			$200			$200	$0
4.126	Full Enterprise Data Warehouse	HRM	$200	$300	$300			$800	$0
4.153	General Analytic Tool	HRM		$400				$400	$0
4.131	HR Training and Benefits	HRM		$320				$320	$0
4.012	Network Upgrades	HRM	$280	$280	$280	$280	$280	$1,400	$0
4.101	Mobile Devices and Applications	HRM		$600				$600	$0
4.095	New CRM with Integration	HRM		$200	$1,000			$1,200	$0
4.121	New Payroll System	HRM	$230					$230	$0
4.048	SAP Rate Structure Support	HRM	$220		$220		$220	$660	$0
4.150	Enterprise Resource Planning Solution	HRM	$2,630	$1,580	$200	$200		$4,610	$0
4.130	Team Collaboration	HRM			$230			$230	$0
4.107	Customer Portal	HRM	$50	$50				$100	$0
4.152	Security Projects	HRM	$300	$100				$400	$0
Corporate - Information Technology -- T O T A L S			**$6,750**	**$6,200**	**$5,370**	**$5,000**	**$5,000**	**$28,320**	**$0**
Corporate - GIS									
4.040	GIS Data Program	HRM	$100	$250	$100	$250	$100	$800	$0
4.115	GIS Data Build - Services (ICI)	HRM	$150	$150	$0	$0	$0	$300	$0
4.010	Sewer Service Entry	HRM	$250	$150	$0	$0	$0	$400	$0
4.116	GIS Data Project	HRM	$150	$0	$100	$0	$200	$450	$0
4.038	GIS Hardware/Software Program	HRM	$50	$50	$50	$50	$50	$250	$0
4.039	GIS Application Support Program	HRM	$150	$150	$150	$150	$150	$750	$0
4.059	Utility Network modeling/Data Modeling	HRM	$50	$250	$250	$50	$50	$650	$0
4.118	Engineering Drawing Database	HRM	$100	$50		$100	$50	$300	$0
4.155	Stormwater Biling Imagery Acquisition and Analysis	HRM	$350		$350		$350	$1,050	$0
Corporate - GIS -- T O T A L S			**$1,350**	**$1,050**	**$1,000**	**$600**	**$950**	**$4,950**	**$0**
Corporate - Asset Management									
4.020	Asset Management Program Development	HRM		$100	$100	$100	$100	$400	$0

Five Year Capital Budget - Corporate Projects

Project ID	Project Name	Region	All $ in 000's						
			Y1	Y2	Y3	Y4	Y5	Total Y1 to Y5	Future Years
			2020-2021	2021-2022	2022-2023	2023-2024	2024-2025		
2.523	Wastewater Sewer Condition Assessment	HRM	$215	$220	$225	$230	$235	$1,125	$0
1.156	Storm Sewer Condition Assessment	HRM	$95	$100	$105	$110	$115	$525	$0
2.043	Corporate Flow Monitoring Program	HRM	$1,870	$2,000	$2,000	$2,000	$2,000	$9,870	$0
4.113	Vulnerability to Climate Change Risk Assessment - Asset Class Pilot	HRM	$250	$275	$250			$775	$0
2.562	Outfall Assessment Project	HRM	$20					$20	$0
4.140	SSO Management Program	HRM	$100					$100	$0
4.141	System Constraints Analysis HRM (Was East Additional Flow Monitoring)	HRM	$252					$252	$0
4.143	Safe Yield Study	HRM	$200					$200	$0
4.144	New Hydraulic Water Model (InfoWater)	HRM	$200					$200	$0
4.145	Transmission Main Risk Assessment and Prioritization Framework	HRM	$50					$50	$0
Corporate - Asset Management -- T O T A L S			**$3,252**	**$2,695**	**$2,680**	**$2,440**	**$2,450**	**$13,517**	**$0**
Corporate - Facility									3
2.176	East/Central Regional Operational Facility	East	$2,000	$16,000	$16,000			$34,000	$0
4.077	Building Capital Improvements	West	$185	$100	$100	$100	$100	$585	$0
3.221	Energy Managerment Capital Program	HRM	$100	$100	$100	$100	$100	$500	$0
Corporate - Facility -- T O T A L S			**$2,285**	**$16,200**	**$16,200**	**$200**	**$200**	**$35,085**	**$0**
Corporate - SCADA & Other Equipment									
4.093	GPS Units - Replacement	HRM	$70					$70	$0
4.004	SCADA Control System Enhancements	HRM	$100	$100	$100	$100	$100	$500	$0
4.136	ICS Cyber Security Enhancements	HRM	$100					$100	$0
4.137	Halifax Harbour Solutions Radio Upgrade	HRM	$60					$60	$0
4.138	Wastewater Community Plants SCADA System Relocation	HRM	$45					$45	$0
4.139	PI System Enhancements	HRM	$100					$100	$0
4.154	Customer Meters - New and Replacement	HRM	$500	$415	$500	$575	$545	$2,535	$0
Corporate - SCADA & Other Equipment -- T O T A L S			**$975**	**$515**	**$600**	**$675**	**$645**	**$3,410**	**$0**
Corporate - Fleet									
4.006	Fleet Upgrade Program - Stormwater	HRM	$269	$354	$297	$327	$315	$1,562	$0
4.006	Fleet Upgrade Program - Wastewater	HRM	$1,076	$1,416	$1,188	$1,308	$1,260	$6,248	$0
4.007	Fleet Upgrade Program - Water	HRM	$610	$315	$466	$335	$445	$2,171	$0
Corporate - Fleet -- T O T A L S			**$1,955**	**$2,085**	**$1,951**	**$1,970**	**$2,020**	**$9,981**	**$0**
TOTALS - Corporate Projects			**$16,567**	**$28,745**	**$27,801**	**$10,885**	**$11,265**	**$95,263**	**$3**

HALIFAX WATER
CONSOLIDATED SUMMARY OF ESTIMATED REVENUE & EXPENSES
PROPOSED 5 YEAR BUSINESS PLAN
APRIL 1, 2020 to MARCH 31, 2025
(in thousands)

DESCRIPTION	ACTUAL APR 1/18 MAR 31/19	APPROVED BUDGET * APR 1/19 MAR 31/20	BUSINESS PLAN APR 1/20 MAR 31/21	APR 1/21 MAR 31/22	APR 1/22 MAR 31/23	APR 1/23 MAR 31/24	APR 1/24 MAR 31/25
OPERATING REVENUE	$138,413	$138,727	**$138,618**	**$138,123**	**$137,632**	**$137,145**	**$136,663**
OPERATING EXPENSES	$105,731	$115,088	**$118,110**	**$123,631**	**$128,761**	**$131,998**	**$135,962**
OPERATING SURPLUS BEFORE FINANCIAL REVENUE AND EXPENSES	$32,682	$23,639	**$20,508**	**$14,492**	**$8,871**	**$5,148**	**$700**
FINANCIAL REVENUE							
INVESTMENT INCOME	$1,156	$816	**$86**	**$86**	**$86**	**$86**	**$86**
MISCELLANEOUS	$742	$553	**$532**	**$535**	**$537**	**$539**	**$541**
	$1,898	$1,369	**$619**	**$621**	**$623**	**$625**	**$628**
FINANCIAL EXPENSES							
LONG TERM DEBT INTEREST	$7,430	$8,181	**$8,823**	**$10,124**	**$12,654**	**$15,254**	**$17,417**
LONG TERM DEBT PRINCIPAL	$20,516	$19,822	**$21,880**	**$24,203**	**$28,150**	**$32,131**	**$36,180**
AMORTIZATION DEBT DISCOUNT	$199	$202	**$228**	**$271**	**$328**	**$401**	**$439**
DIVIDEND/GRANT IN LIEU OF TAXES	$4,999	$5,147	**$6,113**	**$6,638**	**$6,705**	**$6,772**	**$6,840**
MISCELLANEOUS	$45	$22	**$32**	**$32**	**$31**	**$31**	**$31**
	$33,190	$33,374	**$37,076**	**$41,268**	**$47,868**	**$54,588**	**$60,906**
OPERATING SURPLUS (DEFICIT) AVAILABLE FOR CAPITAL EXPENDITURES	$1,390	($8,366)	**($15,949)**	**($26,156)**	**($38,374)**	**($48,815)**	**($59,578)**

** 2019/20 Operating Budget was approved by the Halifax Water Board on January 31, 2019.*
*** 2020/21 Operating Budget was approved by the Halifax Water Board on January 30, 2020.*

HALIFAX WATER
ESTIMATED REVENUE AND EXPENSES - WATER OPERATIONS
PROPOSED 5 YEAR BUSINESS PLAN
APRIL 1, 2020 to MARCH 31, 2025
(in thousands)

DESCRIPTION	ACTUAL APR 1/18 MAR 31/19	APPROVED BUDGET * APR 1/19 MAR 31/20	BUSINESS PLAN APR 1/20 MAR 31/21	APR 1/21 MAR 31/22	APR 1/22 MAR 31/23	APR 1/23 MAR 31/24	APR 1/24 MAR 31/25
OPERATING REVENUE							
METERED SALES	$48,040	$47,744	**$48,069**	**$47,904**	**$47,738**	**$47,574**	**$47,409**
FIRE PROTECTION	$7,074	$7,074	**$7,074**	**$7,074**	**$7,074**	**$7,074**	**$7,074**
PRIVATE FIRE PROTECTION SERVICES	$869	$873	**$884**	**$893**	**$903**	**$912**	**$922**
BULK WATER STATIONS	$227	$292	**$303**	**$303**	**$303**	**$303**	**$303**
CUSTOMER LATE PAY./COLLECTION FEES	$244	$223	**$238**	**$238**	**$238**	**$238**	**$238**
MISCELLANEOUS	$98	$179	**$177**	**$177**	**$177**	**$177**	**$177**
	$56,552	$56,387	**$56,746**	**$56,590**	**$56,434**	**$56,279**	**$56,125**
OPERATING EXPENSES							
WATER SUPPLY & TREATMENT (including Small Systems)	$9,747	$10,808	**$10,562**	**$10,910**	**$11,272**	**$11,647**	**$11,982**
TRANSMISSION & DISTRIBUTION	$10,014	$11,127	**$11,282**	**$12,283**	**$12,633**	**$12,994**	**$13,248**
OTTER LAKE CONTRACT	$20	$26	**$28**	**$29**	**$30**	**$31**	**$32**
TECHNICAL SERVICES (SCADA)	$889	$1,037	**$1,029**	**$1,060**	**$1,093**	**$1,127**	**$1,157**
ENGINEERING & INFORMATION SERVICES	$3,749	$3,901	**$4,162**	**$4,280**	**$4,402**	**$4,527**	**$4,618**
REGULATORY SERVICES	$679	$1,142	**$1,195**	**$1,233**	**$1,273**	**$1,313**	**$1,350**
CUSTOMER SERVICE	$2,524	$2,918	**$2,758**	**$2,839**	**$2,923**	**$3,009**	**$3,076**
ADMINISTRATION & PENSION	$3,986	$4,355	**$4,112**	**$4,230**	**$4,351**	**$4,477**	**$4,571**
DEPRECIATION	$9,046	$9,955	**$10,993**	**$11,971**	**$13,082**	**$13,488**	**$13,555**
	$40,655	$45,270	**$46,121**	**$48,837**	**$51,059**	**$52,614**	**$53,589**
OPERATING SURPLUS BEFORE FINANCIAL REVENUE AND EXPENSES	$15,898	$11,117	**$10,625**	**$7,754**	**$5,376**	**$3,665**	**$2,536**
FINANCIAL REVENUE							
INVESTMENT INCOME	$521	$367	**$39**	**$39**	**$39**	**$39**	**$39**
MISCELLANEOUS	$559	$431	**$394**	**$395**	**$397**	**$399**	**$401**
	$1,080	$798	**$432**	**$434**	**$436**	**$438**	**$440**
FINANCIAL EXPENSES							
LONG TERM DEBT INTEREST	$1,924	$2,238	**$3,127**	**$3,983**	**$5,484**	**$6,996**	**$8,027**
LONG TERM DEBT PRINCIPAL	$7,181	$5,165	**$6,465**	**$7,564**	**$9,548**	**$11,450**	**$13,138**
AMORTIZATION DEBT DISCOUNT	$85	$67	**$84**	**$108**	**$136**	**$173**	**$173**
DIVIDEND/GRANT IN LIEU OF TAXES	$4,999	$5,147	**$5,654**	**$5,710**	**$5,767**	**$5,825**	**$5,883**
MISCELLANEOUS	$24	$12	**$2**	**$2**	**$1**	**$1**	**$1**
	$14,214	$12,630	**$15,332**	**$17,368**	**$20,936**	**$24,445**	**$27,223**
OPERATING DEFICIT AVAILABLE FOR CAPITAL EXPENDITURES	$2,764	($715)	**($4,275)**	**($9,180)**	**($15,124)**	**($20,343)**	**($24,247)**

** 2019/20 Operating Budget was approved by the Halifax Water Board on January 31, 2019.*
*** 2020/21 Operating Budget was approved by the Halifax Water Board on January 30, 2020.*

HALIFAX WATER
ESTIMATED REVENUE AND EXPENSES - WASTEWATER OPERATIONS
PROPOSED 5 YEAR BUSINESS PLAN
APRIL 1, 2020 to MARCH 31, 2025
(in thousands)

DESCRIPTION	ACTUAL APR 1/18 MAR 31/19	APPROVED BUDGET * APR 1/19 MAR 31/20	BUSINESS PLAN APR 1/20 MAR 31/21	APR 1/21 MAR 31/22	APR 1/22 MAR 31/23	APR 1/23 MAR 31/24	APR 1/24 MAR 31/25
OPERATING REVENUE							
METERED SALES	$69,901	$70,031	**$70,365**	**$69,994**	**$69,625**	**$69,258**	**$68,893**
WASTEWATER OVERSTRENGTH AGREEMENTS	$75	$50	**$30**	**$30**	**$30**	**$30**	**$30**
LEACHATE	$330	$394	**$387**	**$395**	**$403**	**$411**	**$419**
CONTRACT REVENUE	$87	$86	**$86**	**$86**	**$86**	**$86**	**$86**
SEPTAGE TIPPING FEES	$764	$760	**$505**	**$530**	**$556**	**$584**	**$613**
DEWATERING FACILITY/ SLUDGE LAGOON	$210	$210	**$0**	**$0**	**$0**	**$0**	**$0**
AIRLINE EFFLUENT	$143	$160	**$105**	**$105**	**$105**	**$105**	**$105**
CUSTOMER LATE PAY./COLLECTION FEES	$186	$164	**$176**	**$176**	**$176**	**$176**	**$176**
MISCELLANEOUS	$185	$139	**$136**	**$136**	**$136**	**$136**	**$136**
	$71,881	$71,993	**$71,790**	**$71,451**	**$71,116**	**$70,785**	**$70,457**
OPERATING EXPENSES							
WASTEWATER COLLECTION	$11,676	$10,972	**$11,847**	**$12,167**	**$12,496**	**$12,835**	**$13,184**
WASTEWATER TREATMENT PLANTS (including Small Systems)	$19,459	$20,463	**$20,571**	**$21,156**	**$21,761**	**$22,385**	**$23,030**
DEWATERING FACILITY/ SLUDGE MGM'T	$226	$636	**$404**	**$421**	**$438**	**$455**	**$473**
BIOSOLIDS TREATMENT	$27	$101	**$101**	**$103**	**$105**	**$107**	**$109**
LEACHATE CONTRACT	$286	$325	**$337**	**$346**	**$355**	**$365**	**$375**
TECHNICAL SERVICES (SCADA)	$1,450	$1,784	**$1,652**	**$1,703**	**$1,755**	**$1,809**	**$1,858**
ENGINEERING & INFORMATION SERVICES	$3,783	$3,556	**$3,769**	**$3,876**	**$3,986**	**$4,099**	**$4,181**
REGULATORY SERVICES	$886	$1,434	**$1,537**	**$1,585**	**$1,636**	**$1,688**	**$1,735**
CUSTOMER SERVICE	$2,057	$2,536	**$2,352**	**$2,421**	**$2,492**	**$2,566**	**$2,623**
ADMINISTRATION & PENSION	$3,242	$3,606	**$3,405**	**$3,502**	**$3,603**	**$3,706**	**$3,784**
DEPRECIATION	$12,986	$13,921	**$15,072**	**$16,113**	**$17,195**	**$17,187**	**$18,429**
	$56,079	$59,334	**$61,045**	**$63,393**	**$65,821**	**$67,203**	**$69,780**
OPERATING SURPLUS BEFORE FINANCIAL REVENUE AND EXPENSES	$15,801	$12,659	**$10,745**	**$8,059**	**$5,295**	**$3,582**	**$677**
FINANCIAL REVENUE							
INVESTMENT INCOME	$520	$367	**$39**	**$39**	**$39**	**$39**	**$39**
MISCELLANEOUS	$183	$122	**$139**	**$139**	**$140**	**$140**	**$141**
	$703	$489	**$178**	**$178**	**$179**	**$179**	**$179**
FINANCIAL EXPENSES							
LONG TERM DEBT INTEREST	$4,939	$5,133	**$4,772**	**$4,970**	**$5,707**	**$6,202**	**$7,028**
LONG TERM DEBT PRINCIPAL	$12,015	$12,965	**$13,442**	**$14,277**	**$15,768**	**$16,984**	**$18,810**
AMORTIZATION DEBT DISCOUNT	$103	$113	**$124**	**$136**	**$158**	**$181**	**$207**
DIVIDEND/GRANT IN LIEU OF TAXES	$0	$0	**$398**	**$804**	**$812**	**$820**	**$828**
MISCELLANEOUS	$21	$10	**$30**	**$30**	**$30**	**$30**	**$30**
	$17,077	$18,220	**$18,766**	**$20,217**	**$22,474**	**$24,216**	**$26,903**
OPERATING DEFICIT AVAILABLE FOR CAPITAL EXPENDITURES	($573)	($5,072)	**($7,843)**	**($11,980)**	**($17,001)**	**($20,455)**	**($26,047)**

** 2019/20 Operating Budget was approved by the Halifax Water Board on January 31, 2019.*
*** 2020/21 Operating Budget was approved by the Halifax Water Board on January 30, 2020.*

HALIFAX WATER
ESTIMATED REVENUE AND EXPENSES - STORMWATER OPERATIONS
PROPOSED 5 YEAR BUSINESS PLAN
APRIL 1, 2020 to MARCH 31, 2025
(in thousands)

DESCRIPTION	ACTUAL APR 1/18 MAR 31/19	APPROVED BUDGET * APR 1/19 MAR 31/20	BUSINESS PLAN APR 1/20 MAR 31/21	APR 1/21 MAR 31/22	APR 1/22 MAR 31/23	APR 1/23 MAR 31/24	APR 1/24 MAR 31/25
OPERATING REVENUE							
STORMWATER SITE RELATED SERVICE	$5,906	$6,351	**$6,047**	**$6,047**	**$6,047**	**$6,047**	**$6,047**
STORMWATER RIGHT-OF-WAY SERVICE	$3,835	$3,835	**$3,835**	**$3,835**	**$3,835**	**$3,835**	**$3,835**
CUSTOMER LATE PAY./COLLECTION FEES	$118	$66	**$106**	**$106**	**$106**	**$106**	**$106**
MISCELLANEOUS	$120	$95	**$92**	**$92**	**$92**	**$92**	**$92**
	$9,980	$10,347	**$10,081**	**$10,081**	**$10,081**	**$10,081**	**$10,081**
OPERATING EXPENSES							
STORMWATER COLLECTION	$4,901	$5,750	**$5,779**	**$5,935**	**$6,095**	**$6,260**	**$6,429**
TECHNICAL SERVICES (SCADA)	$49	$39	**$42**	**$44**	**$45**	**$46**	**$48**
ENGINEERING & INFORMATION SERVICES	$624	$1,122	**$1,273**	**$1,309**	**$1,346**	**$1,384**	**$1,412**
REGULATORY SERVICES	$1,587	$1,505	**$1,627**	**$1,679**	**$1,733**	**$1,788**	**$1,838**
CUSTOMER SERVICE	$335	$273	**$304**	**$312**	**$322**	**$331**	**$339**
ADMINISTRATION & PENSION	$527	$586	**$554**	**$570**	**$586**	**$603**	**$615**
DEPRECIATION	$974	$1,208	**$1,365**	**$1,554**	**$1,755**	**$1,768**	**$1,913**
	$8,997	$10,484	**$10,943**	**$11,402**	**$11,881**	**$12,181**	**$12,594**
OPERATING SURPLUS BEFORE FINANCIAL REVENUE AND EXPENSES	$983	($137)	**($862)**	**($1,321)**	**($1,800)**	**($2,100)**	**($2,513)**
FINANCIAL REVENUE							
INVESTMENT INCOME	$116	$82	**$9**	**$9**	**$9**	**$9**	**$9**
MISCELLANEOUS	$0	$0	**$0**	**$0**	**$0**	**$0**	**$0**
	$116	$82	**$9**	**$9**	**$9**	**$9**	**$9**
FINANCIAL EXPENSES							
LONG TERM DEBT INTEREST	$567	$810	**$924**	**$1,170**	**$1,463**	**$2,057**	**$2,362**
LONG TERM DEBT PRINCIPAL	$1,320	$1,692	**$1,973**	**$2,362**	**$2,834**	**$3,697**	**$4,232**
AMORTIZATION DEBT DISCOUNT	$11	$22	**$20**	**$27**	**$34**	**$46**	**$58**
DIVIDEND/GRANT IN LIEU OF TAXES	$0	$0	**$62**	**$125**	**$126**	**$127**	**$128**
MISCELLANEOUS	$0	$0	**$0**	**$0**	**$0**	**$0**	**$0**
	$1,899	$2,524	**$2,978**	**$3,683**	**$4,457**	**$5,927**	**$6,780**
OPERATING DEFICIT AVAILABLE FOR CAPITAL EXPENDITURES	($800)	($2,579)	**($3,832)**	**($4,996)**	**($6,249)**	**($8,018)**	**($9,284)**

** 2019/20 Operating Budget was approved by the Halifax Water Board on January 31, 2019.*
*** 2020/21 Operating Budget was approved by the Halifax Water Board on January 30, 2020.*

Nova Scotia Utility and Review Board
Operations Compliance
For

Halifax Regional Water Commission

(name of utility)
for the Year Ended March 31, 20 22

We confirm, for the above-named water utility that:

1. The water utility held a valid Approval to Operate, issued by Nova Scotia Environment and Labour, for the entire period described above.

2. The water utility complied with all of the Water and Wastewater Facilities and Public Drinking Water Supplies Regulations, the Guidelines for Monitoring Public Drinking Water Supplies and their Approval to Operate, except as noted in its Annual Report to Nova Scotia Environment and Labour. A copy of these exceptions is attached hereto.

3. The water utility has complied with all of the requirements of the Nova Scotia Utility and Review Board Water Utility Accounting and Reporting Handbook unless otherwise specifically approved by the Board.

(signature) (date)

Colleen Rollings
(Chair)

Tareq Al-Zabet (Sep 21, 2023 10:45 ADT)

(signature) (date)

Tareq Al-Zabet, CEO & General Manager
(Senior Operating Officer)

NOTE: Any exceptions to the above statements should be set out on an attached sheet.

Halifax Water

Financial Statements

Halifax Regional Water Commission

March 31, 2023

Halifax Water

Contents

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Independent auditor's report

To the Members of the Board of the
Halifax Regional Water Commission

Opinion

We have audited the financial statements of the Halifax Regional Water Commission ("Halifax Water"), which comprise the statement of financial position as at March 31, 2023, and the statements of earnings and comprehensive earnings, changes in equity and cash flows for the year then ended, and notes to the financial statements, including a summary of significant accounting policies.

In our opinion, the accompanying financial statements present fairly in all material respects, the financial position of Halifax Water as at March 31, 2023, and its financial performance and its cash flows for the year then ended in accordance with International Financial Reporting Standards (IFRS).

Basis for opinion

We conducted our audit in accordance with Canadian generally accepted auditing standards. Our responsibilities under those standards are further described in the Auditor's Responsibilities for the Audit of the Financial Statements section of our report. We are independent of Halifax Water in accordance with the ethical requirements that are relevant to our audit of the financial statements in Canada, and we have fulfilled our other ethical responsibilities in accordance with these requirements. We believe that the audit evidence we have obtained is sufficient and appropriate to provide a basis for our opinion.

Other matter – supplemental schedules

Our audit was conducted for the purposes of forming an opinion on the financial statements taken as a whole as prepared in accordance with IFRS. Schedules A through E are presented in accordance with the Nova Scotia Utility and Review Board Water Utility Accounting and Reporting Handbook. Such information has been subjected to the auditing procedures applied for the purpose of the audit of the financial statements as a whole as at and for the period ended March 31, 2023.

Responsibilities of management and those charged with governance for the financial statements

Management is responsible for the preparation and fair presentation of the financial statements in accordance with IFRS, and for such internal control as management determines is necessary to enable the preparation of financial statements that are free from material misstatement, whether due to fraud or error.

In preparing the financial statements, management is responsible for assessing Halifax Water's ability to continue as a going concern, disclosing, as applicable, matters related to going concern and using the going concern basis of accounting unless management either intends to liquidate Halifax Water or to cease operations, or has no realistic alternative but to do so.

Those charged with governance are responsible for overseeing Halifax Water's financial reporting process.

Grant Thornton

Auditor's responsibilities for the audit of the financial statements

Our objectives are to obtain reasonable assurance about whether the financial statements as a whole are free from material misstatement, whether due to fraud or error, and to issue an auditor's report that includes our opinion. Reasonable assurance is a high level of assurance, but is not a guarantee that an audit conducted in accordance with Canadian generally accepted auditing standards will always detect a material misstatement when it exists. Misstatements can arise from fraud or error and are considered material if, individually or in the aggregate, they could reasonably be expected to influence the economic decisions of users taken on the basis of these financial statements.

As part of an audit in accordance with Canadian generally accepted auditing standards, we exercise professional judgment and maintain professional skepticism throughout the audit. We also:

- Identify and assess the risks of material misstatement of the financial statements, whether due to fraud or error, design and perform audit procedures responsive to those risks, and obtain audit evidence that is sufficient and appropriate to provide a basis for our opinion. The risk of not detecting a material misstatement resulting from fraud is higher than for one resulting from error, as fraud may involve collusion, forgery, intentional omissions, misrepresentations, or the override of internal control.

- Obtain an understanding of internal control relevant to the audit in order to design audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of Halifax Water's internal control.

- Evaluate the appropriateness of accounting policies used and the reasonableness of accounting estimates and related disclosures made by management.

- Conclude on the appropriateness of management's use of the going concern basis of accounting and, based on the audit evidence obtained, whether a material uncertainty exists related to events or conditions that may cast significant doubt on Halifax Water's ability to continue as a going concern. If we conclude that a material uncertainty exists, we are required to draw attention in our auditor's report to the related disclosures in the financial statements or, if such disclosures are inadequate, to modify our opinion. Our conclusions are based on the audit evidence obtained up to the date of our auditor's report. However, future events or conditions may cause Halifax Water to cease to continue as a going concern.

- Evaluate the overall presentation, structure and content of the financial statements, including the disclosures, and whether the financial statements represent the underlying transactions and events in a manner that achieves fair presentation.

We communicate with those charged with governance regarding, among other matters, the planned scope and timing of the audit and significant audit findings, including any significant deficiencies in internal control that we identify during our audit.

Grant Thornton LLP

Halifax, Canada
June 22, 2023

Chartered Professional Accountants

Halifax Regional Water Commission
Statement of financial position

March 31 (in thousands)	2023	2022
Assets		
Current		
Cash and cash equivalents	**$ 44,596**	$ 65,586
Receivables (Note 8)		
Customer charges and contractual	**17,824**	15,900
Unbilled service revenues	**19,265**	18,838
Halifax Regional Municipality	**11,287**	851
Inventory	**3,517**	2,042
Prepaids	**1,282**	2,408
	97,771	105,625
Intangible assets (Note 10)	**22,807**	20,805
Capital work in progress	**79,447**	51,013
Utility plant in service (Note 11)	**1,302,514**	1,277,393
Total assets	**1,502,539**	1,454,836
Regulatory deferral account (Note 5)	**2,236**	2,428
Total assets and regulatory deferral account	**$ 1,504,775**	$ 1,457,264
Liabilities		
Current		
Payables and accruals		
Trade	**$ 33,826**	$ 23,288
Non-trade	**4,717**	5,060
Interest on long term debt	**2,205**	2,038
Contractor and customer deposits	**2,841**	2,705
Current portion of deferred contributed capital (Note 12)	**18,836**	14,614
Current portion of long term debt (Note 13)	**45,962**	46,272
Unearned revenue	**76**	80
	108,463	94,057
Deferred contributed capital (Note 12)	**919,422**	893,975
Long term debt (Note 13)	**172,489**	177,910
Employee benefit obligations (Note 4)	**8,078**	41,950
Total liabilities	**1,208,452**	1,207,892
Equity		
Accumulated other comprehensive income	**51,651**	11,225
Accumulated surplus	**244,672**	238,147
Total equity	**296,323**	249,372
Total liabilities and equity	**$ 1,504,775**	$ 1,457,264

Contingent liabilities (Note 3)
Commitments (Note 6)

Approved by the Halifax Regional Water Commission Board

Chair

Vice Chair

See accompanying notes to the financial statements.

Halifax Regional Water Commission
Statement of earnings and comprehensive earnings

Year ended March 31 (in thousands)	2023	2022
Operating revenues		
Water	$ 49,160	$ 48,189
Wastewater	82,622	80,646
Stormwater	11,406	10,129
Public fire protection	7,744	7,628
Private fire protection	1,377	1,270
Other operating revenue	2,780	2,640
	155,089	150,502
Operating expenditures (Note 14)		
Water supply and treatment	11,646	10,760
Water transmission and distribution	11,757	11,316
Wastewater collection	13,691	12,988
Stormwater collection	4,719	4,566
Wastewater treatment	23,420	21,774
Engineering and technology services	13,677	13,719
Regulatory services	4,434	4,392
Customer services	4,447	4,811
Corporate services	3,075	3,062
Administration services	5,578	5,359
Pension services	6,851	9,229
Depreciation and amortization	51,438	49,572
	154,733	151,548
Income (loss) from operations before financial and other revenues and expenditures	356	(1,046)
Financial and other revenues		
Interest	429	178
Amortization of deferred contributed capital	18,793	18,592
Other	870	837
	20,092	19,607
Financial and other expenditures		
Interest on long term debt	6,851	6,859
Amortization of debt issue costs	227	228
Dividend/grant in lieu of taxes (Note 6)	6,524	6,466
Other	129	129
	13,731	13,682
Earnings for the year before regulatory deferral account depreciation	6,717	4,879
Regulatory deferral account depreciation	(192)	(192)
Earnings for the year	6,525	4,687
Other comprehensive earnings		
Items that will not be reclassified subsequently to earnings:		
Re-measurement on defined benefit plans	40,426	40,907
Total comprehensive earnings for the year	$ 46,951	$ 45,594

See accompanying notes to the financial statements.

Halifax Regional Water Commission
Statement of changes in equity
Year ended March 31 (in thousands)

	Accumulated other comprehensive income (loss)	Accumulated surplus	Total
Balance, April 1, 2021	$ (29,682)	$ 233,460	$ 203,778
Earnings for the year	-	4,687	4,687
Other comprehensive earnings	40,907	-	40,907
Comprehensive earnings for the year	40,907	4,687	45,594
Balance, March 31, 2022	$ 11,225	$ 238,147	$ 249,372
Earnings for the year	**-**	**6,525**	**6,525**
Other comprehensive earnings	**40,426**	**-**	**40,426**
Comprehensive earnings for the year	**40,426**	**6,525**	**46,951**
Balance, March 31, 2023	**$ 51,651**	**$ 244,672**	**$ 296,323**

See accompanying notes to the financial statements.

Halifax Regional Water Commission
Statement of cash flows

Year ended March 31 (in thousands)

	2023	2022
Increase (decrease) in cash and cash equivalents		
Operating		
Comprehensive earnings for the year	**$ 46,951**	$ 45,594
Depreciation and amortization	**33,836**	32,492
Employee benefit obligation	**(33,872)**	(31,846)
Gain on disposal of utility plant in service	**-**	(219)
	46,915	46,021
Change in non-cash operating working capital items		
Receivables, customer charges and contractual	**(1,924)**	1,255
Receivables, unbilled service revenues	**(427)**	(592)
Receivable from Halifax Regional Municipality	**(10,436)**	1,860
Inventory	**(1,475)**	(39)
Prepaids	**1,126**	(838)
Payables and accruals, trade	**10,538**	10,611
Payables and accruals, non-trade	**(343)**	(1,132)
Payables and accruals, accrued interest on long term debt	**167**	(27)
Contractor and customer deposits	**136**	590
Unearned revenue	**(4)**	(25)
	(2,642)	11,663
	44,273	57,684
Financing		
Proceeds from issuance of long term debt	**15,749**	20,000
Contributed capital and interest	**29,962**	20,958
Amortization of debt issue costs	**(71)**	75
Principal repayment on Halifax Regional Municipality long term debt	**(6,500)**	(6,500)
Principal repayments on long term debt	**(14,909)**	(14,058)
	24,231	20,475
Investing		
Proceeds from sale of utility plant in service	**-**	940
Purchase of capital work in progress	**(53,832)**	(34,203)
Purchase of utility plant in service and intangible assets	**(35,662)**	(27,538)
	(89,494)	(60,801)
Net (decrease) increase in cash and cash equivalents	**(20,990)**	17,358
Cash and cash equivalents, beginning of year	**65,586**	48,228
Cash and cash equivalents, end of year	**$ 44,596**	$ 65,586

See accompanying notes to the financial statements.

1. Nature of operations

The Halifax Regional Water Commission (Halifax Water) is a public utility owned and controlled by the Halifax Regional Municipality (HRM). Halifax Water is responsible for the supply of municipal Water, Wastewater and Stormwater Services to the residents of HRM. Halifax Water's principal place of business is 450 Cowie Hill Road, Halifax, Nova Scotia. Halifax Water is exempt from income tax.

2. Summary of significant accounting policies

(a) Statement of compliance

The financial statements have been prepared in accordance with International Financial Reporting Standards (IFRS) issued by the International Accounting Standards Board (IASB). The principal accounting policies applied in the preparation of these financial statements are set out below. These policies have been consistently applied to all years presented, unless otherwise stated.

The financial statements were authorized for issue by the Board of Commissioners on June 22, 2023.

(b) Basis of measurement

Halifax Water's financial statements are prepared on the historical cost basis, except for certain financial instruments measured at fair value. The financial statements are presented in Canadian dollars and all values are rounded to the nearest thousand. The financial statements are presented in accordance with International Accounting Standards (IAS) 1: Presentation of Financial Statements.

(c) Regulation

In matters of administrative policy relating to customers, rates and other charges, capital expenditures, depreciation rates and accounting matters, Halifax Water is subject to the jurisdiction of the Nova Scotia Utility and Review Board (NSUARB). Rates and other charges charged to and collected from customers are designed to recover the cost of providing the regulated services. Halifax Water is required to prepare submissions in accordance with the Water Utility Accounting and Reporting Handbook (the NSUARB Handbook) issued by the NSUARB. There are differences in the accounting treatment of certain transactions from IFRS including the accounting of principal debt payments, employee future benefits, depreciation and amortization, gains and losses on the disposal of utility plant in service, and accumulated surplus.

Regulatory assets represent costs incurred that have been deferred as approved by the NSUARB and will be recovered through future rates collected from customers. These assets are described as the "regulatory deferral account" and are disclosed in Note 5.

(d) Utility plant in service

Utility plant in service (Note 11) is recorded at cost, being the purchase price and directly attributable cost of acquisition or construction. Losses or gains related to assets retired, demolished or sold are charged or credited to the statement of earnings.

(e) Leased assets

Halifax Water makes use of lease arrangements for office space and equipment, and assesses whether a contract is, or contains a lease at the inception of the contract. A lease conveys the right to direct the use and obtain substantially all of the economic benefits of an identified asset for a period of time in exchange for consideration.

At lease commencement date, Halifax Water assess whether the recognition of a right-of-use asset and lease liability would have a material impact on the financial statements.

2. Summary of significant accounting policies (continued)

(e) Leased assets (continued)

A right-of-use asset is initially measured at cost, which is comprised of the initial measurement of the lease liability, any initial direct costs incurred, an estimate of any costs to dismantle and remove the asset at the end of the lease, and any lease payments made in advance of the lease commencement date (net of any incentives received). A right-of-use asset is subsequently measured at cost less any accumulated depreciation or impairment losses and adjusted for certain re-measurements of the lease liability. A lease liability is initially measured at the present value of the lease payments that are not paid at the commencement date, discounted using the interest rate implicit in the lease or, if that rate cannot be readily determined, Halifax Water's incremental borrowing rate.

Halifax Water has elected to apply the practical expedients available under IFRS 16 for short-term leases and leases for which the underlying asset is of low value. Short-term leases and low value leases are expensed in the period incurred.

Halifax Water maintains very few lease arrangements and management will assess future leases as they arise to determine whether the impact of the recognition of a right-of-use asset and lease liability on the statements of financial position, where Halifax Water is acting as a lessee, is material to the financial statements. All existing leases have been assessed and recognition in the financial statements has been deemed immaterial.

(f) Deferred contributed capital

Contributions towards capital projects are treated as deferred contributed capital on the statement of financial position and amortized over the estimated useful lives of the assets (Note 12). Deferred contributed capital is initially measured at cost, being the value of contributions received by Halifax Water for the acquisition of utility plant in service. Contributions for capital expenditures are amortized over the estimated useful lives of the assets and show as a reduction in the amortization of utility plant in service.

(g) Cash and cash equivalents

Cash and cash equivalents consist of cash on hand and cash balances managed by HRM that are held within financial institutions.

(h) Depreciation of utility plant in service

Depreciation is calculated using the straight-line method over the estimated useful lives of the assets.

The estimated useful lives for the major classifications of utility plant in service are as follows:

Office equipment and furniture and transportation equipment	3 to 10 years
Supervisory control and data acquisition (SCADA) equipment	5 to 25 years
Meters	20 to 25 years
Pumping equipment	5 to 30 years
Tools and work equipment	5 to 30 years
Culverts	25 to 50 years
Purification and treatment equipment	20 to 50 years
Services and laterals	50 to 60 years
Hydrants	50 to 80 years
Structures and improvements	50 to 100 years
Water, Wastewater and Stormwater mains	50 to 100 years

2. Summary of significant accounting policies (continued)

(h) Depreciation of utility plant in service (continued)

Depreciation commences in the year an asset is placed into service and ready for its intended use. In the year of acquisition, depreciation is calculated at 50% of the above rates unless a project is significant, in which case depreciation is prorated for the number of months the asset was in use. Halifax Water does not maintain a depreciation fund per regulatory reporting requirements. Halifax Water has received NSUARB approval for exemption from establishing a depreciation fund as long as net depreciable additions to utility plant in service exceed the depreciation expense included within the rates.

(i) Inventory

Inventory is comprised of direct materials and supplies. Inventory is valued at the lower of cost and net realizable value with cost being determined on the weighted average cost method.

(j) Revenues and expenditures

Halifax Water recognizes revenue in a manner that depicts the transfer of goods or services to customers at an amount that reflects the consideration Halifax Water is entitled to in exchange for those goods or services rendered.

All revenues and expenditures are recorded on an accrual basis. Revenues relating to supplying Water, Wastewater and Stormwater Services are recorded based on cyclical billings and include an accrual for estimated amounts not yet billed. Fire protection revenue is recorded based on approved rates. Other revenues are recorded at the time services are performed, the amount can be measured reliably, and collection is reasonably assured.

(k) Long term debt

Debt issue costs are deferred and amortized over the term of the debt to which they relate.

(l) Use of estimates and critical accounting judgments

In preparing Halifax Water's financial statements, management is required to make estimates and assumptions that affect the reported amounts of assets and liabilities, the disclosure of contingent assets and liabilities at the date of the financial statements and reported amounts of revenue and expenditures during the period. Significant estimates and assumptions include the following:

- At year end, unbilled service revenues from Water, Wastewater and Stormwater Services have been earned, but not yet billed due to the timing of the billing cycles. Management estimates the unbilled service revenues accrual based on historic billing trends.
- Management assumptions are used in the actuarial determination of employee benefit obligations, such as standard rates of inflation, mortality, discount rates, and anticipation of future salary increases.
- Useful lives of utility plant in service are reviewed based on expected patterns of usage and historical information.
- Recognition and measurement of provisions and contingencies.

Actual results could differ from these estimates.

(m) Financial instruments

Recognition and derecognition
Financial assets and financial liabilities are recognized when Halifax Water becomes a party to the contractual provisions of the financial instrument. Financial assets are derecognized when the contractual rights to the cash flows from the financial asset expire, or when the financial asset and substantially all the risks and rewards are transferred. A financial liability is derecognized when it is extinguished, discharged, cancelled or expired.

2. Summary of significant accounting policies (continued)

(m) Financial instruments (continued)

Classification and initial measurement of financial instruments
All financial instruments are initially measured at fair value and adjusted for transaction costs, where applicable. Financial instruments are classified as: those measured at amortized cost, fair value through other comprehensive income (assets only), or fair value through profit and loss (FVTPL).

Halifax Water has classified its financial instruments as follows:

Asset/Liability	Classification
Cash and cash equivalents	Amortized cost
Receivables	Amortized cost
Payables and accruals	Amortized cost
Long term debt	Amortized cost
Contractor and customer deposits	Amortized cost

The classification is determined by both the Halifax Water business model for managing the financial instrument and the contractual cash flow characteristics of the financial instrument.

Subsequent measurement of financial assets
Financial assets are measured subsequently at amortized cost if the assets meet the following conditions, and are not designated as FVTPL:

- they are held within a business model whose objective is to hold the financial assets and collect its contractual cash flows; and
- the contractual terms of the financial assets give rise to cash flows that are solely payments of principal and interest on the principal amount outstanding.

After initial recognition, financial instruments are measured at amortized cost using the effective interest method. Discounting is omitted where the effect of discounting is immaterial.

Impairment of financial assets
Impairment requirements use more forward-looking information to recognize expected credit losses, the expected credit loss (ECL) model. Financial assets that are subject to the ECL model include cash and cash equivalents and receivables.

Subsequent measurement of financial liabilities
Financial liabilities are subsequently measured at amortized cost using the effective interest method. All interest charges are included in interest costs or revenues within the statement of earnings and comprehensive earnings.

(n) Provisions

A provision is recognized in the statement of financial position when Halifax Water has a legal or constructive obligation as a result of a past event, and it is probable that an outflow of economic benefits will be required to settle the obligation. If the effect is material, provisions are determined by discounting the expected future cash flows at a rate that reflects current market assessment of the time value of money and, where appropriate, the risks specific to the obligation.

(o) Impairments

At the end of each reporting period, Halifax Water reviews the carrying amounts of its tangible and intangible assets to determine whether there is an indication of an impairment loss. If any such indication exists, the recoverable amount of the assets is estimated in order to determine the extent of impairment loss, if any. The recoverable amount of any asset is the higher of its fair value less costs to sell and its value in use.

2. Summary of significant accounting policies (continued)

(o) Impairments (continued)

Where it is not possible to estimate the recoverable amount of an individual asset, the impairment test is carried out on the asset's cash-generating unit (CGU), which is the lowest group of assets to which the asset belongs for which there are separately identifiable cash inflows that are largely independent of the cash inflows from other assets. Halifax Water has three CGU's (Water, Wastewater and Stormwater) for which impairment testing is performed.

If the recoverable amount of the asset is estimated to be less than its carrying amount, the carrying amount of the asset is reduced to its recoverable amount. An impairment loss is recognized immediately in earnings. When an impairment loss is subsequently reversed, the carrying amount of the assets is increased to the revised estimate of its recoverable amount, but so that the increased carrying amount does not exceed the carrying amount that would have been determined had no impairment loss been recognized for the asset in prior years.

(p) Intangible assets

Intangible assets include land rights, water removal rights, studies, and capital master plans. These are recorded at cost less accumulated amortization. Land rights include payment for easements and right of use over land and have an indefinite useful life. Intangibles with finite useful lives are amortized annually over the estimated useful lives. The expected useful lives are as follows:

Intangible assets	10 to 30 years

(q) Employee benefit obligations

Halifax Water accrues annually, the estimated liabilities for pension and other employee benefits.

Pension benefits
Halifax Water provides employment, post-retirement and pre-retirement benefits through defined benefit plans and supplemental retirement plans.

The cost of pension benefits for the supplemental retirement plans are expensed at the time active employees are compensated.

The defined benefit plan sponsored by Halifax Water determines the amount of pension benefits employees will receive on retirement by reference to length of service and salary levels. Obligations associated with the defined benefit plan reside with Halifax Water, even if plan assets for funding the plan are set aside.

The liability recognized in the statement of financial position for the defined benefit plan sponsored by Halifax Water is the present value of the defined benefit obligation at the end of the reporting date less the fair value of plan assets.

Management estimates the defined benefit obligation annually with assistance from an independent actuary using the projected unit credit method. The defined benefit obligation uses estimates for inflation, medical cost trends, mortality, and anticipated salary levels. The discount factor used to present value estimated future cash flows is determined with reference to high quality corporate bonds that have terms to maturity approximating the terms of the related pension liability.

Gains and losses resulting from re-measurements of the net defined benefit liability are charged to other comprehensive income in the period in which they arise. Service costs are recognized immediately into earnings.

Net interest cost related to pension obligations and returns on plan assets are included in salary and benefits on the statement of earnings.

2. Summary of significant accounting policies (continued)

(q) Employee benefit obligations (continued)

Halifax Water is responsible for funding the employer share of contributions to the HRM pension plan for certain employees that transferred from HRM as of August 1, 2007. HRM administers this defined benefit pension plan and Halifax Water reimburses HRM for the pension costs related to Halifax Water's proportionate share of the employees covered under the plan. Due to the nature of the plan, Halifax Water does not have sufficient information to account for the plan as a defined benefit pension plan; therefore, the multi-employer defined benefit plan is accounted for in the same manner as the supplemental retirement plans. An expense is recorded in the period when Halifax Water is obligated to make contributions for services rendered by the employee.

Short-term employee benefits
Short-term employee benefit obligations that are due to be settled wholly within twelve months after the end of the annual reporting period in which the employees rendered the related service are measured on an undiscounted basis and are expensed as the related service is provided.

(r) Regulatory deferral account

The regulatory deferral account is recognized and measured at historical cost less depreciation. Management continually assesses the likelihood of recovery of regulatory assets. If recovery through future rates is no longer considered probable, the amounts would be charged to the results of operations in the period that the assessment is made.

3. Contingent liabilities

As a condition of sale in 2004 of a property, Halifax Water indemnified the purchaser from claims or actions resulting from migration of halocarbons. The environmental risk is assessed to be low and the likelihood of any related liability is not determinable.

Halifax Water has reviewed environmental risk factors at other owned properties to determine whether there is an obligation for reclamation. As of the date of issue of the financial statements the likelihood of any related liability is not determinable.

There are active claims against Halifax Water; however, the likelihood of actual liability is not determinable at this time. If Halifax Water's defence of active claims is unsuccessful, the potential exposure would be $1,000 - $2,000.

4. Employee benefit obligations

Retirement benefit plan – employees transferred from HRM
For employees that transferred from HRM, Halifax Water records an expense for the employer's share of the contributions to the Halifax Regional Municipality Pension Plan (HRM Pension Plan) in the period when Halifax Water is obligated to make contributions for services rendered by the employee. During 2023, Halifax Water funded $458 (2022 - $532) in contributions to the HRM Pension Plan. The number of employees included in this plan is 48 (2022 - 53) and this number is reducing over time. As former HRM employees retire, they are replaced with employees in the Halifax Regional Water Commission Employee Pension Plan (the Plan).

Supplemental retirement plans sponsored by Halifax Water
For employees who participate in the supplemental retirement plans, the cost of pension benefits are expensed at the time active employees are compensated. During 2023, Halifax Water funded $28 (2022 - $23) in contributions to these plans. The number of employees included in these plans is 6 (2022 - 6).

4. Employee benefit obligations (continued)

Defined benefit plan sponsored by Halifax Water and other long term employment benefits
For all other employees, Halifax Water maintains a defined benefit pension plan and offers post-retirement health and insurance benefits. The defined benefit pension plan provides pensions based upon length of service and best seven consecutive years' earnings. The defined benefit pension plan is funded by employer and employee contributions with employees contributing 9.60% (10.34% to December 31, 2021) of pensionable employee earnings and Halifax Water matching employee contributions. The defined benefit pension plan assets are managed by the HRM Pension Committee.

Employees, who retired prior to July 1, 1998, have extended health benefits coverage for life and drug coverage until age 65. Employees, who retired after July 1, 1998 and before December 31, 2008, have coverage for drug, extended health, dental and life insurance until age 65 on a 50/50 cost shared basis and a 100% basis for employees who retired after December 31, 2008. Extended health coverage for these retirees and their spouses after the age of 65 is available on an optional basis at 100% retiree cost and drug coverage is available through the provincially managed drug program.

Halifax Water has a non-funded pre-retirement benefit that is accrued annually, and is payable on retirement, termination or death of the employee. For individuals who elected to defer receipt of their benefit until the time which they leave employment, their individual benefit equates to approximately three days' pay for each year of completed service. Completed service for unionized employees was frozen as at June 7, 2019, and June 20, 2019 for non-union employees, for the purposes of determining their pre-retirement benefit. Pre-retirement benefits accrue to a maximum of six months' salary and can be taken as a lump sum payment at the time of retirement in lieu of pre-retirement leave.

Information about Halifax Water's plans, based on an actuarial extrapolation of the defined benefit pension plan, and an actuarial valuation of the pre-retirement benefits and the post-retirement benefits as at March 31, 2023, is as follows:

	Defined benefit pension plan		Post-retirement benefits		Pre-retirement benefits		Total	
	2023	2022	**2023**	2022	**2023**	2022	**2023**	2022
Change in accrued benefit obligation								
Balance, April 1	**$ 208,627**	$ 227,572	**$ 310**	$ 395	**$ 1,637**	$ 1,718	**$ 210,574**	$ 229,685
Current service cost	**11,628**	13,648	**-**	-	**89**	100	**11,717**	13,748
Interest cost	**8,450**	7,877	**10**	10	**62**	52	**8,522**	7,939
Benefit payments	**(6,407)**	(5,433)	**(45)**	(53)	**(273)**	(92)	**(6,725)**	(5,578)
Re-measurements – actuarial (gains)/ losses from changes in financial/experience assumptions	**(35,551)**	(35,037)	**15**	(42)	**(158)**	(141)	**(35,694)**	(35,220)
Balance, March 31	**186,747**	208,627	**290**	310	**1,357**	1,637	**188,394**	210,574
Change in fair value of plan assets								
Balance, April 1	**168,624**	155,889	**-**	-	**-**	-	**168,624**	155,889
Investment income	**6,746**	5,326	**-**	-	**-**	-	**6,746**	5,326
Administrative expenses	**(149)**	(80)	**-**	-	**-**	-	**(149)**	(80)
Actual return on plan assets	**4,872**	5,869	**-**	-	**-**	-	**4,872**	5,869
Benefit payments	**(6,407)**	(5,433)	**(45)**	(53)	**(273)**	(92)	**(6,725)**	(5,578)
Contributions: Employee	**3,377**	3,581	-	-	**-**	-	**3,377**	3,581
Employer	**3,253**	3,472	**45**	53	**273**	92	**3,571**	3,617
Balance, March 31	**180,316**	168,624	**-**	-	**-**	-	**180,316**	168,624
Accrued benefit liability, March 31	**$ 6,431**	$ 40,003	**$ 290**	$ 310	**$ 1,357**	$ 1,637	**$ 8,078**	$ 41,950

4. Employee benefit obligations (continued)

Included in the statement of earnings and comprehensive earnings is pension expense of $10,628 (2022 - $13,066).

The significant actuarial assumptions adopted in measuring Halifax Water's accrued benefit obligations are as follows:

	2023 Defined benefit pension plan	2022 Defined benefit Pension plan	**2023 Post-retirement benefits**	2022 Post-retirement benefits	**2023 Pre-retirement benefit**	2022 Pre-retirement benefit
Discount rate	4.90%	4.00%	4.75%	3.7%	4.90%	3.90%
Expected return on plan assets	4.90%	4.00%	N/A	N/A	N/A	N/A
Rate of compensation increase	3.75%	3.75%	N/A	N/A	3.75%	3.75%
Expenses for life benefits as a % of claims	N/A	N/A	9.36%	9.36%	N/A	N/A
Health benefit trending per year	N/A	N/A	6.06%	6.18%	N/A	N/A
Dental benefit trending per year	N/A	N/A	4.00%	4.00%	N/A	N/A

The measurement date used to determine the plan assets and the accrued benefit obligation was March 31, 2023. The most recent actuarial valuation for the defined benefit pension plan was January 1, 2022, with the next actuarial valuation scheduled for January 1, 2025. Going concern extrapolations of the defined benefit penion plan occur annually between the actuarial valuation dates.

The estimated employer contributions expected to be paid to the pension plans for the next fiscal year are $3,916.

5. Regulatory deferral account

In 2011, the NSUARB granted Halifax Water approval to defer depreciation charges on certain assets transferred in 2010 from HRM relating to the Halifax Harbour Solutions Project (HHSP). Depreciation of $2,078 was deferred in each of fiscal 2011 and 2012. As a result, Halifax Water recognized a $4,156 regulatory deferral account. In absence of rate regulation, this regulatory deferral account would have been expensed as depreciation in fiscal 2011 and 2012. In 2012, the NSUARB granted approval of the depreciation of this deferral account over the remaining useful lives of the underlying assets, beginning in 2014. The expense recognized in 2023 is $192 (2022 - $192).

	2023	2022
Balance, April 1	**$ 2,428**	$ 2,620
Depreciation	**(192)**	(192)
Balance, March 31	**$ 2,236**	$ 2,428

6. Commitments

The three-year agreement with HRM for the dividend/grant in lieu of taxes (dividend) expired on March 31, 2023 and a new agreement for a five-year period from April 1, 2023 through March 31, 2028 has been approved by the NSUARB. Dividend payments are approved as part of revenue requirements by the NSUARB. The total amount payable will be calculated based on Property Valuation Services Corporation's (PVSC) assessed value of Halifax Water properties and the property tax rates set by HRM each fiscal year. To phase in this new approach to calculating the payment, the assessed value of Halifax Water properties will be reduced by a declining percentage over the five-year period. In addition, the agreement states that the amount payable by Halifax Water to HRM in the fiscal year ending March 31, 2024 shall not exceed $6,589. The payment will be allocated to each service based on no more then 1.56% times the water rate base, at least 0.25% times the wastewater rate base, and at least 0.25% times the stormwater rate base. In the event these allocations are not sufficient to fund the payment in any given fiscal year, the allocations for wastewater and stormwater will be increased to an amount sufficient to fund the payment.

7. Capital management

Halifax Water's objective when managing capital is to ensure sufficient liquidity to support its financial obligations and execute its operating and capital plans. Halifax Water monitors and adjusts its capital structure through additional borrowings of long term debt which are used to finance capital projects.

Halifax Water considers its total capitalization to include all long term debt and total equity. The calculation is set out as follows:

	2023	2022
Long term debt	$ 218,451	$ 224,182
Equity	296,323	249,372
Capital under management	$ 514,774	$ 473,554

Halifax Water has obtained regulatory approval for all borrowings during the fiscal year. Halifax Water is not subject to financial borrowing covenants other than as outlined in Note 9.

8. Financial instruments and risk management

Halifax Water applies a three-tier hierarchy framework for disclosing fair value of financial instruments, based on whether the inputs into the various valuation techniques are observable or unobservable. Observable techniques reflect market data obtained from independent sources, while unobservable inputs reflect management assumptions. Changes in valuation techniques of financial instruments may result in transfers of assigned levels. The hierarchy of input is as follows:

Level I	Quoted prices in active markets for identical assets or liabilities;
Level II	Inputs other than quoted prices included in Level I that are observable, either directly or indirectly; and
Level III	Inputs that are not based on observable market data.

The carrying values of current assets and current liabilities approximate their fair value due to the relatively short period to maturity of these financial instruments. The fair value of fixed rate long-term debt is assumed to approximate its carrying value given the limitations where Halifax Water can obtain long-term debt.

There were no transfers between classes of the fair value hierarchy during the year.

Halifax Water is exposed to risks as a result of holding financial instruments. Management considers and evaluates those risks on an on-going basis to ensure that the risks are appropriately managed. These potential risks include credit risk, interest risk, market risk and liquidity risk.

Credit risk
Credit risk arises from the possibility that Halifax Water's customers may experience financial difficulty and be unable to fulfill their obligations. Halifax Water's maximum exposure to credit risk corresponds to customer charges and contractual receivables. However, Halifax Water's customers are numerous and diverse, which reduces the concentration of credit risk.

Halifax Water makes use of a simplified approach in accounting for receivables and records the loss allowance as lifetime ECL. These are the expected shortfalls in contractual cash flows, considering the potential for default at any point during the life of the financial instrument. In calculating, Halifax Water uses its historical experience, external indicators and forward-looking information to calculate the ECL using a provision matrix. Halifax Water includes 75% of the balance of closed accounts in the allowance and 1% of active accounts. Halifax Water assesses impairment of receivables on a collective basis. As receivables possess shared credit risk characteristics, receivables have been grouped based on the days past due.

8. Financial instruments and risk management (continued)

An analysis of Halifax Water's receivables and continuity of Halifax Water's provision for impairment losses on receivables is as follows:

	2023	2022
Receivables		
Customer charges, contractual, and unbilled service revenues	**$ 40,141**	$ 37,969
Less: allowance for doubtful accounts	**(3,052)**	(3,231)
	$ 37,089	$ 34,738

The credit quality of financial assets that are neither past due nor impaired are assessed with reference to historical information and includes the following considerations; new customers, existing customers and payment pattern history.

Interest risk
Interest risk arises from the possibility that changes in interest rates will cause fluctuations in expenses and/or cash flows associated with Halifax Water's long term debt. Halifax Water's long term debt has been acquired with a variety of fixed rates and has staggered maturity dates which mitigates the interest rate risk.

Market risk
Market risk arises from the possibility that the value of an investment will fluctuate as a result of changes in market prices. These changes could affect the market value of the investments in Halifax Water's Plan and consequently the Plan's surplus. The risk is mitigated by the Plan diversifying the types of investments in its portfolio.

Liquidity risk
Liquidity risk arises from the possibility of Halifax Water not being able to meet its cash requirements in a timely and cost-effective manner. Halifax Water manages this risk by closely monitoring the cash on hand in comparison to upcoming cash commitments.

9. Related party transactions

The immediate parent and ultimate controlling party of Halifax Water is HRM.

Halifax Water is obligated to make payments on debt, held in the name of HRM, associated with Wastewater and Stormwater assets which were transferred to Halifax Water in 2007 and subsequent years.

Amounts receivable from HRM have normal credit terms.

Halifax Water had the following related party transactions with HRM:

	2023	2022
Revenue for provision of Water, Wastewater and Stormwater Services	**$ 6,029**	$ 4,987
Public fire protection revenue	**7,744**	7,628
Dividend	**(6,524)**	(6,466)
Operating expenditures	**(1,015)**	(1,537)
Net revenue and expenditures	**$ 6,234**	$ 4,612

The debt issued by Halifax Water was covered by a blanket guarantee from HRM subject to Halifax Water maintaining a debt service ratio of less than 35%. The debt service ratio at March 31, 2023 is 18.94% (2022 - 18.98%).

9. Related party transactions (continued)

Compensation of key management personnel

Members of the Board of Commissioners and Executive Management team are deemed to be key management personnel. It is the Board of Commissioners and Executive Management team who have the responsibility for planning, directing and controlling the activities of Halifax Water.

The following is compensation expense for key management personnel:

	2023	2022
Regular compensation and benefits	$ 1,364	$ 1,370
Post-employment benefits	123	132
Total compensation	$ 1,487	$ 1,502

10. Intangible assets

	2023	2022
Cost		
Balance, April 1	$ 31,967	$ 29,498
Additions	4,456	2,469
Balance, March 31	36,423	31,967
Accumulated amortization		
Balance, April 1	11,162	8,910
Amortization	2,454	2,252
Balance, March 31	13,616	11,162
Net book value, March 31	$ 22,807	$ 20,805

11. Utility plant in service

	Land	Structures and improvements	Treatment and network equipment	Distribution and collection network	Tools and work equipment	**Total**
Cost						
Balance, April 1, 2022	$ 25,771	$ 272,587	$ 282,749	$ 990,615	$ 35,554	**$ 1,607,276**
Additions	-	12,243	10,120	46,434	6,307	**75,104**
Disposals	-	-	-	-	-	**-**
Balance, March 31, 2023	25,771	284,830	292,869	1,037,049	41,861	**1,682,380**
Accumulated depreciation						
Balance, April 1, 2022	$ -	$ 81,781	$ 102,153	$ 130,694	$ 15,255	**$ 329,883**
Depreciation	-	9,084	16,031	18,763	6,105	**49,983**
Depreciation retired	-	-	-	-	-	**-**
Balance, March 31, 2023	-	90,865	118,184	149,457	21,360	**379,866**
Net book value, March 31, 2023	$ 25,771	$ 193,965	$ 174,685	$ 887,592	$ 20,501	**$ 1,302,514**

	Land	Structures and improvements	Treatment and network equipment	Distribution and collection network	Tools and work equipment	Total
Cost						
Balance, April 1, 2021	$ 25,989	$ 268,188	$ 276,444	$ 958,640	$ 33,492	$ 1,562,753
Additions	-	4,731	6,523	32,137	3,047	46,438
Disposals	(218)	(332)	(218)	(162)	(985)	(1,915)
Balance, March 31, 2022	25,771	272,587	282,749	990,615	35,554	1,607,276
Accumulated depreciation						
Balance, April 1, 2021	$ -	$ 72,724	$ 86,766	$ 112,483	$ 10,464	$ 282,437
Depreciation	-	9,111	15,536	18,222	5,771	48,640
Depreciation retired	-	(54)	(149)	(11)	(980)	(1,194)
Balance, March 31, 2022	-	81,781	102,153	130,694	15,255	329,883
Net book value, March 31, 2022	$ 25,771	$ 190,806	$ 180,596	$ 859,921	$ 20,299	$ 1,277,393

12. Deferred contributed capital

	2023	2022
Balance, April 1	**$ 908,589**	$ 898,952
Assets contributed during the year	**18,500**	7,271
Contributions and interest	**29,962**	20,958
Amortization	**(18,793)**	(18,592)
Balance, March 31	**938,258**	908,589
Less: current portion	**(18,836)**	(14,614)
	$ 919,422	$ 893,975

Deferred contributed capital is comprised of contributions received by Halifax Water for the acquisition of utility plant in service. Contributions for capital expenditures are amortized over the estimated useful lives of the assets.

13. Long-term debt

	Interest rates	2023	2022
Payable to Municipal Finance Corporation (MFC)			
Water	0.400% to 4.221%	**$ 86,712**	$ 79,286
HHSP	2.015% to 2.561%	**4,550**	5,200
Wastewater	0.400% to 4.116%	**89,859**	96,915
Stormwater	0.400% to 3.782%	**25,252**	24,132
		206,373	205,533
Payable to Halifax Regional Municipality			
Wastewater/Stormwater	1.200% to 5.940%	**13,000**	19,500
		219,373	225,033
Less: debt issue costs		**(922)**	(851)
		218,451	224,182
Less: amount payable within one year		**(45,962)**	(46,272)
		$ 172,489	$ 177,910

During the year Halifax Water acquired $15,749 in new debt with a ten year term and thirty year amortization period.

The debentures are repayable in fixed annual principal instalments plus interest payable semi-annually. Interest paid during the year was $6,851 (2022 - $6,859). Principal instalments for the next five years are as follows:

2023/24	$ 45,962
2024/25	$ 36,076
2025/26	$ 26,428
2026/27	$ 13,010
2027/28	$ 13,931
Thereafter	$ 83,966

14. Operating expenditures by nature

	2023	2022
Salaries and benefits	$ 42,473	$ 43,817
Pension	6,851	9,229
Training	681	432
Contract services	15,791	13,938
Electricity	7,090	7,160
Operating supplies	15,351	13,081
Professional services	5,351	5,953
Chemicals	8,708	7,046
Depreciation on assets allocated to departments	999	1,320
Depreciation and amortization	51,438	49,572
	$ 154,733	$ 151,548

15. Comparative figures

Certain of the comparative figures have been reclassified to conform to the financial statement presentation adopted for the current fiscal year.

Halifax Regional Water Commission
Schedule of utility plant in service
Year ended March 31, 2023 (in thousands)

Schedule A

Water

	Land	Structures and improvements	Pumping equipment	Purification equipment	SCADA equipment	Transmission and distribution mains	Services	Meters	Hydrants	Aerotech and small systems	Tools and work equipment	Total
Cost												
Balance, April 1, 2022												
Cost	$ 18,215	$ 122,825	$ 10,778	$ 29,411	$ 11,293	$ 418,465	$ 45,052	$ 19,234	$ 22,447	$ 10,048	$ 35,131	**$ 742,899**
Additions	-	9,012	-	2,695	892	15,831	3,967	138	853	-	4,739	**38,127**
Disposals	-	-	-	-	-	-	-	-	-	-	-	**-**
Balance, March 31, 2023	18,215	131,837	10,778	32,106	12,185	434,296	49,019	19,372	23,300	10,048	39,870	**781,026**
Accumulated depreciation												
Balance, April 1, 2022	-	35,665	8,468	21,069	5,375	105,279	9,850	6,717	5,581	4,296	19,490	**221,790**
Depreciation	-	2,235	303	1,379	544	5,398	828	904	377	330	3,713	**16,011**
Depreciation retired	-	-	-	-	-	-	-	-	-	-	-	**-**
Total accumulated depreciation, March 31, 2023	-	37,900	8,771	22,448	5,919	110,677	10,678	7,621	5,958	4,626	23,203	**237,801**
Net book value, March 31, 2023	$ 18,215	$ 93,937	$ 2,007	$ 9,658	$ 6,266	$ 323,619	$ 38,341	$ 11,751	$ 17,342	$ 5,422	$ 16,667	**$ 543,225**

	Land	Structures and improvements	Pumping equipment	Purification equipment	SCADA equipment	Transmission and distribution mains	Services	Meters	Hydrants	Aerotech and small systems	Tools and work equipment	Total
Cost												
Balance, April 1, 2021												
Cost	$ 18,433	$ 121,564	$ 10,745	$ 28,232	$ 11,371	$ 411,533	$ 43,158	$ 19,147	$ 21,990	$ 10,048	$ 32,162	**$ 728,383**
Additions	-	1,593	33	1,179	19	7,086	1,894	208	457	-	3,514	**15,983**
Disposals	(218)	(332)	-	-	(97)	(154)	-	(121)	-	-	(545)	**(1,467)**
Balance, March 31, 2022	18,215	122,825	10,778	29,411	11,293	418,465	45,052	19,234	22,447	10,048	35,131	**742,899**
Accumulated depreciation												
Balance, April 1, 2021	-	33,572	8,167	19,863	4,931	100,002	9,081	5,874	5,216	3,963	16,695	**207,364**
Depreciation	-	2,125	301	1,206	536	5,287	769	900	365	333	3,340	**15,162**
Depreciation retired	-	(32)	-	-	(92)	(10)	-	(57)	-	-	(545)	**(736)**
Total accumulated depreciation, March 31, 2022	-	35,665	8,468	21,069	5,375	105,279	9,850	6,717	5,581	4,296	19,490	**221,790**
Net book value, March 31, 2022	$ 18,215	$ 87,160	$ 2,310	$ 8,342	$ 5,918	$ 313,186	$ 35,202	$ 12,517	$ 16,866	$ 5,752	$ 15,641	**$ 521,109**

Schedule A is presented in accordance with the NSUARB Water Utility Accounting and Reporting Handbook (NSUARB Handbook).

Utility plant in service under IFRS differs from the NSUARB Handbook due to exclusion of intangible assets, componentization of certain assets and differences in useful lives for depreciation.

Halifax Regional Water Commission
Schedule of utility plant in service
Year ended March 31, 2023 (in thousands)

Schedule A

Wastewater

	Land	Structures and improvements	Pumping equipment	Treatment equipment	SCADA equipment	Collection system	Laterals	Meters	Aerotech and small systems	Tools and work equipment	Total
Cost											
Balance, April 1, 2022											
Cost	$ 7,083	$ 199,497	$ 26,142	$ 178,188	$ 15,954	$ 349,151	$ 32,279	$ 8,971	$ 12,784	$ 46,900	**$ 876,949**
Additions	-	3,445	3,009	2,311	86	6,511	4,928	138	-	5,423	**25,851**
Disposals	-	-	-	-	-	-	-	-	-	-	**-**
Balance, March 31, 2023	7,083	202,942	29,151	180,499	16,040	355,662	37,207	9,109	12,784	52,323	**902,800**
Accumulated depreciation											
Balance, April 1, 2022	-	73,004	10,834	90,122	5,146	80,026	4,227	1,407	5,209	24,127	**294,102**
Depreciation	-	4,341	1,159	9,247	903	4,901	705	450	391	4,106	**26,203**
Depreciation retired	-	-	-	-	-	-	-	-	-	-	**-**
Total accumulated depreciation, March 31, 2023	-	77,345	11,993	99,369	6,049	84,927	4,932	1,857	5,600	28,233	**320,305**
Net book value, March 31, 2023	$ 7,083	$ 125,597	$ 17,158	$ 81,130	$ 9,991	$ 270,735	$ 32,275	$ 7,252	$ 7,184	$ 24,090	**$ 582,495**

	Land	Structures and improvements	Pumping equipment	Treatment equipment	SCADA equipment	Collection system	Laterals	Meters	Aerotech and small systems	Tools and work equipment	Total
Cost											
Balance, April 1, 2021											
Cost	$ 7,083	$ 196,408	$ 23,273	$ 176,639	$ 15,954	$ 336,514	$ 31,433	$ 8,763	$ 12,784	$ 45,649	**$ 854,500**
Additions	-	3,089	2,869	1,549	-	12,637	846	208	-	1,691	**22,889**
Disposals	-	-	-	-	-	-	-	-	-	(440)	**(440)**
Balance, March 31, 2022	7,083	199,497	26,142	178,188	15,954	349,151	32,279	8,971	12,784	46,900	**876,949**
Accumulated depreciation											
Balance, April 1, 2021	-	68,574	9,814	81,043	4,222	75,282	3,581	963	4,815	20,604	**268,898**
Depreciation	-	4,430	1,020	9,079	924	4,744	646	444	394	3,958	**25,639**
Depreciation retired	-	-	-	-	-	-	-	-	-	(435)	**(435)**
Total accumulated depreciation, March 31, 2022	-	73,004	10,834	90,122	5,146	80,026	4,227	1,407	5,209	24,127	**294,102**
Net book value, March 31, 2022	$ 7,083	$ 126,493	$ 15,308	$ 88,066	$ 10,808	$ 269,125	$ 28,052	$ 7,564	$ 7,575	$ 22,773	**$ 582,847**

Schedule A is presented in accordance with the NSUARB Handbook.

Utility plant in service under IFRS differs from the NSUARB Handbook due to exclusion of intangible assets, componentization of certain assets and differences in useful lives for depreciation.

Halifax Regional Water Commission
Schedule of utility plant in service
Year ended March 31, 2023 (in thousands)

Schedule A

Stormwater

	Land	Structures and improvements	Collection system	Laterals	Aerotech and small systems	**Total**
Cost						
Balance, April 1, 2022						
Cost	$ 473	$ 12,732	$ 279,900	$ 5,525	$ 6,388	**$ 305,018**
Additions	-	-	15,141	259	531	**15,931**
Disposals	-	-	-	-	-	**-**
Balance, March 31, 2023	473	12,732	295,041	5,784	6,919	**320,949**
Accumulated depreciation						
Balance, April 1, 2022	-	2,444	67,865	812	3,691	**74,812**
Depreciation	-	237	6,954	113	740	**8,044**
Depreciation retired	-	-	-	-	-	**-**
Total accumulated depreciation, March 31, 2022	-	2,681	74,819	925	4,431	**82,856**
Net book value, March 31, 2023	$ 473	$ 10,051	$ 220,222	$ 4,859	$ 2,488	**$ 238,093**
Cost						
Balance, April 1, 2021						
Cost	$ 473	$ 12,683	$ 270,385	$ 5,374	$ 6,076	$ 294,991
Additions	-	49	9,523	151	312	10,035
Disposals	-	-	(8)	-	-	(8)
Balance, March 31, 2022	473	12,732	279,900	5,525	6,388	305,018
Accumulated depreciation						
Balance, April 1, 2021	-	2,208	61,212	703	2,970	67,093
Depreciation	-	236	6,655	109	721	7,721
Depreciation retired	-	-	(2)	-	-	(2)
Total accumulated depreciation, March 31, 2021	-	2,444	67,865	812	3,691	74,812
Net book value, March 31, 2022	$ 473	$ 10,288	$ 212,035	$ 4,713	$ 2,697	$ 230,206

Cumulative utility plant in service	**Water**	**Wastewater**	**Stormwater**	**Total**
Net book value, March 31, 2023	**$ 543,225**	**$ 582,495**	**$ 238,093**	**$ 1,363,813**
Net book value, March 31, 2022	$ 521,109	$ 582,847	$ 230,206	$ 1,334,162

Schedule A is presented in accordance with the NSUARB Handbook.
Utility plant in service under IFRS differs from the NSUARB Handbook due to exclusion of intangible assets, componentization of certain assets and differences in useful lives for depreciation.

Halifax Regional Water Commission
Schedule of long term debt
Year ended March 31, 2023 (in thousands)

Schedule B

	Interest rate	Maturity	Balance Remaining 2023	2022
Payable to Municipal Finance Corporation				
Water				
Debenture 32 A 1	1.636% to 3.480%	2022	$ -	$ 200
Debenture 32 C 1	1.510% to 3.160%	2022	-	5,904
Debenture 33 A 1	1.330% to 2.979%	2023	**5,562**	6,067
Debenture 33 B 1	1.285% to 3.614%	2023	**4,077**	4,447
Debenture 34 B 1	1.200% to 3.190%	2024	**8,203**	8,887
Debenture 35 A 1	1.040% to 2.894%	2025	**8,754**	9,427
Debenture 36 A 1	1.150% to 2.925%	2026	**800**	1,000
Debenture 36 B 1	1.150% to 2.506%	2026	**3,036**	3,254
Debenture 37 A 1	1.734% to 3.073%	2027	**2,625**	2,800
Debenture 38 A 1	2.060% to 3.295%	2028	**700**	900
Debenture 38 B 1	2.490% to 3.389%	2028	**4,800**	5,100
Debenture 39 A 1	2.015% to 2.561%	2029	**9,350**	9,900
Debenture 40 A 1	0.678% to 1.879%	2030	**10,800**	11,400
Debenture 40 B 1	0.400% to 2.376%	2031	**9,500**	10,000
Debenture 42 A 1	2.575% to 3.782%	2032	**13,138**	-
Debenture 42 B 1	4.177% to 4.116%	2032	**5,367**	-
Wastewater				
Debenture 32 A 1	1.636% to 3.480%	2022	-	1,318
Debenture 32 B 1	1.380% to 3.156%	2022	-	17,600
Debenture 32 C 1	1.510% to 3.160%	2022	-	2,527
Debenture 33 A 1	1.330% to 2.979%	2023	**9,275**	10,116
Debenture 33 B 1	1.285% to 3.614%	2023	**5,991**	6,536
Debenture 34 A 1	1.245% to 3.347%	2024	**3,342**	3,620
Debenture 34 B 1	1.200% to 3.190%	2024	**5,151**	5,581
Debenture 35 A 1	1.040% to 2.894%	2025	**9,172**	9,877
Debenture 36 B 1	1.150% to 2.506%	2026	**1,268**	1,360
Debenture 37 A 1	1.734% to 3.073%	2027	**4,575**	4,880
Debenture 38 B 1	2.490% to 3.389%	2028	**5,120**	5,440
Debenture 39 A 1	2.015% to 2.561%	2029	**12,750**	13,500
Debenture 40 A 1	0.678% to 1.879%	2030	**8,020**	8,560
Debenture 40 B 1	0.400% to 2.376%	2031	**5,700**	6,000
Debenture 42 A 1	2.575% to 3.782%	2032	**17,198**	-
Debenture 42 B 1	4.177% to 4.116%	2032	**2,297**	-
HHSP				
Debenture 39 A 1	2.015% to 2.561%	2029	**4,550**	5,200
Stormwater				
Debenture 33 A 1	1.330% to 2.979%	2023	**297**	324
Debenture 33 B 1	1.285% to 3.614%	2023	**1,452**	1,584
Debenture 34 B 1	1.200% to 3.190%	2024	**3,542**	3,837
Debenture 35 A 1	1.040% to 2.894%	2025	**2,100**	2,261
Debenture 36 B 1	1.150% to 2.506%	2026	**630**	676
Debenture 37 A 1	1.734% to 3.073%	2027	**300**	320
Debenture 38 B 1	2.490% to 3.389%	2028	**2,080**	2,210
Debenture 39 A 1	2.015% to 2.561%	2029	**3,400**	3,600
Debenture 40 A 1	0.678% to 1.879%	2030	**5,040**	5,320
Debenture 40 B 1	0.400% to 2.376%	2031	**3,800**	4,000
Debenture 42 A 1	2.575% to 3.782%	2032	**2,611**	-
			206,373	205,533
Payable to Halifax Regional Municipality				
Wastewater/Stormwater				
Debenture 24 B 1	2.840% to 5.940%	2024	**11,000**	16,500
Debenture 34 B 1	1.200% to 3.190%	2024	**2,000**	3,000
			13,000	19,500
			219,373	225,033
Less: debt issue costs			**(922)**	(851)
			218,451	224,182
Less: amount payable within one year			**(45,962)**	(46,272)
			$ 172,489	$ 177,910

Halifax Regional Water Commission
Schedule of earnings

Schedule C

Year ended March 31, 2023 (in thousands)

Water

	2023	2022
Operating revenues		
Water	$ 49,160	$ 48,189
Public fire protection	7,744	7,628
Private fire protection	1,377	1,270
Other operating revenue		
Bulk water stations	352	317
Late payment and connection fees	214	275
Miscellaneous	264	333
	59,111	58,012
Operating expenditures		
Water supply and treatment	11,646	10,760
Water transmission and distribution	11,757	11,316
Engineering and technology services	4,724	6,188
Regulatory services	1,446	1,220
Customer services	2,218	2,505
Corporate services	1,622	1,454
Administration services	2,974	3,429
Depreciation and amortization	12,186	11,489
	48,573	48,361
Earnings from operations before financial and other revenues and expenditures	10,538	9,651
Financial and other revenues		
Interest	343	123
Other	446	467
	789	590
Financial and other expenditures		
Interest on long term debt	2,434	2,113
Repayment of long term debt	6,148	5,808
Amortization of debt issue costs	87	81
Dividend/grant in lieu of taxes	5,608	5,553
Other	119	114
	14,396	13,669
Loss for the year	$ (3,069)	$ (3,428)

With the 2022 General Rate Application, the NSUARB approved the usage of accumulated Water surplus' to cover the current year deficit within Water up to $3,000 therefore the current year loss of $3,068 will be reduced.

Schedule C is presented in accordance with the NSUARB Handbook.

Halifax Regional Water Commission
Schedule of earnings
Year ended March 31, 2023 (in thousands)

Schedule C

Wastewater

	2023	2022
Operating revenues		
Wastewater	$ 82,622	$ 80,646
Other operating revenue		
Leachate and other contract revenue	454	483
Septage tipping fees	598	490
Over strength surcharge	8	-
Airplane effluent	79	3
Late payment and connection fees	202	209
Miscellaneous	233	234
	84,196	82,065
Operating expenditures		
Wastewater collection	13,691	12,988
Wastewater treatment	23,420	21,774
Engineering and technology services	6,846	6,014
Regulatory services	1,491	1,584
Customer services	2,044	2,032
Corporate services	1,308	1,383
Administration services	2,344	1,660
Depreciation and amortization	16,698	15,882
	67,842	63,317
Earnings from operations before financial and other revenues and expenditures	16,354	18,748
Financial and other revenues		
Interest	139	36
Other	424	151
	563	187
Financial and other expenditures		
Interest on long term debt	3,668	4,019
Repayment of long term debt	14,021	13,610
Amortization of debt issue costs	116	125
Dividend/grant in lieu of taxes	778	777
Other	10	15
	18,593	18,546
Earnings (loss) for the year	$ (1,676)	$ 389

Schedule C is presented in accordance with the NSUARB Handbook.

Halifax Regional Water Commission
Schedule of earnings
Year ended March 31, 2023 (in thousands)

Schedule C

Stormwater

	2023	2022
Operating revenues		
Stormwater site generated service	$ 6,931	$ 6,294
Stormwater right-of-way service	4,475	3,835
Other operating revenue		
Late payment and connection fees	258	170
Miscellaneous	118	126
	11,782	10,425
Operating expenditures		
Stormwater collection	4,719	4,566
Engineering and technology services	2,107	1,517
Regulatory services	1,497	1,588
Customer services	185	274
Corporate services	145	225
Administration services	260	270
Depreciation and amortization	2,710	2,403
	11,623	10,843
Loss from operations before financial and other revenue and expenditures	159	(418)
Financial and other revenues		
Interest	(53)	19
Financial and other expenditures		
Interest on long term debt	749	727
Repayment of long term debt	2,210	2,059
Amortization of debt issue costs	24	22
Dividend/grant in lieu of taxes	138	136
	3,121	2,944
Loss for the year	$ (3,015)	$ (3,343)

Schedule C is presented in accordance with the NSUARB Handbook.

Halifax Regional Water Commission
Schedule of earnings
Year ended March 31, 2023 (in thousands)

Schedule D

Regulated activities

	2023	2022
Operating revenues		
Water	**$ 49,160**	$ 48,189
Wastewater	**82,622**	80,646
Stormwater	**11,406**	10,129
Public fire protection	**7,744**	7,628
Private fire protection services	**1,377**	1,270
Other operating revenue	**1,620**	1,625
	153,929	149,487
Operating expenditures		
Water supply and treatment	**11,619**	10,720
Water transmission and distribution	**11,757**	11,316
Wastewater collection	**13,631**	12,965
Stormwater collection	**4,719**	4,566
Wastewater treatment	**22,670**	21,053
Engineering and technology services	**13,677**	13,719
Regulatory services	**4,434**	4,392
Customer services	**4,402**	4,777
Corporate services	**3,057**	3,044
Administration services	**5,422**	5,244
Depreciation and amortization	**31,575**	29,756
	126,963	121,552
Earnings from operations before financial and other revenues and expenditures	**26,966**	27,935
Financial and other revenues		
Interest	**429**	178
Other	**32**	28
	461	206
Financial and other expenditures		
Interest on long term debt	**6,851**	6,859
Repayment of long term debt	**22,379**	21,477
Amortization of debt issue costs	**227**	228
Dividend/grant in lieu of taxes	**6,524**	6,466
	35,981	35,030
Loss for the year	**$ (8,554)**	$ (6,889)

Schedule D is presented in accordance with the NSUARB Handbook.

Halifax Regional Water Commission
Schedule of earnings
Year ended March 31, 2023 (in thousands)

Schedule D

Unregulated activities

	2023	2022
Operating revenues		
Septage tipping fees	$ 598	$ 490
Leachate treatment and contract revenue	454	483
Airplane effluent	79	3
Other operating revenue	29	39
	1,160	1,015
Operating expenditures		
Water supply and treatment	27	40
Wastewater treatment	750	721
Wastewater collection	60	23
Customer services	45	34
Corporate services	18	18
Administration services	156	115
Depreciation and amortization	19	18
	1,075	969
Earnings from operations before financial and other revenues and expenditures	85	46
Financial and other revenues		
Other	838	590
Financial and other expenditures		
Other	129	129
Earnings for the year	$ 794	$ 507

Schedule D is presented in accordance with the NSUARB Handbook.

Halifax Regional Water Commission
Nova Scotia Utility and Review Board information

Schedule E

Year ended March 31, 2023 (in thousands)

Return on rate base	**2023**	2022
Rate of return on rate base for Water Service	**1.32%**	1.13%
Rate of return on rate base for Wastewater Service	**4.90%**	5.77%
Rate of return on rate base for Stormwater Service	**0.03%**	0.24%

Return on rate base is calculated based on earnings from operations before financial and other revenues and expenditures divided by the net book value of funded utility plant in service.

Special purpose reserves

	Wastewater and Stormwater Reserves	Regional Development Charge Water Reserve	Regional Development Charge Wastewater Reserve	Other Capital Reserves	**2023 Total**	2022 Total
Reserve, April 1	$ 1,964	$ 3,005	$ 64,113	$ 879	**$ 69,961**	$ 54,056
Contributions and interest	-	6,834	21,052	33	**27,919**	22,612
Expenditures	-	(4,003)	-	-	**(4,003)**	(6,707)
Reserve, March 31	$ 1,964	$ 5,836	$ 85,165	$ 912	**$ 93,877**	$ 69,961

Summarized consolidated operating results	**2023**	2022
Operating revenues	**$ 155,089**	$ 150,502
Operating expenditures	**128,038**	122,521
Earnings from operations before financial and other revenues and expenditures	**27,051**	27,981
Financial and other revenues	**1,299**	796
Financial and other expenditures	**36,110**	35,159
Loss for the year	**$ (7,760)**	$ (6,382)

Schedule E is presented in accordance with the NSUARB Handbook.

Halifax Water Wastewater Treatment Facilities (WWTFs) - Compliance with NS Environment Requirements

Fiscal 2022-2023

		Q1			Q2			Q3			Q4			
#	WWTF	April	May	June	July	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Exceedances
1	Aerotech		YES			NO			YES			YES		Q2 CBOD
2	Dartmouth	YES	YES	YES	NO	NO	NO	NO	YES	NO	YES	NO	YES	July, Aug, Sept CBOD; Oct, Dec, Feb TSS; Sept TOX
3	Eastern Passage	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	Compliant
4	Frame		YES			YES			YES			YES		Compliant
5	Halifax	YES	YES	YES	YES	NO	NO	NO	YES	YES	YES	YES	YES	Aug, Sept, Oct E.Coli; Sept TOX
6	Herring Cove	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	Compliant
7	Lakeside-Timberlea		NO			YES			YES			YES		Q1 TRC
8	Lockview-MacPherson		YES			YES			YES			YES		Compliant
9	Middle Musq		YES			YES			YES			YES		Compliant
10	Mill Cove	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	Compliant
11	North Preston	YES												Compliant
12	Steeves (Wellington)	YES												Compliant
13	Springfield Lake		YES			YES			YES			YES		Compliant
14	Uplands Park		YES			NO			YES			YES		Q2 TSS

Legend

NH3……Ammonia
TSS…….Total Suspended Solids
CBOD….Carbonaceous Biological Oxygen Demand
TRC……..Total Residual Chlorine
TP……..Total Phosphorus
N/A……Not Applicable
Tox…….Acute Toxicity

Notes

"No" indicates an exceedance whereas "Yes" indicates compliance with the NSE Approval.

"Exceedances" reflect the parameter limits in place for the month/quarter under consideration. Limits and sampling frequencies reflect Wastewater System Effluent Monitoring regulations. Averaging periods are based on WWTF size.

HRM owns the Sackville Leachate Treatment Facility and two recreation center waste treatment systems which are not included in this assessment. The province owns a hospital/school-based WWTF which is also not included. These facilities are operated by HW.

HALIFAX WATER INSTITUTIONAL CAPACITY REPORT

to the Nova Scotia Utility and Review Board

September 29, 2023

Submission Date: September 29, 2023

Halifax Water's institutional capacity to deliver existing programs and services as well as increased capital investment under the Integrated Resource Plan was an issue discussed during the 2022 rate application process. Halifax Water was directed by the NSUARB to report annually in September on its efforts to address institutional capacity. The first NSUARB report was filed with the Board in September 2022 and provided data and information related to the period from April 1, 2022 to August 31, 2022. This report will provide updated information to the end of the 2022/23 fiscal year.

FULL-TIME EQUIVALENT POSITIONS

As of September 1, 2022, Halifax Water had 550 employees. For the 2022/2023 fiscal year we anticipated hiring 24 net new positions. An additional ten, long-standing term positions have subsequently been made permanent. Some positions planned for the 2023-24 operating budget were advanced to help address capacity issues. As of March 31, 2023, Halifax Water has 555 employees.

Sept 1, 2022 – March 31, 2023

	Sept 1, 2022	March 31, 2023	Change
Permanent employees	525	530	+5
Term employees	25	25	0
Total:	550	555	+5

Total change for the fiscal year April 1, 2022 – March 31, 2023

April 1, 2022 – FTE Employees	547
New FTE Hires (Externally)	+35
Departures (Sept 1 – March 31)	-43
New Positions filled internally	+16
TOTAL March 31, 2023	***555***

The break-down of changes in actual employee numbers by department is shown below:

	April 1, 2022	August 31, 2022	March 31, 2023	Change
Administration	18	20	20	+2
Corporate Services	73	72	72	-1
Engineering and Technology Services	118	120	125	+7
Operations	292	289	289	-3
Regulatory Services	46	49	49	+3
Total	547	550	555	+8

For the 2023/24 fiscal year, Halifax Water has posted 92 competitions between April 1, 2023 and August 31, 2023, and successfully concluded 54 as of August 31, 2023. The majority of these are to fill existing positions that have become vacant due to lateral or ascending internal movements. There were 48 net new positions included in the 2023/2024 Operating Budget. Of those 48, 19 have been posted and 8 have filled.

TURNOVER

The average turnover rate at Halifax Water is 7.74% which is an overall increase of 6.74% from the previous fiscal year. In summary, in 2022/23 there have been six terminations, 19 resignations, 16 retirements, and two deaths of active employees for a total of 43 departures. Halifax Water can confirm that the turnover in employees impacted all departments within Halifax Water. Providing further detail relating to turnover by department would reveal personal information of third parties.

SUCCESSION PLANNING AND RETIREMENTS

There are currently 34 employees or 6.1% of the workforce eligible to retire. The percentage eligible to retire over the next five years (i.e., up to December 31, 2028) increases to 95 employees or 17.10%.

Halifax Water has a talent management program to help employees develop and progress their careers at Halifax Water. Some initiatives we have planned for this coming year to help promote and encourage the development of internal candidates to be ready to take on new roles include:

- Promote the employee development guide frequently and introduce during onboarding of all new hires.
- Roll out the Diversity and Inclusion Fair Hiring policy
- Continue to provide supervisory training “Performance Matters” to staff, including unionized employees that aspire and take initiative to progress into supervisory roles.
- Continue to promote the training and development and lifelong learning initiatives available to all employees.
- Continue to develop a culture where performance feedback is welcomed and well received.

RECRUITMENT

Halifax Water posted 168 competitions between April 1, 2022 and March 31, 2023, and successfully concluded 134 as of March 31, 2023. The majority of these were to fill existing positions that have become vacant due to lateral or ascending internal movements. There were 24 net new positions included in the 2022/2023 operating budget. Of those 24, 20 have been filled, one position was withdrawn, and two are currently in progress. The balance will be carried over to be filled in 2023/24.

ATTRACTION OF NEW EMPLOYEES

There has been an increase in attraction concerns in the last half of the 2022/23 fiscal year throughout the organization. Some areas that are concerning are in Procurement, Accounting, Finance, Water Treatment, Human Resources and Engineering Technologists. There are also retention concerns for new hires as some have left within six months of being hired. We have conducted exit interviews and believe the retention issues are primarily due to the challenging job market that exists currently.

Halifax Water will continue to consider adjusting hiring standards to allow for more flexibility in accepting applicants that do not meet all qualifications with longer probationary periods to allow for skills development.

RETENTION OF EXISTING EMPLOYEES

In its 2022 report to the Board, Halifax Water identified three retention strategies. Those strategies are listed below along with comments on the results of these strategies:

- Introducing an expanded mental health benefit – Halifax Water offers mental health services through both its internal Occupational Health and Hygienist and through Homewood Health, a third-party provider of mental health care services such as articles, best practices, and counselling. Both the OHH and Homewood Health have been well-received by employees.
- Introducing optional life and critical illness insurance offerings – Each employee group voted in favour of this initiative, which was communicated to the Pension and Benefits Committee in March 2023. We are hoping to move forward with the rollout in fall of 2023.
- Updating and re-evaluating some job descriptions as required and benchmarking compensation against market – Halifax Water engaged in an extensive and collaborative review of all jobs within CUPE Local 227, the results of which are currently being reviewed by senior management.

Halifax Water maintains a competitive total compensation package. Some initiatives this year to help with attraction and retention include:

- Introducing the Diversity and Inclusion Fair Hiring policy
- Introducing optional life and critical illness insurance offerings
- Increasing resources in the Human Resource department
- Re-alignment of Engineering and Technology Services department
- Conducting the CUPE Local 227 Job Evaluation review process
- Continue to update and re-evaluate job descriptions as required and benchmarking compensation against market
- Promote the Awards recognition program
- Collective bargaining to obtain collective agreements

ENGINEERING AND TECHNOLOGY SERVICES REORGANIZATION

Halifax Water recently completed an organizational realignment of the Engineering & Technology Services Department. These changes became effective in April 2023 and continue for filling vacancies. The realignment resulted in six business units organized to support implementation of the Integrated Resource Plan. The business units are:

- Asset Management & Capital Planning
- Infrastructure Planning
- Capital Project Delivery
- Energy Efficiency & Business Development
- Strategic Projects
- Information & Technology Services

In the fall of 2022, a process was undertaken to identify a leader of each group. Following that, through the winter of 2023, an extensive expression of interest process was undertaken to allow existing staff to find a suitable role in each of the new groups. This effort involved approximately 30 staff and required development of new job descriptions. Through this process, four FTE's were added to the engineering staff complement.

The following activities are a priority for the 2023/24 fiscal year:

- Continue to transition to develop new business processes for the new groups in Engineering & Technology Services.
- Continue to transition staff and workloads to new roles.
- Develop stage-gating process and transition capital budget process accordingly.
- Hire ten new staff for competitions launched in spring 2023.
- Complete Institutional Capacity Study and develop a plan to fill identified gaps.

HALIFAX WATER SEPTEMBER REPORTING

to the Nova Scotia Utility and Review Board

September 29, 2023

Contents

1. Introduction

The Nova Scotia Utility and Review Board (NSUARB or Board) has directed Halifax Water to submit reports to the NSUARB on an annual basis in relation to various programs and assets at various times.

In late spring 2021, Halifax Water requested direction from the Board regarding these reports, given they overlapped in both timing and subject matter. In July 2021 in matter M10139, the NSUARB approved a revised annual reporting schedule consolidating various Halifax Water annual reporting requirements.

1.1 Origin of Reporting Requirements

This report stems from requests and directions from the Board in various matters. This report addresses these various reporting requirements as follows:

- Part 2 – Asset Management Program, including stormwater management
- Part 3 – Wet Weather Management Program, including private I/I reduction efforts and wastewater system hydraulic modeling
- Part 4 – Regulatory compliance update, including impact of potential future regulations

2. Asset Management Program

Related to the 2022 Annual Report, in the March 31, 2023 decision for M10773, the Nova Scotia Utility and Review Board (NSUARB) identified several key findings for consideration by Halifax Water as the Asset Management (AM) program matures. These considerations include (reference section in report):

- Overall resourcing to achieve Asset Management objectives (2.3)
- Roadmap implementation progress (2.4)
- Annual update on the condition assessment program (0)
- Closed circuit television (CCTV) program – progress against anticipated targets and inspection prioritization (2.6)

In addition to foundational context for the asset management program (2.1), the annual report provides updates on the annual AM statistics and summary (2.2), achievements in the past year (2.7), and activities planned for the next year (2.8).

2.1. Foundational Asset Management

Asset Management is the practice of managing assets to sustainably deliver services. The International Organization for Standardization (ISO) in ISO 55000 states that: “Asset management enables an organization to realize value from assets in the achievement of its organizational objectives.” Halifax Water’s purpose is to supply and safeguard sustainable, high-quality water

services. Service delivery relies on having assets in good working order, a skilled workforce, accurate data, and robust data management practices. Successful AM programs incorporate a culture of collaboration, communication, and adaptability.

Halifax Water's AM Program is grounded by industry leaders in the field. Specifically, staff have looked to organizations including the Institute of Asset Management (IAM), ISO, The Global Forum on Maintenance & Asset Management (GFMAM), The Institute of Public Works Engineering Australasia (IPWEA) and organizations within Canada for guidance and references. Canadian resources include Asset Management British Columbia (AMBC), Infrastructure Asset Management Alberta (IAMA), Asset Management Saskatchewan (AM-SK), Asset Management Ontario (AMOntario), the Canadian Network of Asset Managers (CNAM), and the Canadian Infrastructure Report Card (CIRC).

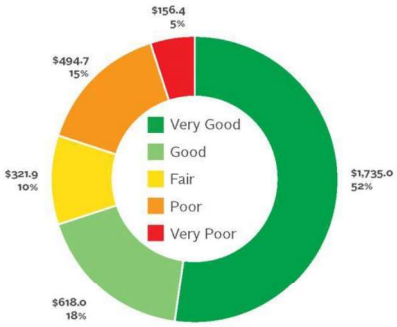
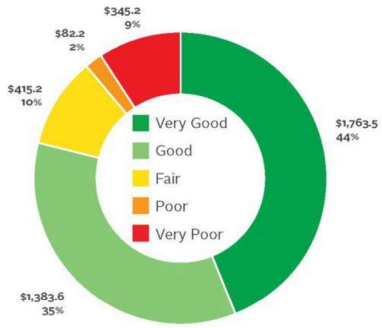
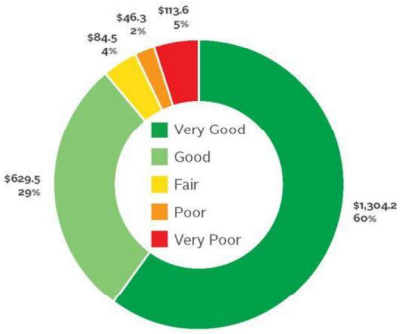
The program began in 2011 and continues to evolve. With the 2021 update to the AM Roadmap, implementation activities have been re-prioritized.

2.2. Asset Management Statistics and Summary

Halifax Water's assets enable the utility to deliver water, wastewater, and stormwater services to the customers of Halifax Regional Municipality (HALIFAX). Halifax Water compiles statistics annually about its assets to present a state of good repair report on the inventory, replacement value, condition profile, and the anticipated asset renewal needs over thirty years. The statistics summary formed part of the annual Asset Management Plan (AMP). In 2022, staff shifted efforts to continue providing the annual statistics summary, however, the full AMP write would be updated on a 5-year cycle consistent with Halifax Water's long-term infrastructure program. Specifically, the next AMP will be part of the upcoming Integrated Resource Plan (IRP).

The AM statistics cover fourteen (14) asset classes: Water – supply plants, supply dams, structures, transmission mains, distribution mains, and reservoirs; Wastewater – treatment facilities, structures, gravity sewers, and forcemains; and Stormwater – management structures, gravity sewers, cross culverts, and driveway culverts and ditches. Table 1 shows the summary of the 2022/23 statistics:

Table 1 – 2022/23 Asset Management Statistics Summary

System	Inventory	Condition & Valuation
	• 1,581 KM of water mains (transmission and distribution) • 8 supply plants • 6 water supply dams • 20 booster stations • 143 chambers • 17 reservoirs	Replacement Value: $3,325.9M 
	• 1,432 KM of wastewater sewers (gravity and forcemain) • 14 treatment facilities • 1 biosolids processing facility • 165 pumping stations • 5 wastewater holding tanks	Replacement Value: $3,989.8M 
	• 881 KM of stormwater sewers • 2,737 cross culverts • 17,556 driveway culverts (estimated) • 602 KM of ditches (estimated) • 40 stormwater management structures	Replacement Value: $2,178.1M 

Key changes in the 2022/23 annual AM statistics are:

1. Used Halifax Water's recently configured AM data management solution (Citywide Asset Manager module) for some asset classes.
2. Introduced deterioration curves instead of straight line deterioration relationship for some asset classes.
3. Updated cost estimates for major projects nearing construction phase.
4. Continued incorporating asset condition data from closed circuit television (CCTV) inspections.

5. Applied the current Halifax Statistics Canada Building Construction Price Index for non-residential buildings (7.64%) to replacement costs in the valuation.
6. Extension of the stormwater service boundary (increasing the number of driveway and cross culverts).

Comparing the use of the AM data management Citywide Asset Manager module to the previous 2021/22 method, the condition profile for 2022/23 appears greatly improved. There are several factors that have influenced this result including: the adjustment of the condition score intervals, introduction of the deterioration curves, and completion of capital renewal projects.

The Citywide Asset Manager module implementation is being phased. As more features are configured, staff will be able to replace legacy spreadsheet analysis done for some asset classes. A future step will be purchasing and configuring of the decision support system (DSS) module of Citywide.

2.2.1. Condition Score Intervals

The Citywide Asset Manager module assumptions and set points affect model outputs. Condition scoring has been done using a 1 to 5 range. Historically, Halifax Water has assumed a straight line deterioration and a change in condition grade at 20% increments. Therefore, 20% of an asset's life has been expended (or 80-100% of its estimated service life remains) when its condition is at grade 1 (Very Good) – refer to Table 2 for more information about the condition grades and definitions.

The 2016 CIRC Asset Management Primer definitions were updated slightly with the roll out of the Canadian Core Public Infrastructure Survey (CCPIS) in 2017 and subsequently, the CIRC 2019 process adopted the CCPIS long definitions. The short descriptions from the 2016 CIRC Asset Management Primer remain valid and offer an abbreviated statement (refer to italicized segments) relative to the numeric and short title descriptors. These shorter statements connect the condition grade to the impact on service.

Table 2 – Condition Grades and Definitions

Grade	Short Title	Canadian Core Public Infrastructure Survey (CCPIS) 2017 Definition Adopted in 2019 Canadian Infrastructure Report Card (CIRC)	2016 CIRC Asset Management Primer	% of Remaining Estimated Service Life (ESL)
1	**Very Good**	The asset is fit for the future. It is well maintained, in good condition, new or recently rehabilitated.	*Fit for the future* – Well maintained, good condition, new or recently rehabilitated.	80-100%
2	**Good**	The asset is adequate. It is acceptable and generally within the mid-stage of its expected service life.	*Adequate for now* – Acceptable, generally approaching mid stage of expected service life.	60-79%

Grade	Short Title	Canadian Core Public Infrastructure Survey (CCPIS) 2017 Definition Adopted in 2019 Canadian Infrastructure Report Card (CIRC)	2016 CIRC Asset Management Primer	% of Remaining Estimated Service Life (ESL)
3	**Fair**	The asset requires attention. The asset shows signs of deterioration, and some elements exhibit deficiencies.	*Requires attention* – Signs of deterioration, some elements exhibit deficiencies.	40-59%
4	**Poor**	There is an increasing potential for its condition to affect the service it provides. The asset is approaching the end of its service life, the condition is below the standard and a large portion of the system exhibits significant deterioration.	*At risk of affecting service* – Approaching end of service life, condition below standard, large portion of system exhibits significant deterioration.	20-39%
5	**Very Poor**	The asset is unfit for sustained service. It is near or beyond its expected service life and shows widespread signs of advanced deterioration. Some assets may be unusable.	*Unfit for sustained service* – Near or beyond expected service life, widespread signs of advanced deterioration, some assets may be unusable.	<20%
	Unknown	Not enough data exists to respond.		

In application, the software shows the 5 discrete scores. The difference between 1 and 5 is 4. To create the 20% deterioration bands (5 bands) for condition grade transition, the interval value must be less than 1 (4 divided by 5 equals 0.8 for each interval). Citywide has been configured to show the condition grade intervals and is correlated to the word description and % of remaining estimated service life (ESL) – refer to Table 3.

Table 3 – Citywide Condition Grade Intervals

Grade	Short Title	% Remaining ESL	Transition Range
1	**Very Good**	80-100%	**1.00 – 1.80**
2	**Good**	60-79%	**1.81 – 2.60**
3	**Fair**	40-59%	**2.61 – 3.40**
4	**Poor**	20-39%	**3.41 – 4.20**
5	**Very Poor**	<20%	**4.21 – 5.00**

2.2.2. Deterioration Curves

While transitioning to Citywide for compiling the annual AM statistics, staff delved into understanding how the software calculates replacement timing using different deterioration options. Historically for the AM statistics, Halifax Water has used straight line deterioration to determine how an asset's condition will degrade over its estimated service life. Citywide offers several deterioration options:

- Straight line deterioration
- Deterioration curve (one option)
- Roads (Gravel)
- Roads (LCB/ICB) – Low Class Bituminous/Intermediate Class Bituminous
- Roads (HCB) – High Class Bituminous

The straight line deterioration is simple to apply however, it may not reflect a realistic model of degradation of the asset over time. Straight line deterioration shows a uniform drop in condition however, it may prematurely indicate a need for intervention early in the asset's life. In comparison, the deterioration curve option provides for an asset deterioration relationship that more closely aligns with expected changes in the early years, but it shows a rapid deterioration in the latter years. Neither option works for all asset classes. Staff opted to apply either the straight or curved line options that best models the expected deterioration based on historical performance, observations in the field, and general institutional knowledge from staff.

Using the condition grade intervals discussed, the output from Citywide for straight line deterioration and the deterioration curve are shown in Figure 1 and Figure 2, respectively. The graphs are based on a generic asset with an assumed estimated service life of 50 years. For Figure 1, the asset deteriorates at a constant rate and moves from one grade to the next every 10 years.

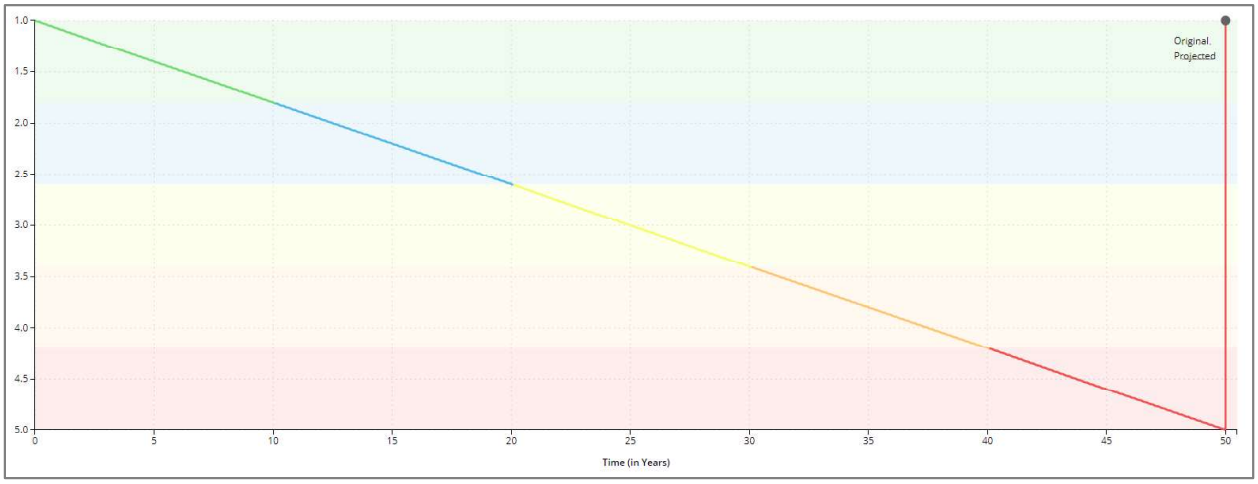


Figure 1 – Typical Straight Line Deterioration

In comparison in Figure 2, using the Citywide deterioration curve, the asset moves through the grades at a varied rate. At approximately year 30, the asset moves from grade 1 to grade 2 in contrast to that transition occurring at year 10 for the straight line deterioration model. Additionally, there is a much more rapid deterioration once grade 3 is reached with the asset cycling through condition grades 3 to 5 in the last 10 years of its life.

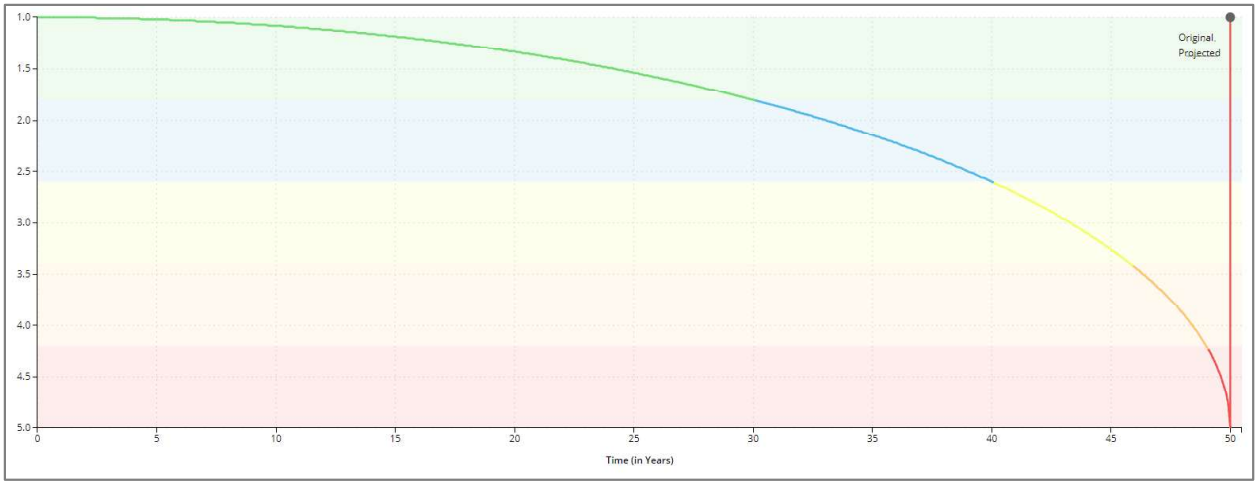


Figure 2 – Available Citywide Deterioration Curve

Table 4 provides a simple comparison of the deterioration models based on when the grade changes for the example of an asset with a 50-year estimated service life.

Table 4 – Transition Points - Citywide Deterioration Curves

Grade Transition	Transition Point – Straight Line Deterioration	Transition Point – Deterioration Curve
1 to 2	10	30
2 to 3	20	40
3 to 4	30	46
4 to 5	40	49
Time for Replacement	50	50

By applying the curve instead of the straight line deterioration, the assets show as being in better condition longer but with a rapid decline from grades 3 to 5 (e.g., in this case, lots of change in the last 5 years of the asset's life). Note that the replacement year does not change; the time to be observing the need for replacement changes. The projected condition shows a more favourable profile overall when the deterioration curve model is applied, however, staff want to validate the reality of the model.

Citywide offers an opportunity for staff to explore the impacts of adjusting factors like the interval between grades, and the ESL and the effect on the outcomes. This work should help staff identify deterioration curves that model the timing, and speed of degradation that has been observed in the field. The Citywide out of the box solution offers only a single deterioration curve option excluding the road curve options. Staff will be investigating Citywide to better understand the relationship of the software factors and determine if custom deterioration curves can be applied. While, the roads curves are intuitively not applicable out of the box, staff will be assessing the relationship derived from these curves to determine if they better approximate asset

deterioration for some asset classes. Ideally, staff will be able to work closely with Public Sector Digest (PSD) – the vendors of Citywide – to create some alternative deterioration curves if needed.

2.2.2.1. Application Methods for Each Asset Class

In developing the 2022/23 AM statistics, staff applied deterioration curves as outlined in Table 5 (Water), Table 6 (Wastewater), and Table 7 (Stormwater). One deterioration curve used across all asset classes was not feasible. Where decisions were needed, staff reviewed the options with the impacted Asset Management Implementation Team (AMIT) unless otherwise indicated in the tables. Where Citywide was used, the impact on the condition has been identified in the tables. For significant impacts, a note is provided beneath the associated table. The adjustments to condition do not affect replacement costs or % of asset base values.

Table 5 – Application of Citywide Curves and Impact – Water Asset Classes

Asset Type	2021/22 AM Statistics	2022/23 AM Statistics	Impact on Reported Condition	Replacement Cost ($2023 M)
			Use of Citywide	% of Asset Base
Water Supply Plants	Assigned at facility level of the data hierarchy (reviewed by AMIT)	Assigned at facility level of the data hierarchy (reviewed by AMIT) – Ongoing activities to collect condition data at a system level [1]	No change	$389.9
			No	11.7
Dams	Assigned at facility level (reviewed by AMIT)	Assigned at facility level, (reviewed by AMIT)	No change	$54.1
			No	1.6
Reservoirs	Assigned at facility level (reviewed by AMIT)	Assigned at facility level, (reviewed by AMIT)	No change	$177.9
			No	5.4
Water Structures	Age based using historic spreadsheet, ESL by chamber type, 20% condition bands, straight line deterioration with some manager-reviewed overrides	Citywide, ESL by chamber type, 0.8 condition grade interval, condition bands, curved deterioration	Minor	$85.9
			Yes	2.6
Transmission Mains	Enhanced age based using ESL by material adjusted for leaks/breaks, 20% condition bands, straight line deterioration	Citywide, ESL by material, 0.8 condition grade interval, condition bands, curved deterioration [2]	Major	$885.9
			Yes	26.6
Distribution Mains	Age based using ESL by material, 20% condition	Citywide, ESL by material, 0.8 condition grade interval,	Major	$1732.1

Asset Type	2021/22 AM Statistics	2022/23 AM Statistics	Impact on Reported Condition Use of Citywide	Replacement Cost ($2023 M) % of Asset Base
	bands, straight line deterioration	condition bands, curved deterioration	Yes	52.1
			TOTALS	$3325.9
				100.0

1. Asset Condition project described in section 2.5.5.
2. Citywide output not adjusted for leaks/breaks in 2022/23 data. Using the basic approach from Citywide for 2022/23 with future work to incorporate risk factors/level of service (LOS) during decision support system (DSS) phase implementation.

Table 6 – Application of Citywide Curves and Impact – Wastewater Asset Classes

Asset Type	2021/22 AM Statistics	2022/23 AM Statistics	Impact on Reported Condition Use of Citywide	Replacement Cost ($2023 M) % of Asset Base
Wastewater Treatment Facilities	Assigned at facility level of the data hierarchy (reviewed by AMIT)	Carried forward condition grades from 2021/22 AMP – Ongoing activities to collect condition data at a system level [1]	No change	$829.8
			No	20.8
Wastewater Structures	Component condition grades from 2015 Dillon Capital Planning and Inventory Tool (CPIT) then pro-rated to match overall condition replacement cost	Component condition grades from 2015 Dillon CPIT then pro-rated to match overall condition replacement cost	No change	$703.0
			No	17.6
Wastewater Gravity Sewers	Enhanced age based using ESL by material with CCTV grades and lining data, where available, overriding age-based calculation, 20% condition bands, straight line deterioration	Citywide, ESL by material with CCTV grades and lining data [2], where available, overriding age-based calculation, 0.8 condition grade interval, curved deterioration	Major	$2116.1
			Yes	53.0
Forcemains and Pressure Pipes	Enhanced age based using ESL by material adjusted for breaks, 20% condition bands, straight line deterioration	Citywide, ESL by material, 0.8 condition grade interval, curved deterioration. [3]	Major	$340.9
			Yes	8.6
			TOTALS	$3989.8
				100.0

1. Asset Condition project described in section 2.5.5.
2. Note that the addition of a lifecycle event (lining) for wastewater gravity sewers is triggered when the condition grade reaches 4.5 for concrete and vitrified clay pipes. This lifecycle event impacts the 30-year capital replacement profile but does not impact the reported condition grade for this year's AM statistics. The impacted segments will show improved condition in future year's following the intervention.
3. Citywide output not adjusted for leaks/breaks in 2022/23 data. Using the basic approach from Citywide for 2022/23 with future work to incorporate risk factors/level of service (LOS) during decision support system (DSS) phase implementation.

Table 7 – Application of Citywide Curves and Impact – Stormwater Asset Classes

Asset Type	2021/22 AM Statistics	2022/23 AM Statistics	Impact on Reported Condition Use of Citywide	Replacement Cost ($2023 M) % of Asset Base
Stormwater Management Structures	Age based using ESL by structure type, 20% condition bands, straight line deterioration	Citywide, ESL by structure type, 0.8 condition bands, curved deterioration	Very Minor	$4.1
			Yes	0.2
Stormwater Gravity Sewers	Enhanced age based using ESL by material with CCTV grades, where available, overriding age-based calculation, 20% condition bands, straight line deterioration. [1]	Citywide, ESL by material with CCTV grades, where available, overriding age-based calculation, 0.8 condition bands, curved deterioration. [2]	Major	$1747.3
			Yes	80.2
Cross Culverts (includes off-street culverts)	Enhanced age based using ESL by material adjusted for strategic impact (based on location), 20% condition bands, straight line deterioration	Citywide, ESL by material, 0.8 condition bands, but retained straight line deterioration approach	Minor as retained straight line deterioration	$348.9
			Yes	16.0
Driveway Culverts	9,315 with site assessed condition, pro-rated to 14,409 inventory	12,122 with site assessed condition, pro-rated [3] to 17,556 inventory	No change	$77.8
			No	3.6
			TOTALS	$2178.1
				100.0

1. 10.8% of the gravity sewers had no install date. For the 2021/22 AM statistics, condition was pro-rated by material type and the associated average ESL for the unknown install dates.
2. Data gap on install date has been reduced to 6.1% for gravity sewers. For the 2022/23 AM statistics, condition was pro-rated based on the percentage condition grade splits for the majority 94% of the gravity sewer inventory.
3. Driveway culverts are run to failure assets meaning that there is typically no mid-life asset intervention aimed at extending the asset's life. The note for both the 2021/22 and 2022/23 data indicates that the site assessed condition grade percentages were assumed across the whole inventory to account for the assets with unknown condition. That is, since 18% of the 12,122 known field verified cross culverts (or 2,184) in the 2022/23 AM statistics were found to be condition grade 1 (Very Good), this ratio was applied to the whole inventory number (e.g., 18% of 17,556). While not an optimal approach, the effort to fill the data gap relative to the risk to the utility since this is a run to failure asset, is better spent elsewhere analyzing higher criticality assets.

2.2.2.2. Further Consideration of Citywide Deterioration Options

Some factors Halifax Water has used for its state of good repair reporting are not easily incorporated into Citywide. As noted for the wastewater and stormwater gravity sewers, integrating actual CCTV condition data in Citywide results in a condition point being inserted onto the deterioration curve. The same applies for any field verified condition grade that has an

assessed date. For stormwater cross culverts, Halifax Water has field verified condition data with a high confidence and acceptance level. Using the out of the box deterioration curve, there were results that conflicted with the field verified condition grades. Staff decided to retain the straight line deterioration approach since field verified condition grades placed on the available Citywide deterioration resulted in a high number of assets moving to condition grade 4 (Poor) or grade 5 (Very Poor).

Error! Reference source not found. shows an example of a cross culvert (P523915) with an install date of 1984, material type of corrugated steel pipe (CSP), an ESL of 40, and Citywide deterioration curve. **Error! Reference source not found.** shows the same asset (P523915) using a straight line deterioration model from initial install date. While the Citywide deterioration curve shows that an asset would reach condition grade 3 later in its life, its decline to condition grade 5 is more rapid. Additionally, when using the updated set point from the field and applying the Citywide deterioration curve, the asset's projected life is further shortened.

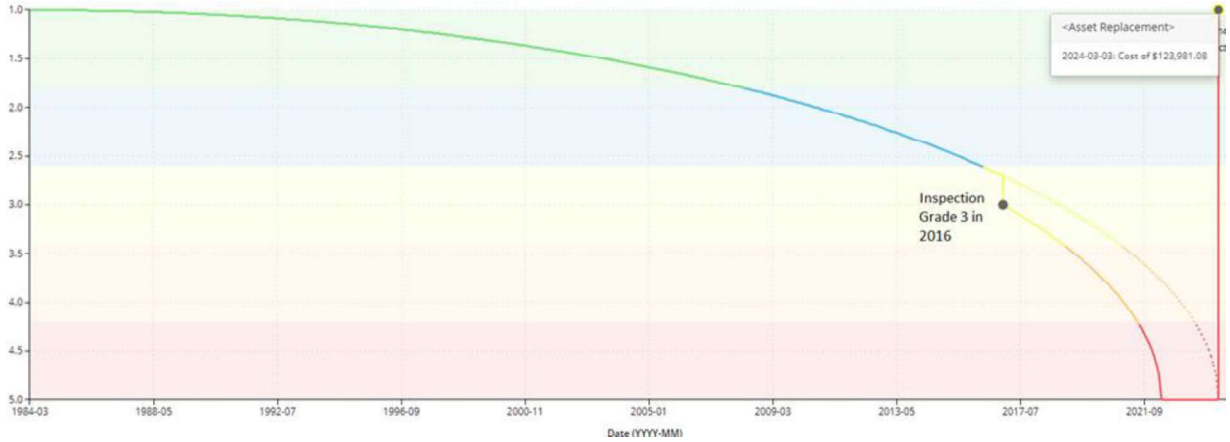


Figure 3 – Example Deterioration Curves Reset Using Field Verified Data Point (Asset P523915)

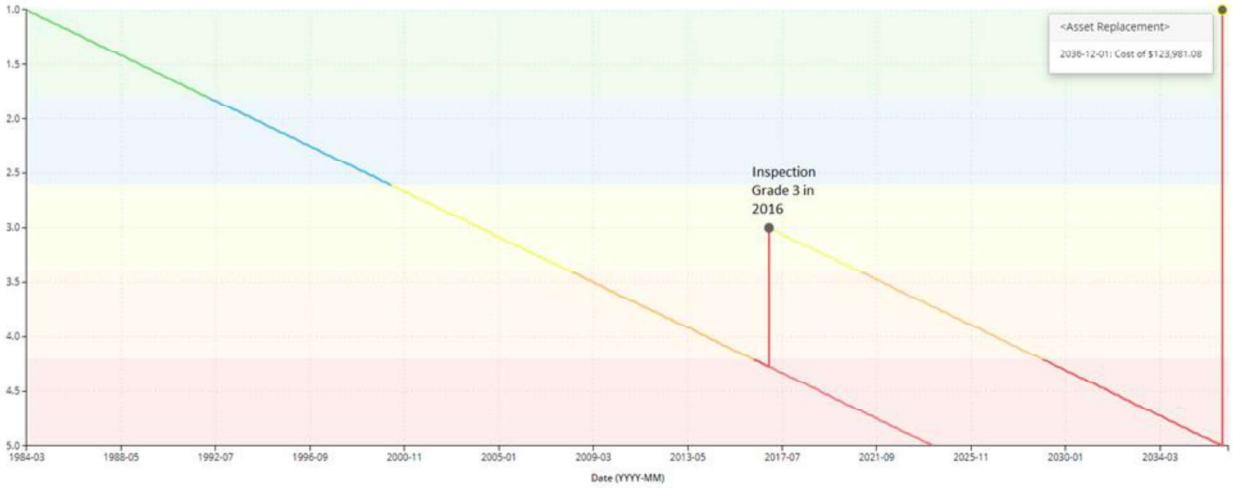


Figure 4 – Example Straight Line Deterioration Reset Using Field Verified Data Point (Asset P523915)

The Citywide software provides out of the box graph results with limited ability to adjust the outputs. In **Error! Reference source not found.**, the asset replacement point (depicted by the vertical line) is showing relative to the original deterioration curve. However, with the curve adjustment based on the field verified condition grade, the projected replacement point (vertical line) should be showing relative to the intersection of the deterioration curve at grade 5. For the straight line deterioration in **Error! Reference source not found.**, the Citywide output responds to the adjusted field verified condition grade and the projected replacement point is adjusted to the update deterioration line. This is a limitation with the software that staff are investigating to determine if greater flexibility can be offered for graph outputs.

In **Error! Reference source not found.**, the asset would have been at roughly half of its ESL based on the field verified condition of 3. If the field verified condition grade was reset using the straight line deterioration (same slope), the asset life would be extended at least 10 years beyond its original ESL.

This shows that the relationship between condition and deterioration curves is complicated. One curve option cannot approximate the relationship equally for all assets or the same asset classes with different features (e.g., material). Staff are continuing to assess the limitations of the software and to develop an approach to approximate condition performance for each asset class.

Condition scores are a way to relatively rank assets based on the physical state of the asset at the time it is evaluated (e.g., a snapshot of that moment). This score is used with the defined estimated service life to determine the likely time to intervene and improve the condition of the asset. This may involve repair, rehabilitation, or replacement. It should be used collectively with the full asset base to develop an asset renewal program. It is not intended to drive a reactive response to the scores and an immediate intervention without first looking at what else may be needed. For example, are there other assets in the corridor or vicinity, is the asset slated for a capacity increase, is the utility working to eliminate a particular material type, model, or supplier of an asset, are there asset renewals that should be grouped together for efficient capital delivery?

The goal is to have a more planned approach to asset interventions where possible. As a relative ranking factor, it is not automatic that a condition score of 5 results in an immediate intervention. The score is intended to draw attention to the need for intervention. Condition is only one factor to be considered in planning when, what, and how to intervene. Other factors may include, but not be limited to, performance, risk, capacity, operability, coordination with other work, health and safety, etc. And engineering and operational judgement are equal considerations.

2.2.3. Completion of Capital Projects

The third (minor) factor influencing the change in the condition profile is the completion of key capital projects. Project completion moved the assigned condition grade back to condition grade 1 for the Cowie Hill Reservoir project. No other major projects are influencing the reported condition for 2022/23.

Using the adjusted condition grades and compiling the inventory, asset valuations, and developing a long-term asset renewal outlook, staff created a poster summary (refer to **Error! Reference source not found.**).

Figure 5 – 2022/23 Asset Management Statistics – Poster

2.3. Realignment and Resourcing

Halifax Water recently completed an organizational realignment of the Engineering & Technology Services Department. These changes became effective in April 2023 and continue for filling vacancies. The realignment resulted in six (6) business units organized to support implementation of the Integrated Resource Plan (IRP). The business units are:

- Asset Management & Capital Planning
- Infrastructure Planning
- Capital Project Delivery
- Energy Efficiency & Business Development
- Strategic Projects
- Information & Technology Services

The priority for filling vacancies is focused on the needs identified in the last fiscal year (ending March 31, 2023), however, several additional resources were identified in the current fiscal year (April 1, 2023 to March 31, 2024). Three resources are identified in the initial hiring cohort of 2023/24 resources for the Asset Management team. Recruitment is in progress.

The effort involved in the departmental realignment, the ongoing resource constraints, and the time to recruit additional personnel have consumed significant time this year. Consequently, overall progress on the AM Program is steady but slower than Halifax Water intended. Staff are being added to assist with achieving the ambitious AM Program and Roadmap goals.

2.4. Roadmap Implementation

Halifax Water updated its AM Roadmap in 2021 through a reassessment of its AM program. The reassessment followed the Federation of Canadian Municipalities' (FCMs) Asset Management Readiness Scale (AMRS) assessment tool that considers five competency areas:

- Policy and Governance
- People and Leadership
- Data and Information
- Planning and Decision Making
- Contribution to AM Industry

The resulting updated AM Program Roadmap identified initiatives for short (immediate and 1 year), medium (2 and 3 year), and long (4 and 5 year) term implementation. The Roadmap is an implementation guide that informs annual priorities while considering budget and resource constraints. As AM is a continuous improvement process, progress is tracked and opportunities to adjust specific timing and sequencing of future Roadmap initiatives is part of the annual review.

A summary of Roadmap progress is provided in Table 8.

Table 8 – Progress on Asset Management Roadmap Year 0 to 1 Initiatives

Element	AM Activity	Progress summary
Policy and Governance	*AM Policy (1a,b,c)*	Approved by Halifax Water Board – September 2022.
	SAMP (9a,b)	In progress with Final Report expected - September 2023.
	AM Program Review Process (5a)	Completed with creation of Infrastructure Planning Committee – December 2021.
People and Leadership	*AM Program Resource Plan (0b)*	Ongoing – subject to Engineering & Technology Services departmental realignment and Institutional Capacity Assessment (planned for 2023).
	AM Advisory Committee (3a)	Formed in December 2021 as the Infrastructure Planning Committee.
	AM Leadership Support (3b)	Completed with creation of Infrastructure Planning Committee – December 2021.
	Halifax Water Board Communications (2a)	Annual updates as elements of the AM Roadmap are completed.
	AM Enterprise Change Management Program (6a)	Deferred due to staff capacity issues.
	AM Cultural Change Management Program (7a)	Deferred due to staff capacity issues.
Data and Information	*Data Improvement Program (n/a)*	Ongoing program – no anticipated end date.
	Critical Assets ID (8a)	Deferred due to staff capacity issues.
	LOS Framework (10a,b)	Deferred due to staff capacity issues.
	Condition Assessment Program (8b)	Subject to resource availability and completion of Critical Assets Identification project, Comprehensive Condition Assessment Program development is to follow (plan to start by September 2023).
Planning and Decision-Making	*Initial Project Prioritization (4a,b)*	Completed and published as the Enhanced Prioritization Methodology in May 2021.
	Annual AMP Update (n/a)	Updated annually for AM statistics (e.g., inventory, valuation, condition information, long-term reinvestment projection).
Contribution to AM Practice	*Halifax Water Board AM Training (2b)*	Deferred due to staff capacity issues.
	HW AM Staff Training Program (7b)	Initial training provided; future training to be scheduled.

2.5. Condition Assessment Program

In the 2022 September Reporting to NSUARB, an information request sought understanding about the proportion of each asset class that was supported by detailed asset condition assessments (reference M10773, IR-2 NSUARB). In response, Halifax Water provided a table indicating by asset class, the % of the inventory supported by condition assessments. Table 9 provides an update using current inventory data. Refer to Section 1 and Tables 5, 6, and 7 for

information related to application of deterioration curves, the impact on condition, and limitations of the phased Citywide Asset Manager module implementation on condition. Table 9 shows each asset class and the percentage of condition data determined from detailed condition assessments.

Table 9 – Percentage Detailed vs. Simplified Condition Assessment by Asset Class

AMP Asset Class	% Detailed Condition Assessment	% Simplified Condition Assessment	
		AMP Method	%
Water Supply Plants		Empirical	100
Water Supply Dams	100 [1]		
Water Chambers and Booster Stations		Age-Based	100
Water Transmission Mains		Age-Based [2]	100
Water Distribution Mains		Age-Based	100
Water Service Reservoirs	100		
Wastewater Treatment Facilities	100 [3]		
Wastewater Structures	100 [3]		
Wastewater Gravity Sewers	22 [4]	Age-Based [5]	78
Wastewater Forcemains		Age-Based [2]	100
Stormwater Management Structures		Age-Based	100
Stormwater Gravity Sewers	9 [6]	Age-Based [5]	91
Stormwater Cross Culverts	94 [7]	Age-Based [5]	6
Stormwater Driveway Culverts and Ditches		Statistical Condition Assessment	100

1. Dam Safety Review (DSR).
2. Estimated service lives vary based on pipe material only in 2022/23 with the introduction of Citywide.
3. Condition data is becoming out of date and needs to be updated.
4. Only 22% (285 km) of asset class is CCTV inspected with majority of asset condition age-based (78% or 1,019km).
5. Estimated service lives vary based on pipe material.
6. Only 9% (81 km) of asset class is CCTV inspected with majority of asset condition age-based (91% or 800 km).
7. Field verified condition assessment.

The initial configuration of the Citywide solution is built primarily on an age-based deterioration approach that can be modified by asset class for specific deterioration curves. As a minimum, Citywide needs an install date and an ESL. As staff configure and implement more features of the solution (e.g., risk, levels of service), factors like leak and break history, strategic importance can be incorporated into the solution. Engineering judgement can be incorporated by manually over-riding ESL and condition data.

Section 2.3 outlines changes to the organizational structure and discusses the status of bringing new resources on board. The AM Team is recruiting for three positions (manager, engineer, and technologist). With the addition of these critical staff members, emphasis on the condition assessment program will be a priority.

A condition assessment program allows for evidence-based, risk-based decisions for when to repair or replace deteriorating infrastructure. The condition assessment program will identify the suitable assessment methods for each asset class, what each method will provide as outputs, the

circumstances under which each method would be used (e.g., good for pressurized pipe, good for small/large diameter pipe, good up to certain pressure, good for certain horsepower or flow rate, etc.), confidence levels for each method, accuracy, repeatability and reassessment interval, feasibility of embedding the assessment practice into routine inspection programs if practical, operational impacts during assessment, order of magnitude cost for each method, evaluation of cost benefit for each method, and suitability for pilot testing the methods. The condition assessment program will also confirm the mode of delivery for the assessment (e.g., consultant or contractor delivered, in-house with staff from Operations, Engineering, AM, or combination, hybrid delivery such as a knowledge transfer assignment (i.e., consultant delivers first iteration and trains an in-house team for future assessments), or dedicated condition assessment teams). The program must also consider the data management implications for maintaining records (processes as well as source system such as CityWorks, Citywide, geographic information system (GIS), other), and having the data model available to accept the data.

Other activities undertaken in the past year, in support of the Condition Assessment Program, include attendance at an American Water Works Association (AWWA) course on watermain condition assessment, research of transmission main condition assessment technologies, review of the AWWA Effective Useful Life Planning Tool for Vertical Assets, an initial assessment of the Dunbrack Transmission Main emergency repair, and ongoing implementation of the Asset Condition project.

2.5.1. AWWA – Watermain Condition Assessment Course

AWWA offers a 3-day, in-person seminar focused on the issue of water pipeline condition assessment. While the program focused on water transmission and distribution pipes, some of the discussion is transferrable to the development of a broader condition assessment program for other asset classes. The seminar provides three modules: Getting started with your condition assessment program; choosing inspection methods and technologies to fit your needs; and budgeting and planning for condition assessment. The course references AWWA's Manual M77: Condition Assessment of Water Mains.

The Getting Started module covers topics including condition assessment (CA) program budgeting, data sources and risk assessment, valve assessments, leak detection, pressure monitoring, and soil corrosivity surveys. The Choosing Inspection Methods and Technologies module included an overview of inspection methods for pressure pipes, assessment of non-metallic pipe, "lower effort/limited data" inspections and measurements, and high-resolution inspection technologies. The Budgeting and Planning for Condition Assessment module covered topics of managing and using pipeline condition data, contracting options for CA, developing a project level budget for pipeline CA, and sustaining your CA program.

2.5.2. Transmission Main Condition Assessment Research

Building on the information learned during the AWWA course, staff decided to summarize available findings from recent experiences.

- A Halifax Water Transmission Main Risk Assessment and Prioritization Framework was completed with the help of CBCL in 2021. This Risk Assessment & Prioritization Framework and the Transmission Main Risk Assessment application will be used to prioritize future condition assessments together with consultation with Operations and Engineering staff.

- A variety of condition assessment technologies applicable to transmission and distribution mains including their capabilities, limitations, access requirements, and costs were reviewed to gain an understanding of the breadth of available technologies for transmission main assessments. Condition assessment technologies range from screening tools (using existing available data) to electromagnetic scanning, to acoustic methods, to pressure monitoring, to tethered and free-swimming devices. Some of the methods researched may be applicable to pressurized wastewater sewers (e.g., pressure sewers, forcemains). This information will help the expanded AM Team when the comprehensive condition assessment program is developed.

- Halifax Water has been an industry leader in water loss control programs since the early 2000s. By actively engaging strategies and programs in the four key focus areas outlined in the AWWA Manual 36 (the industry standard in effective water loss control programs), the utility has seen a 25% reduction in water production between 2000/2001 and 2022/2023 despite a growing population. The water loss control program has been broadened this year to include Advanced Pressure Management of the Halifax Peninsula and piloting of an active leak monitoring software. AM staff met with Operations staff to gain insight on Halifax Water's loss control program and the two new projects. By developing a better understanding of the water system and operational challenges, the AM Team can better inform the condition assessment and asset management program.

2.5.3. AWWA Effective Useful Life Analysis Tool

Another tool available from AWWA is the recently developed software tool that identifies the effective useful life (EUL) of various vertical water assets which is based on feedback from various sources for the associated assets. This EUL tool can provide useful data for planning the short term and long term management of these assets. While the product is available for use, it remains a work in progress as AWWA plans to collect more data from additional contributing sources to expand the dataset and improve the accuracy of the tool. More time is needed to investigate the efficacy of the tool and determine if it can be used by Halifax Water to inform future operational and capital reinvestment needs.

2.5.4. Dunbrack Watermain

While not a condition assessment project, the following information discusses a recent emergency repair undertaken by Halifax Water. This emergency repair helps to highlight the complexity associated with condition assessment programs. The transmission main is a critical component for delivering service to Halifax Water's customers. The effort involved in determining failure modes and methods to prevent them is necessary and can be extensive.

In July 2023, Halifax Water had to undertake an emergency repair of a section of 900mm diameter Hyprescon transmission main on Dunbrack Street near Walter Havill Drive. Hyprescon is a type of pre-stressed concrete cylinder pipe (PCCP) that is known for premature failure under certain conditions. Approximately 18 metres of transmission main was replaced. The pipe is 47 years old. The ESL for this type of pipe is 70 years therefore, in addition to the repair, staff investigated and compiled a list of the contributing factors that may have caused the break. Early review of the findings from the *in-situ* repair include:

- *Manufacturing era* – this main was installed in 1976. PCCP manufactured by Canron was extensively used for large diameter transmission main during the original Pockwock Water Supply project. The most problematic sections of the transmission main have been the 1200mm segments on Kearney Lake Road and Dunbrack Streets which have been bypassed, slip lined, or replaced now. An attempted line stop was halted when the pipe at that location was found to have an interior concrete core which was not cured (the wetted perimeter was properly cured however, between the concrete and the steel cylinder, the concrete was paste-like). Based on feedback from the contractor with extensive experience across North America, it appeared to be a manufacturing defect. However, Halifax Water has not observed this circumstance in other hot tap or line stop locations during the original construction and later in the 1990s. While it is likely not the only place in the system with uncured concrete, it is unlikely to be a widespread issue. Staff will need to explore ways to assess this phenomenon as it is not a defect detectable with conventional condition assessment techniques for PCCP that focus on wire breaks.

- *Material* – this is the first observed leak or break on the pipe section of 900mm PCCP transmission main; previous leaks have occurred at steel fittings and have been repaired or had proactive reinforcement installed to prevent further surface cracking.

- *Construction era or practices* – field observations indicate that the break location was the final connection for this phase and staff suspect the pipe segment may have been damaged during the original installation. This is supported by: a) presence of a single dresser closure (rather than a two-piece closure that would make a smoother connection); b) the pipe laying direction changed at this location with bells pointed both uphill and downhill (normal practice would have bells pointed uphill); and c) at the break location, the steel cylinder and wires were heavily rusted and a cut approximately 20cm long was observed in the cylinder at the base of the pipe (determined to be the source of the leak).

- *Pressure anomalies* – staff investigated pressure fluctuations that could have caused the break. While a pressure spike may have caused the final rupture, the factors listed previously established the slow decay in pipe structure and performance.

- *Soils and corrosion* – at the attempted line stop discussed above under the 'manufacturing era' section, staff observed the presence of water against the pipe cylinder and small

pinhole leaks that indicate some internal corrosion has begun at this location. The pipe segment is in the transition zone between slate and granite rock formations. With some corrosion already observed, the soils and groundwater conditions may contribute to a corrosion environment.

- *Leaks and breaks* – there is no previous leak or break history for this segment of the transmission main.

- *Road salt influence* – road salt has been a contributing factor for the 1200mm Kearney Lake Road and Dunbrack Street mains. However, this 900mm main is in the median and the road is graded away to the shoulders therefore, salt influence is unlikely.

There are several contributing factors to a slow weakening of the pipe structure. Additional investigation is warranted and will be part of the comprehensive condition assessment program. Understanding the contributing factors will allow for an exercise to assess transmission mains elsewhere in the network that have similar contributing factors to determine any near term monitoring or replacement needs. The benefit of doing this exercise will be dependent upon determining the number of similar infrastructure locations and the level of effort and cost to do the investigation.

2.5.5. Asset Condition Project

The objective of the Asset Condition project is to implement sustainable business processes for the ongoing collection of quality asset condition data. The project is independent of the comprehensive condition assessment program that is yet to be developed. It focuses on making use of existing technology (CityWorks – Halifax Water's maintenance management system, and GIS) and processes and capitalizing on regular inspection practices by Operations staff. Figure 6 shows the relationship between the condition assessment program, the Asset Condition project, and determining capital and operational priorities.

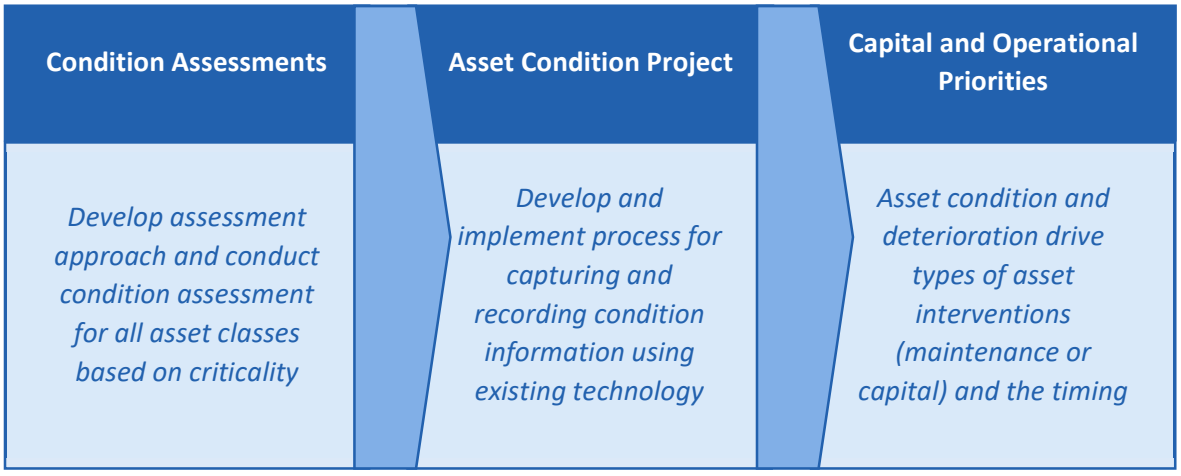


Figure 6 – Relationship Between Condition Assessments, Asset Condition Project, and Capital and Operational Priorities

The Asset Condition project builds forms in CityWorks that Operations staff can use to collect condition information during routine facility visits and inspections. A pilot involving four asset classes (water reservoirs, water supply plants, wastewater/stormwater structures, and wastewater treatment facilities) was carried out during fiscal 2022/23. During the pilot, the project team adjusted the activities due to the following constraints:

- *Water reservoirs* – progress was deferred due to delays in the ongoing GIS data model build for water structures project; this asset class will be re-evaluated for a future phase once the GIS data model work is complete.

- *Wastewater/stormwater structures* – operational challenges (excessive efforts related to weather events) and resource constraints impeded the ability to advance the asset condition project pilot; this asset class will be revisited in future.

The work undertaken for the water supply plants and wastewater treatment facilities pilots was successfully completed. These groups embraced the ability to make use of regular inspection and facility visits for collecting condition and operational information that will inform future capital investment needs. One limitation discovered is that these groups prefer to roll up the information to a sub-component level that has tentatively been labelled "system". However, this "system" level does not exist in the data hierarchy and a project to make the proposed changes in GIS must be completed to create a place to record the information. While that project is being scoped and resourced, the Asset Condition project team is continuing to develop the content necessary for the data collection forms.

Separate from but like the Asset Condition project, Operations staff have been performing maintenance inspections via CityWorks. As a result, 30 of 165 wastewater pumping stations have condition grades recorded using a simplified 1-3-5 scale equivalent to 1 = Very Good, 3 = Fair, and 5 = Very Poor that is aligned with the full condition scale. AM staff and Operations staff need to review the findings against the previous condition assessment conducted jointly by a consultant and Halifax Water staff and coordinate next steps.

2.6. CCTV Program

Halifax Water has a corporate sewer inspection program involving CCTV inspection of mainline and lateral pipes and scanning inspections of manholes. The program follows the National Association of Sewer System Companies (NASSCO) pipeline assessment certification program (PACP). Similar assessment certification programs exist for manholes (MACP) and laterals (LACP).

2.6.1. Progress Compared to Program Goals

Halifax Water's sewer inspection program is delivered partly with contracted resources and partly with in-house resources. Historically, the program has targeted a production rate of 60,000 metres annually. With the current contract, the service provider was encouraged to move Halifax Water to 100,000 metres annually in year two of the contract. The contract timing was impacted by the pandemic and the contract was in place mid-year (2021) which affected production

numbers in year one (2021 – partial year only) and year two (2022). However, production is up considerably as the third year (2023) of the contract proceeds.

As of September 5, 2023, staff have created 311 projects in the 2023/24 master inspection log. In comparison, 177 projects were set up in fiscal year 2022/23. To date, 26,744 metres of inspected sewers have been completed; there are 59,496 metres of planned CCTV lengths either in progress or awaiting sewer cleaning prior to inspection. These amounts are tracking to more than 86,240 metres of inspection for 2023/24. While production is up from the previous year, it is unlikely the 100,000 metre aspirational goal will be achieved.

Several factors continue to influence production including availability of skilled resources (both contracted and internal staff), equipment availability, traffic control services constraints, need and availability of sewer cleaning resources, competing demands (resources reallocated to weather and environmental events and cleanup), and increased number of proactive inspection areas (typically in areas expected to have more defects and therefore influencing the time to collect, code, and quality control check the inspection information).

Some improvements Halifax Water has put in place include unifying the sewer inspection process (for both contracted and internal programs), assigning 20% effort to a technical resource in Operations to assist with quality control and quality assurance reviews of the inspections done by in-house teams, coordinating all inspection requests through the AM team including creation of cleaning work orders for Operational teams, and reviewing the data management practices between the AM team and GIS resources to streamline where possible.

2.6.2. Reinforced Concrete Pipe

Approximately 59% of the gravity sewer pipe inventory is identified in Halifax Water's GIS as concrete pipe. The proportion of the concrete pipe that is reinforced concrete compared to unreinforced concrete continues to be a focus for staff to determine. If 59% of the gravity sewer inventory is concrete with an unknown proportion being unreinforced concrete, the risk to the utility for pipe failure may be elevated. Efforts to find insights from previous records either directly related to the sewers or adjacent infrastructure in the corridor have been exhausted.

Industry Outreach

Staff reached out to colleagues at Shaw Precast Solutions, the local supplier of concrete pipe, manholes and other structures. From the information shared by Shaw, pipes larger than 375mm have always been reinforced. Around 1987 or 1988 all concrete pipe was reinforced (all sizes). Prior to that, there may have been some smaller diameter pipes (200mm, 250mm, 300mm, and 375mm only) that were unreinforced concrete. These would be recognizable by the relatively short pipe segments (length of 1500mm), and often characterized by a ribbed-style profile created from the equipment and process used to manufacture the pipe.

Applying this information, staff updated the dataset to determine the proportion of reinforced to unreinforced concrete pipes. The results indicated that up to approximately 46% of the

concrete gravity sewers are unreinforced concrete. **Error! Reference source not found.** illustrates the parameters defining the presence of reinforcement in the concrete pipes.

Table 10 – Reinforced Concrete Parameters Based on Industry Outreach

Reinforced Concrete	Description	Length (m) of Gravity Sewer [1]	% of Concrete Gravity Sewer [2]
No	≤375mm diameter installed before 1987	583,479	45
Yes	≤375mm diameter installed after 1986	354,492	28
Yes	Larger than 375mm	302,329	24
Yes	Already identified as reinforced concrete in GIS	28,133	2
Unknown	No install date available	17,982	1
Total		**1,286,415**	**100**

1. Rounded.
2. Unreinforced concrete assumed to include column 1 descriptions of "No" (45%) and "Unknown" (1%).

2.6.3. Update of CCTV Prioritization Model

The industry information has been applied to the original model developed for the CCTV Prioritization Model. Unreinforced concrete is deemed to be like asbestos cement in terms of ESL (75 years) and reinforced concrete is expected to last longer therefore, the ESL has been adjusted to 80 years. Staff will work with the GIS team to get the adjustments made in the corporate dataset with an emphasis on the feature code (FCODE) and pipe material fields. Additionally, the CCTV Prioritization Model script was adjusted and rerun as follows:

- Concrete material adjusted to read "Reinforced Concrete"
- Asbestos Cement adjusted to read "Asbestos Cement / Unreinforced Concrete"
- ESL for "Reinforced Concrete" adjusted to 80 years
- Script was rerun to produce an updated priority list and polygons

From the CCTV Inspection Program Optimization guide, risk scores comprised of a likelihood of failure (LOF) factor and a consequence of failure (COF) factor. The LOF factor is determined from a weighted average of the condition score, soil type score, and material type score using the formula:

*Overall LOF = (Condition LOF) * 0.6 + (Soil Type LOF) * 0.1 + (Material Type LOF) * 0.3*

Where Condition LOF is a function of age and ESL, Soil Type LOF is a function of drainage ability, and Material Type LOF is a direct function of the pipe material. There is no anticipated change related to the soil type. The Condition LOF is determine in one of two ways.

If there is a CCTV inspection available, then:

*CCTV Condition Grade = (Structural PACP) * 0.75 + (Operational PACP) * 0.25*

If using age and ESL, then:

Age & ESL Condition Grade = 1 – (Age/ESL)

The CCTV Inspection Program Optimization model is applied to prioritize where the greatest need for sewer inspections exists. Since those priorities are typically in locations that do not have a recent CCTV inspection, the Age & ESL condition grade score is more likely to influence the overall score. With the redistribution of the concrete pipe into reinforced concrete pipe representing approximately 54% of the concrete pipe inventory and an adjusted ESL of 80 years and the remaining 46% assigned as unreinforced concrete and retaining the 75 years ESL, the Condition LOF can be updated.

For the Material Type LOF, the proportion of unreinforced concrete (46%) has been downgraded to a score of 9.

The update to the algorithm is based on using the newer GIS pipe dataset. Therefore, in addition to the changes in material for the proportion of reinforced to unreinforced concrete, some areas also had updated material based on other activities (e.g., renewals or minor repairs since the first run, new assets added which would reduce the average age in an area). The outputs are shown in Figure 7 (original result 2020) and Figure 8 (updated result 2023).

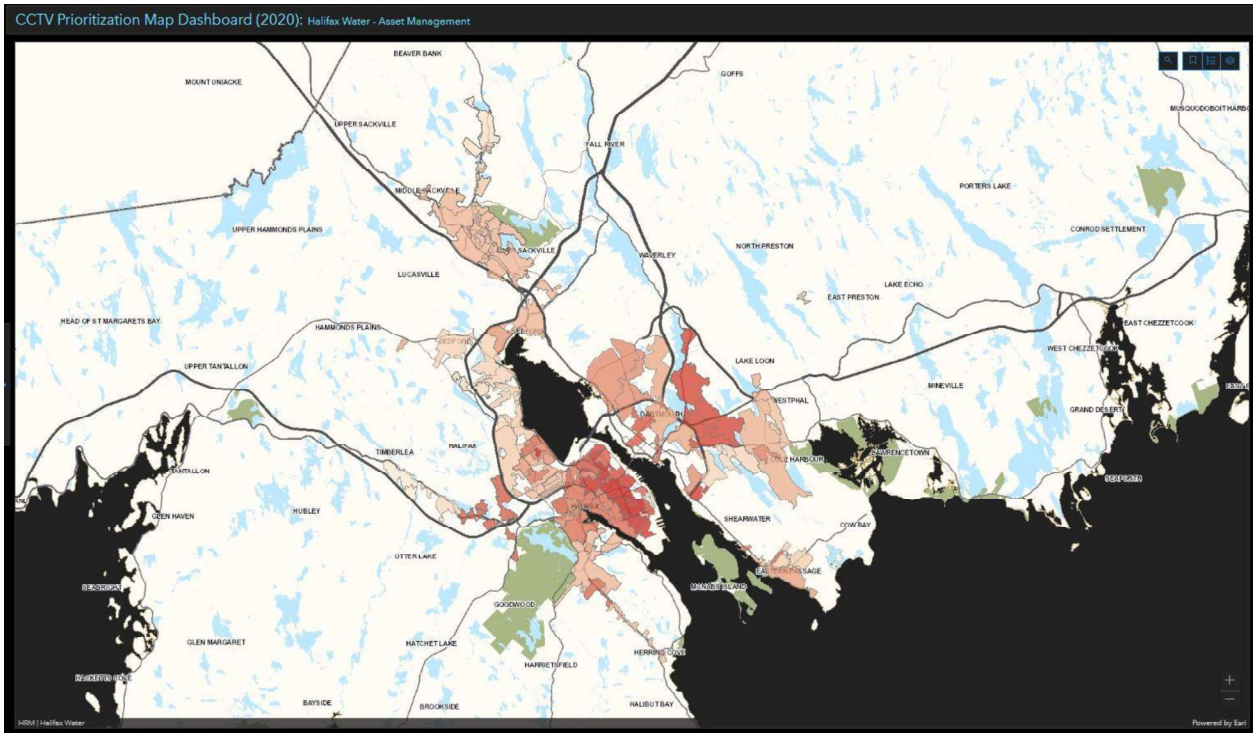


Figure 7 – CCTV Prioritization Tool Polygons – 2020

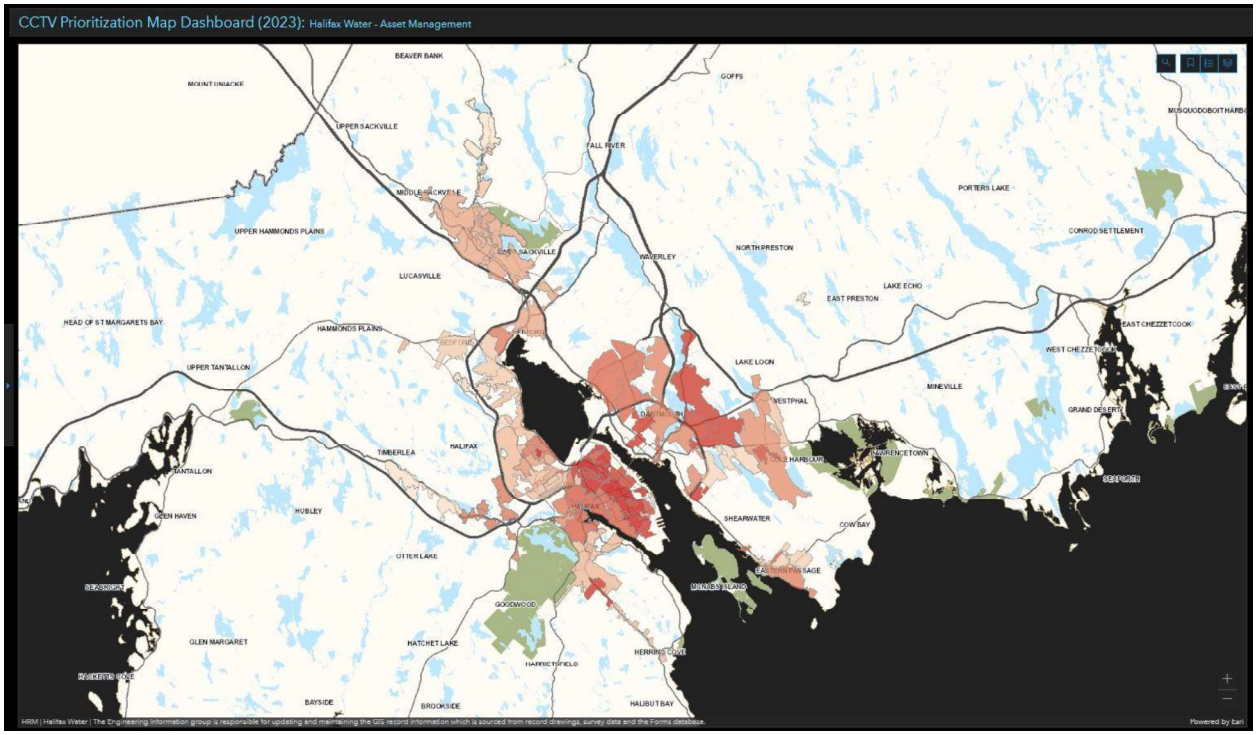


Figure 8 – CCTV Prioritization Polygons – 2023

Limited output changes were anticipated and have been confirmed based on the above two figures. The algorithm result illustrates the sensitivity of the ESL and material factors. The pipes affected by the change are expected to be distributed throughout the network and priority polygons. Many of the priority polygons already have asbestos cement or concrete pipes, therefore, the change is not significant.

2.6.4. Proposed Research Project

With the application of the information received from the industry outreach, and nearly half of the concrete pipe deemed to be unreinforced, efforts to investigate ways to verify the presence of reinforcement continue. Staff are exploring the opportunity to work with one of the local colleges or universities to identify *in-situ* options for locating reinforcement elements in a cost-effective, practical application.

Two potential research project options are being considered (subject to the availability of resources, capacity relative to other priorities, and interest of academic partners):

- *Predictive Data Analysis –* Using available record drawings and GIS information, develop an artificial intelligence (AI) algorithm aimed at extracting relevant asset attributes (e.g., age, material, diameter, install date, pipe class). The algorithm should help Halifax Water differentiate concrete pipe materials that are more likely to be reinforced concrete.

- *Technology Options Analysis –* Investigate available technologies that are capable of *in-situ* determination of the presence of rebar. Technologies can be capable of combining with conventional sewer inspection tools (e.g., CCTV cameras), or can be stand-alone but spatially aligned. The analysis must consider as a minimum, practicality of use, skills and training requirements, accuracy, post-processing effort, all-inclusive cost per metre to deploy, speed of application, and impacts of combining with conventional sewer inspection techniques (pace of inspection, conflict with CCTV equipment, etc).

2.7. Program Success

Accomplishments from the program over the past year include:

- Completed the development of the AM Strategy
- Migrating to the PSD Citywide solution (first phase)
- Published the 2022/23 AM statistics (poster) using Citywide solution
- Unification of the sewer inspection program process
- Recruitment process initiated

2.8. Next Priorities

With the addition of resources to the team in Q3 of 2023/24, AM Program activities will be reassessed and prioritized. Immediate priorities are expected to include onboarding the new AM resources and reviewing and confirming the work plan with a preliminary focus on:

- Asset criticality identification and condition assessment program (all asset classes).
- AM culture, communications, and change management.
- Aligning levels of service and Halifax Water business plan objectives.
- Reviewing processes used to identify and evaluate capital renewal priorities and support investment decisions.

3. Wet Weather Management Program

The requirement for Halifax Water to report on the advancement of the Wet Weather Management Program (WWMP) originates within NSUARB decisions (M09201, M09592, M09494, M10188). The following summarizes Halifax Water's efforts to reduce inflow and infiltration (I/I) originating on the private side (customer's connections).

3.1 Private Side Pilot Project

In 2019, the Hornes Road area in Eastern Passage was chosen by the WWMP for a private side pilot project with the intent to identify non-compliant service connections to the Halifax Water systems. The financial burden to remediate the service connection lies with the customer.

Beginning in 2021, the Halifax Water staff of Regulatory Compliance Services commenced private property inspections. 96 private properties were inspected, of which 20 were found to have stormwater sources connected to the wastewater system. The 20 properties included a total of

24 violations. Halifax Water's submission last year to the NSUARB incorrectly stated the number of properties as 22.

Staff intended to use corporate flow monitor data to develop a correlation between estimated costs for inspection, customer compliance and flow reduction. Given the issues with the availability of the flow monitoring data, this correlation is not available at this time.

3.1.1. Downspout Disconnection Program

The Downspout Disconnection Program is integrated with the Sewer Separation Program as a method to remove private downspout stormwater flows from newly separated wastewater systems. Regulatory Compliance Services and Engineering & Technology Services staff meet regularly to discuss the joint coordination of the two programs. Meetings are held at project initiation, design and construction phases. Communication to private property owners provides project updates and educational information pertaining to the customer's requirement to disconnect downspouts.

From 2021 to present, the areas with active Downspout Disconnection Programs include:

- Federal Avenue, Romans Avenue, Bayers Road, Chisholm Avenue and Micmac Street (this is a continuation of previous sewer separation project areas)
- South Park Street and University Avenue
- Wyse Road and Jamieson Avenue
- Maynard Lake and Clement Street Wetland Separation

Details of the status of these downspout disconnection areas are discussed below.

3.1.1.1. Federal/Romans, Bayers, Chisholm/Micmac Project Area

Halifax Water completed the construction of the Federal/Romans Avenue and the Bayers Road Sewer Separation (Phase 2) projects. The Downspout Disconnection Program for these projects commenced in 2020 and is now completed.

Within the two project areas, 16 downspouts remain which require disconnection. This represents less than 5% of the 347 downspouts contained in the project areas. Halifax Water is coordinating acceptable remediation with the remaining noncompliant properties.

3.1.1.2. South Park Street and University Avenue Area

The South Park Street and Cathedral Drive Sewer Separation project (M09808) was divided into two phases of work. Phase 1, which is now complete, consisted of a portion of South Park Street and the intersection of University Avenue. Phase 2 will continue from the intersection of University Avenue and extend along Cathedral Drive.

The customer infrastructure assessments were conducted for nine properties in March 2020. The properties included eight residential dwellings and one institutional building. All nine were

identified as having downspouts connected to the newly separated wastewater system. In September 2022 each customer received a personalized letter identifying their need to disconnect downspouts within 30 days. The property and violation information breakdowns are provided below:

Table 11 – Downspout Disconnection Program South Park St and University Ave

Total properties	9
Properties without connected downspouts	0
Properties with connected downspouts	9
- Properties exempted from disconnection[1]	8
- Properties with corrected violations	1
- Properties with outstanding violations	0

1. All downspout disconnection exemptions are pending future stormwater service connection availability.

The institutional building had an existing private stormwater lateral which was redirected to the new dedicated stormwater system. Through customer discussions after notification, it was determined the residential properties did not have sufficient pervious area to discharge stormwater to without creating additional stormwater issues for the customers. In order to properly manage the issue, each property requires their own stormwater service connection. However, the scope and budget had already been set for the separation project and construction was underway.

This project identified the requirement of Regulatory Compliance Services and Engineering & Technology Services staff to identify properties that require stormwater service connections earlier in the capital project planning process to make downspout to disconnection feasible.

Phase 2 of the Cathedral Drive Sewer Separation project will be constructed in 2024.

3.1.1.3. Wyse Road and Jamieson Street Area

The Albro Lakes and Wyse Road Sewer Separation project consists of two phases of work. Phase 1 (M10271), which is now complete, included a harbour outfall and dedicated stormwater main within Jamieson Street through intersections of Windmill and Wyse Roads up to Cairn and Graham Streets. The construction activities in Phase 1 are complete.

The customer infrastructure assessments were conducted for 18 properties in March 2023. Halifax Water's submission last year to the NSUARB incorrectly stated the number of properties as 19. One of the properties was removed after assessing it receives service from Brookside Avenue which was not in the scope of this project. Of the 18 properties, five were identified as having downspouts connected to the wastewater system.

In June 2023 each customer received a personalized letter identifying their need to disconnect downspouts within 30 days. The property and violation information breakdowns are provided below:

Table 12 – Downspout Disconnection Program Wyse Rd and Jamieson St

Total properties	18
Properties without connected downspouts	13
Properties with connected downspouts	5
- Properties exempted from disconnection[1 2]	1
- Properties with corrected violations	1
- Properties with outstanding violations[3]	3

1. One property was permitted to remain connected to wastewater system due to constructability constraints.
2. All downspout disconnections exemptions are pending future stormwater connection.
3. Two of the properties with outstanding violations could not proceed with downspout disconnection given that it would worsen an existing property flooding condition. Halifax Water is scoping the installation of a public catch basin within an adjacent service easement to facilitate downspout disconnection.

3.1.1.4. Maynard Lake and Clement Street Wetland Separation

The Maynard Lake and Clement Street Wetland Separation is a future capital project that will be assessed to include a downspout disconnection program. Approximately 93 properties are within the project area. Regulatory Compliance Services has conducted a desktop review of all properties, as well as a property owner survey, and determined a number of properties that may require a new stormwater service connection be installed as part of the capital project. This data has been provided to the Infrastructure Planning group within Engineering & Technology Services for potential inclusion in the scope of the project.

3.1.2. Campus Property Program

Regulatory Compliance Services took a pilot project approach which focused on the Roaches Pond sewershed, identifying 13 campus properties. These campus properties provided sufficient variety of differing rainfall responses.

The Campus Property Pilot Project had two main objectives. The first objective was to confirm how Halifax Water defines a campus property. Campus properties are anticipated to have a greater risk of non-compliance and a sub-set of Institutional/Commercial/Industrial (ICI) and multi-unit residential properties. The assessment process involved reviewing available records, conducting site visits, and performing flow monitoring or wet/dry manhole checks. Initially, staff reviewed properties with a minimum of 100 metres of private piping and 13 properties were identified to be potential campus properties based on that criteria (see Table 13).

As staff worked through the 13 properties, it was determined that I/I risk was related more to the number of connection points within the private system and the age of the pipe rather than the length of private pipe. It was also determined to focus on properties 20 years or older at this stage.

Using these new criteria (i.e., connection point and age), eleven of the properties were rated as having no identified risk for I/I and were removed from the pilot, while two were identified as having high risk. The two that remained included a land leased community and a townhouse complex, with the latter showing the presence of I/I. This resulted in a campus property being redefined as those with 10 or more connections.

Table 13 – Campus Pilot Project Locations

Street Name	Property Type	Status
1 Cranberry Court	Townhouses	
66 Rockingstone Road	Public School	
1 Regan Drive	Public School	
16 Sussex Street	Community Centre	
Bridget Avenue (Multiple Civics)	Mobile Home Park	
138 Drysdale Road	Public School	
10 Foxwood Terrace	Multi-Res-High-rise	
11 Drysdale Road	Skating Rink	
16 Dentith Road	Shopping Centre	
279 Herring Cove Road	Grocery/Gas	
Torpedo Lane (Multiple Civics)	Townhouses	
103 Alabaster Way	Multi-Res-High-rise	
301 Alabaster Way	Multi-Res-High-rise	

The second objective of the Campus Property Pilot Project was to develop an effective method of targeting, evaluating, and removing I/I. The Roaches Pond sewershed area exhibits high flows during wet weather and represents a variety of properties.

Challenges were experienced in obtaining the private side infrastructure record drawings and infrastructure limitations related to the opportunity to flow monitor and inspect on the private side.

The Campus Property Pilot Project achieved its objectives of defining parameters of a campus property as well as developing an effective method for addressing I/I on campus properties. The new Campus Property Program approach will allow for a focus on high-risk private source I/I contributions within the sewersheds targeted for RDII reduction.

However, to address these challenges, a campus property program method requires the creation of a campus property database, private-side record information, site assessment by Regulatory Compliance Services, and creation of a compliance agreement. As identified in our previous submission, we propose to engage stakeholders (such as Building Owners and Managers Association and Investment Property Owners Association of Nova Scotia) on advancing this program to gain feedback on addressing the implementation of future investigations and compliance initiatives.

3.1.3. New Service Account Compliance Program

Regulatory Compliance Services has completed a review of the New Service Account Compliance proposed program and is currently in a scoping exercise to review resources, required legislation and integration with Halifax Water's Enterprise Resource Planning required for program delivery. Stakeholder engagement will be conducted in 2024 with an anticipated program rollout in 2025.

3.1.4. Overall Private Side I/I Program Review

Halifax Water hosted an internal workshop in Q3 of 2022/2023. Halifax Water continues to assess the Private Side I/I program, and the resources required for implementation. A workshop with Board consultants will be scheduled to review the WWMP and private side I/I programming, at which feedback will be sought to inform future planning.

3.2. Jurisdictional Hurdles

Halifax Water continues to collaborate with HALIFAX on joint stormwater related initiatives, the updated Stormwater Infrastructure Cost Sharing MOU was approved by the NSUARB on October 13, 2022. Halifax Water will monitor this MOU to ensure that it remains relevant to both entities. Any significant changes will be presented to the Board for review and approval.

3.3. Wastewater System Hydraulic Modelling

As part of the 2019 IMP, Halifax Water developed an all-pipe hydraulic model using Innovyze InfoWorks ICM software. The model represents the "core" system. This is the network servicing the following WWTFs:

- Halifax
- Dartmouth
- Herring Cove
- Lakeside/Timberlea
- Springfield Lake
- Mill Cove
- Eastern Passage

The Halifax Water model was developed with the goal to transition it into the digital twin concept following completion of the Infrastructure Master Plan (IMP). To use the model for the development of the master plan strategy, the model build followed a hybrid strategy where traditional methods of data import were used with decisions made to facilitate future linking to 'live' corporate data.

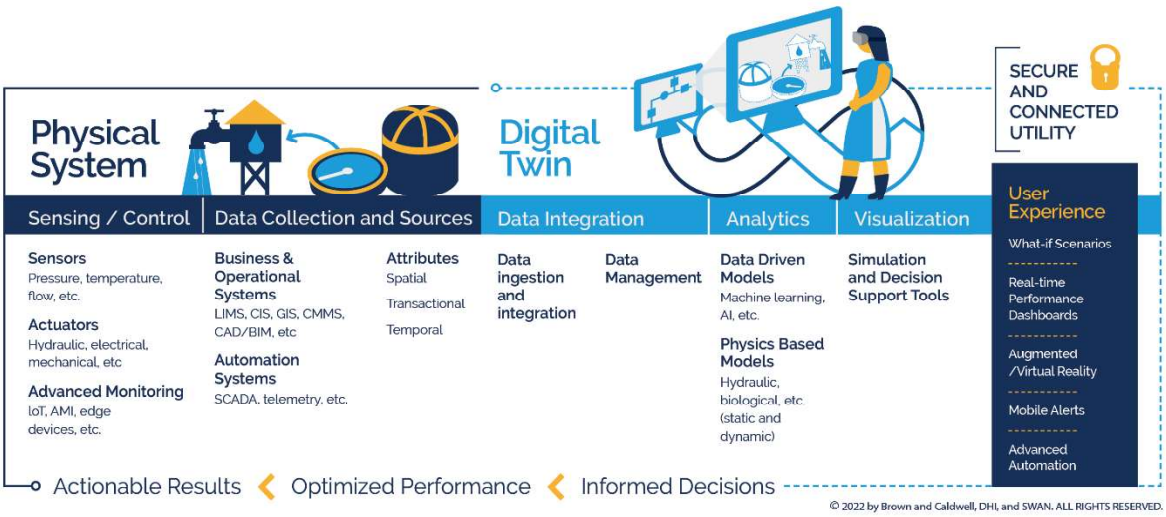


Figure 9 – Example Digital Twin Architecture

The corporate flow monitoring program is one of the data keystones for the hydraulic model. In-system flow monitoring was combined with SCADA (supervisory control and data acquisition) and operational information in the creation of the model. Since the model creation, Halifax Water has been working to strengthen the "data integration" link shown in Figure 9. What was largely a manual process to export sensor information from one system and import it to the model is becoming an automated process.

The regional wastewater system model, corporate flow monitoring program as well as the regional potable water system model are managed and maintained by Halifax Water's Data Engineering team within the Asset Management and Capital Planning team.

3.3.1. 2022/23 Sewer Model Activities

In July 2021, Halifax Water began a three-year flow monitoring contract with ADS Environmental Technologies (ADS) to provide gravity sewer flow monitoring, rain gauging, and calculated sewershed statistics for the Corporate Flow Monitoring Program. The contract has various requirements for data format and delivery timelines based on experiences with the previous contract from 2016 to 2021. ADS was unable to meet many of these requirements resulting in Halifax Water taking on work that should be completed by the contractor, building tools and processes to work around the ADS limitations, and relaxing delivery timelines.

While this has resulted in internal resources spending more time on the flow monitoring program as opposed to new initiatives; tools, processes, and knowledge acquired by staff in this area will be transferable and applicable in future iterations of the program.

As an example, an important function in a digital twin is the "extract, transform, and load" (ETL) workflow needed to run the hydraulic simulation. Data must be extracted from multiple sources, transformed to a format that the model software can ingest and then loaded to the model. In

traditional modelling, this workflow is conducted by a junior member of the team using Excel and copy/paste. It is a tedious process that is susceptible to human error.

The flow monitoring contract envisioned monthly delivery of finalized (quality assurance/quality control (QA/QC) checked) flow monitoring data in a single comma separated value (csv) data format for ingestion into Halifax Water's SQL flow monitoring database. Halifax Water staff developed a python tool to bulk download precipitation and flow data directly from ADS using their "application programming interface" (API). This python tool is based on open-source software tools and are robust to changes in monitoring vendors and modelling software. At the same time, Halifax Water took the opportunity to develop a similar tool to extract Canadian Hydrographic Service water level and tide forecast data for Halifax Harbour.

The development of the hydraulic model into a digital twin will require a robust set of tools and skills in the ETL (data) pipeline to run model simulations as well as disseminate simulation results. Although this is not an area staff had planned to focus on this year, the work would have been needed within the next few years, so it is not a wasted effort.

Halifax Water uses the Halifax and Dartmouth hydraulic models to generate annual combined sewer overflow (CSO) volumes and frequencies for the annual Wastewater System Effluent Regulations (WSER) report in February. This simulation is based on precipitation measured by the network of tipping bucket rain gauges maintained through the flow monitoring program. When preparing the model run for 2022, it was noted that substantial quantities of data had not been collected at various times and different locations in the network during 2022.

The extent of this issue had not been apparent to Halifax Water because of the difficulty ADS had in providing the bulk data exports and this was the first opportunity where Halifax Water's bulk data extraction tool was used. Halifax Water was able to run the simulations by adjusting the rain gauge boundaries in the model and substituting in data from adjacent gauges as required. This is a largely manual, time-consuming task and staff have established methods to avoid having to complete manual updates. In the current contract, the need to perform the manual adjustments is more common than staff anticipated.

The corporate flow monitoring program requires redundant gauges and data loggers at each rain gauge station. Unfortunately, certain data data was lost, however more frequent maintenance visits by the contractor reduced the data loss. The loss of data emphasized the importance of high data uptime at rain gauge sites. Uptime and reliability of data telemetry will be two focus areas in the next flow monitoring request for proposals (RFP).

The annual WSER CSO overflow simulations have been run to determine CSO volumes occurring from precipitation events. If additional overflows occur during the year as the result of mechanical or electrical failure, the regulatory reporting staff have historically used reports from operations to manually include those overflows in the report. The Duffus pumping station suffered a mechanical failure in July of 2022. This was the first time that the modelling team has explicitly included a mechanical failure in the model simulation run to include the resulting

overflow. Sometimes adding this sort of manual override to a model can result in unexpected model instability causing the simulation to fail. Including the Duffus failure into the model worked well with no model instability issues. Halifax Water now has a process and proof of concept for how to include mechanical failures into the hindcast regulatory reporting capabilities of the model. This was an important milestone as the use of the model as a tool for CSO/SSO (sanitary sewer overflow) reporting is anticipated to evolve and expand through the SSO and CSO Management Program.

In 2022/2023 the hydraulic model continues to be used for a variety of capital planning and design projects. These locally specific investigations typically involve an evaluation of the local calibration and recalibration of the project area based on the specific needs of the project. Of note this year was the work completed to evaluate potential gravity options to eliminate the Allison Drive Pump Station.

3.3.2. Annual Model Calibration Validation Report

Halifax Water has completed an annual model calibration validation report for data collected in 2022. The purpose of this annual report is to compare calibration of the regional model to flows observed by the corporate flow monitoring program. Where significant deviations from the calibration are noted, Halifax Water may recalibrate. A comprehensive recalibration of the model will occur on a five-year cycle to coincide with the Integrated Resource Plan.

While working to complete the first calibration validation report last year, Halifax Water identified challenges associated with the ability of the existing templates, based in Microsoft Excel, to manipulate and analyze large datasets. As such, Halifax Water staff has taken steps to reduce the manual effort involved in using the templates and automated much of the process.

The Halifax Water models are calibrated using 84 flow monitoring zones. The observed flow monitoring data for 2022 contains 2,628,000 measurements for each site and for each of: flow, velocity, and depth. This represents potentially over 550 million discrete data points. The observed data input file is a comma separated value (csv) approximately 680Mb in size. The model results files needed to evaluate the wet weather calibration over five critical events constitutes 165 csv files totaling approximately 45 Mb of data.

Halifax Water staff developed model validation scripts in Python to automate the generation of the wet and dry weather tables and graphs recommended in the “Annual Model Calibration and Reporting Technical Memorandum” which generally follows the latest “Urban Drainage Group (UDG) Code of Practice for the Hydraulic Modelling of Urban Drainage Systems”.

As Halifax Water evolves its modelling practices to align with the principles of the digital twin, one of the purposes of the calibration verification report is to increase confidence in the model as a tool that can be used to provide operational decision support. It will also provide a quality assurance/quality control opportunity to review if other changes in the underlying model assumptions have impacted the model calibration.

Building the automation tools this year represented a significant level of effort but has resulted in a toolset that shortens the workflow for future iterations. It used to take weeks of copying and pasting once the model simulations had completed to generate the 588 associated graphs and table entries. Using the automation tools, it takes well under an hour and greatly reduces the possibility of human error.

In future years, it is envisioned that a modeller will look at the graphs and statistics for each site and event and provide input on the suitability of the model calibration. This modeller's discretion is the final step in the validation process that is recommended in the reporting guidelines. In future years staff anticipate completing this work at the same time as the WSER CSO volume reports are generated to provide a model confidence indication as that report is prepared.

This year, staff have not had the opportunity to evaluate each location but can offer the following general commentary on the model calibration.

A full model recalibration of all zones is part of the refresh planned with each revision of the IRP. As the full refresh is planned to begin this year (2023/24 fiscal), Halifax Water is not planning to recalibrate any individual zones based on this analysis.

Generally, the wet weather event calibrations remained accurate as shown in the FG11, June 9th event.

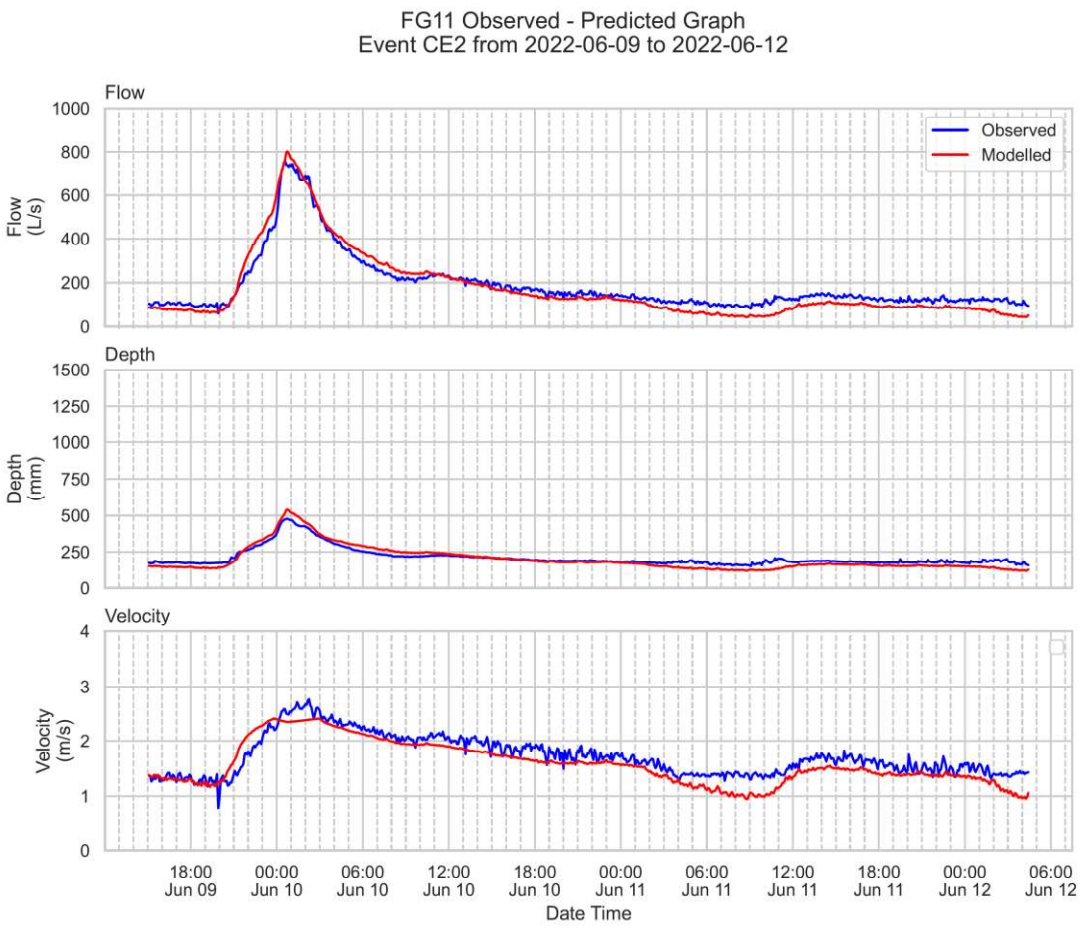


Figure 10 – FG11 June 9 Event

However, as this is meant to be an automated process the model runs do not attempt to substitute or reconstitute missing rain gauge data. This emphasizes the importance in minimizing the downtime at the rain gauges and is a key improvement expected in the next contract. Some sites are down at different times for construction activities, such as installation of solar panels at the Aerotech WWTF and painting at Akerley Reservoir. Unplanned rain gauge downtime will need to be monitored and tools to identify and substitute missing gauge data may need to be developed in the future. The figure for FG92, September 23rd event shows where the observed flow responds to a rainfall event that was missing from the model.

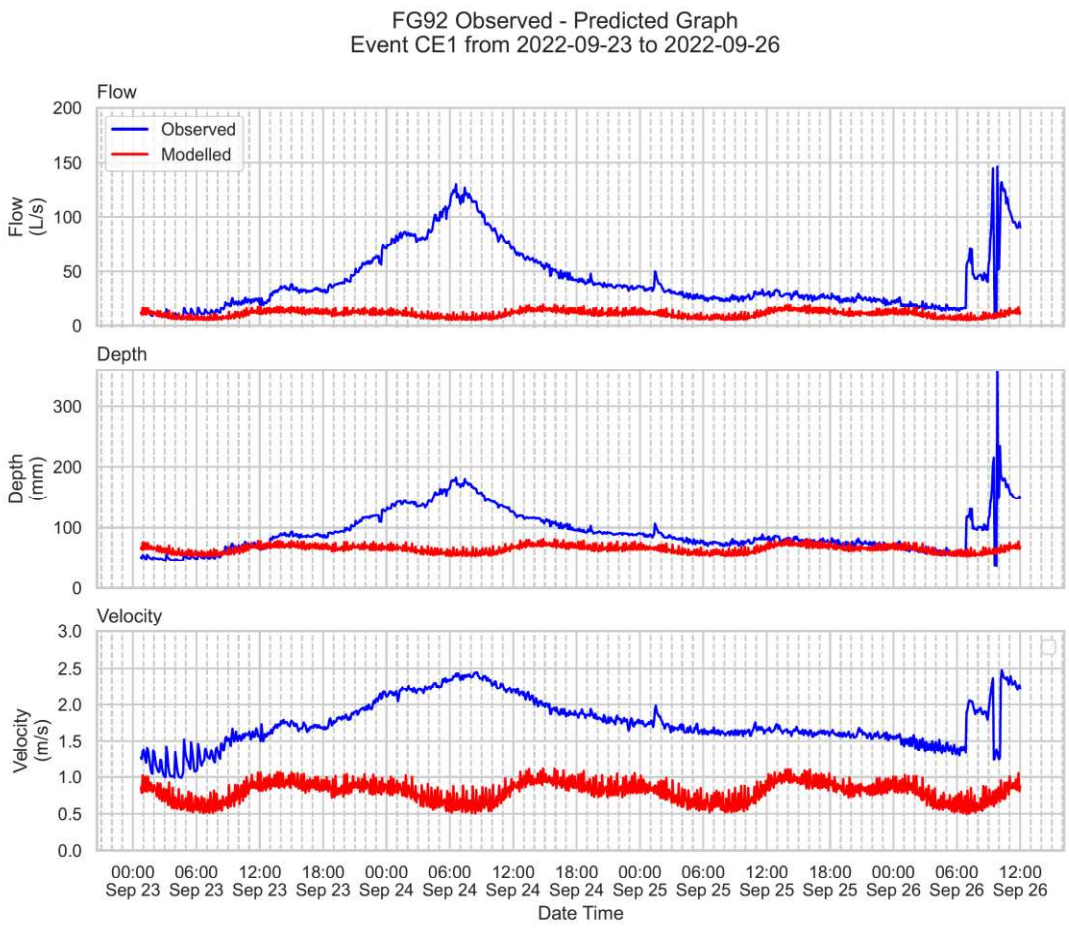


Figure 11 – FG92 September 23 Event

The model calibration can also be tricky to evaluate in combined systems where the peak responses can be much higher than the daily flows. When reviewing the calibration, the modeller should also consider the possibility of errors in the observed data. In the case of FG453 during the June 9th the peak flows are quite different. However, this seems driven by the apparent velocity pop. It is unlikely that the velocity in the pipe jumped to approximately 9 m/s.

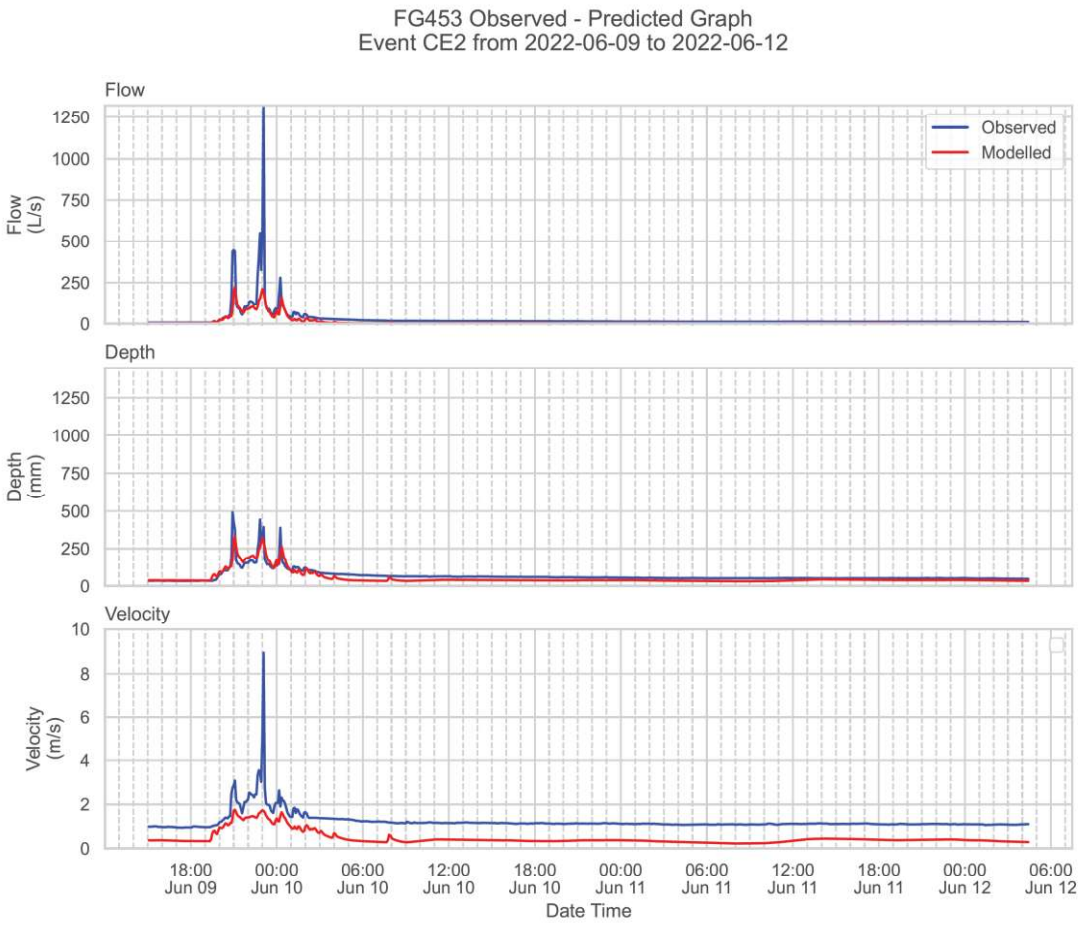


Figure 12 – FG453 June 9 Event

This is an example of where the calculated statistics would show a poor calibration based on the difference between the peaks, but the modeller should identify this as a good calibration.

Table 14 – Wet Weather Calibration Results Summary Excerpt (FG453)

Wet Weather Calibration Results Summary														
Flow Monitor	Pipe ID	FM Location	Critical Event #	Critical Event	Peak Observed Flow (L/s)	Peak Modelled Flow (L/s)	Peak Flow - % Diff.	Peak Observed Depth (m)	Peak Modelled Depth (m)	Peak Depth Diff. (m)	Observed Volume (m^3)	Modelled Volume (m^3)	% Volume Diff.	NSEC (%)
FG453	P5600	Manhole Inlet	CE1	2022-09-23	667.51	273.69	-59.0%	486.67	740.75	0.25	6583.20	4160.09	-36.8%	70.79
FG453	P5600	Manhole Inlet	CE2	2022-06-09	1317.61	221.51	-83.2%	491.21	332.49	-0.16	5560.58	2178.40	-60.8%	40.50
FG453	P5600	Manhole Inlet	CE3	2022-10-06	327.68	271.02	-17.3%	411.88	365.74	-0.05	6819.44	2591.23	-62.0%	60.96
FG453	P5600	Manhole Inlet	CE4	2022-04-19	174.13	99.81	-42.7%	209.38	200.57	-0.01	6926.94	2046.33	-70.5%	22.91
FG453	P5600	Manhole Inlet	CE5	2022-07-06	174.98	103.99	-40.6%	189.14	205.23	0.02	3020.07	1630.26	-46.0%	77.16

The dry weather evaluation template was originally designed to work with the calculated results product from the corporate flow monitoring program. One of those deliverables was to be a diurnal pattern calculated based on the dry days during the analysis month. The current flow monitoring contractor has not been able to provide that deliverable to date. Therefore, staff have explored some other ways to evaluate the dry weather model calibration.

Halifax Water used an automated process to identify all the 'dry' days for 2022. This was based on no rain on the day or for 2 days prior. The hourly modelled dry weather flow was plotted against a box plot of the hourly average from all 'dry' days. This shows how the modelled flow compares with the mean and quantiles of the observed data.

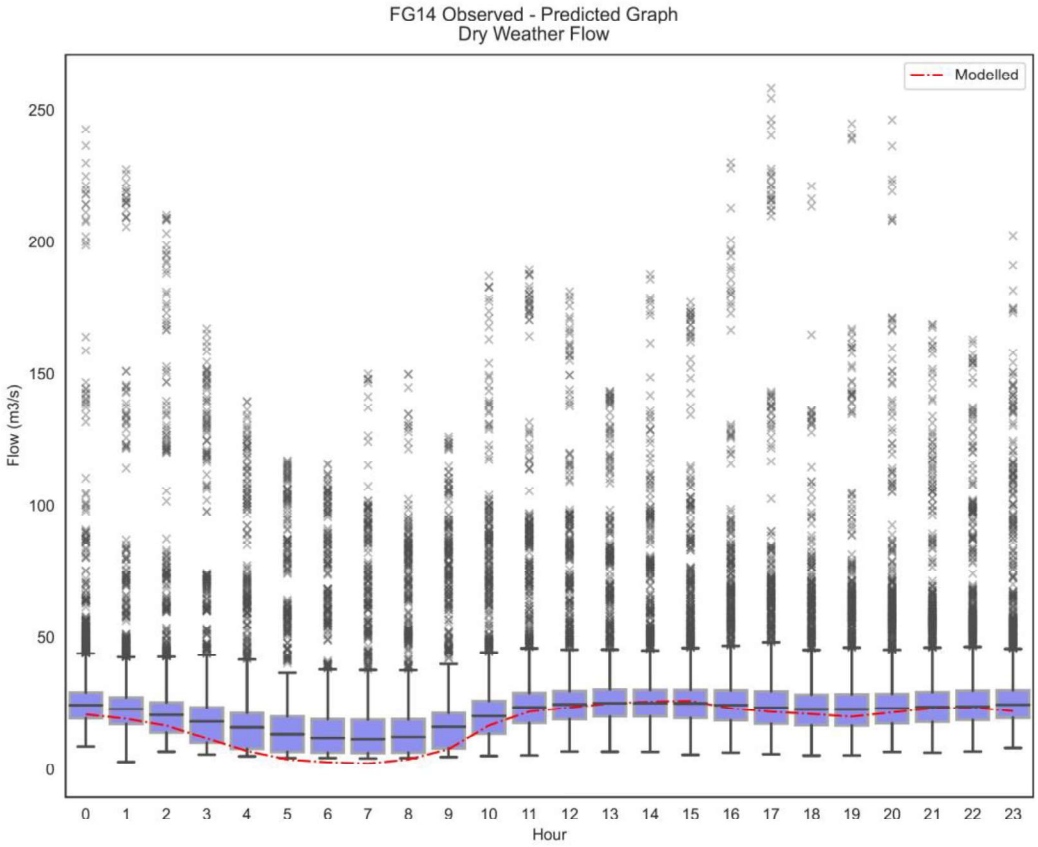


Figure 13 – FG14 Dry Weather Flow

Despite the selection criteria used to identify dry days, many of the plots have outliers that are quite a bit higher than the average. The outliers trend higher than the average because it is not (usually) possible to have a negative flow. Therefore, the distribution of the data is skewed and may be falsely skewing the average dry weather flow higher than where modelling judgement would expect the model calibration to be. The process that was used when the model was calibrated relied more on the modeller manually choosing representative dry days; these sorts of outliers were excluded from the calibration.

This is consistent with what staff see in many of the graphs where the modelled dry weather flow is on the lower side of the observed box plot. Halifax Water will continue to evaluate processes to identify what dry weather information to include in the validation. This could include exclusion of outliers in calculating the observed mean or manually reviewing the dry days to eliminate days that are not typical or representative.

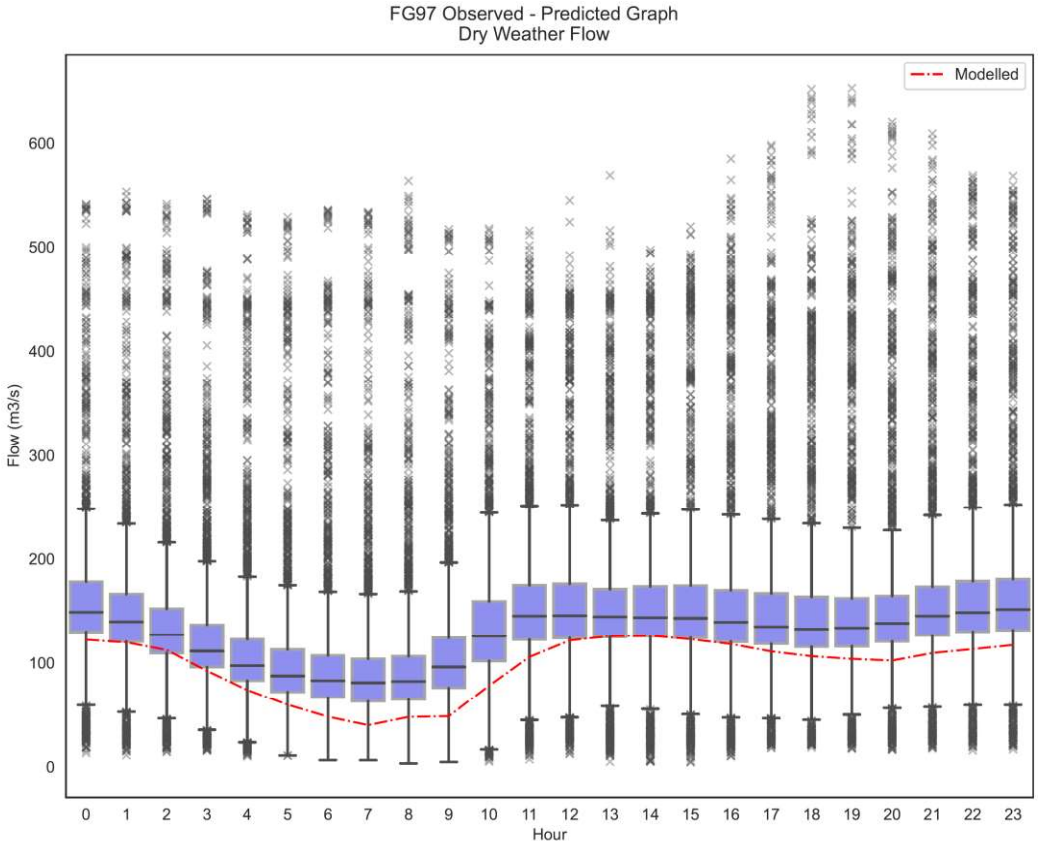


Figure 14 – FG97 Dry Weather Flow

Another factor potentially impacting the flow calibration in the model is the model validation being conducted with data collected by a different vendor than the original calibration data. In conversations with several peer agencies recently, they have noted that a change in data source has impacted the model calibration. This can be caused by the different equipment used and/or the approach the contractors take to calibrating their equipment. Some may calibrate for accuracy on the high flow peaks while others can tend to match for the average or daily. The general review of this validation is not definitive that this has impacted the Halifax Water model, but it is a factor to be aware of during the next model calibration.

This exercise has shown that the model is generally still well calibrated since it was originally developed. The proposed cycle of annual validations with full re-calibration on the same five-year cycle as the IRP is a balanced approach to model maintenance. Tools and experience gained in the past year will also be critical in model maintenance and analysis of flow monitoring zone wide flow trend analysis.

4. Compliance Requirements

4.1. Overview

4.1.1. Wastewater Treatment

Halifax Water collaborated with Board Counsel Consultants to prepare a Terms of Reference and Scope of Work document for engineering services to deliver the Wastewater Treatment Facility Planning Study. A consultant has been engaged and the work is in progress. A meeting was held in July 2023 with the Board Counsel Consultants to discuss the project. Comments from the meeting will inform the final Phase 1 report which is expected to be complete in fall of 2023.

As per M10524, Halifax Water is proceeding with the Future Regulatory Scenarios Study. A consultant has been engaged and the work is in progress. The final report is expected to be complete in fall of 2023.

4.1.2. Combined and Sanitary Sewer Overflows

Parts of the Halifax Water wastewater collection system consist of combined sewer systems designed to collect stormwater runoff and wastewater. These systems are tributary to the Halifax Wastewater Treatment Facility and the Dartmouth Wastewater Treatment Facility. Within those systems, there are 27 combined sewer overflow (CSO) points which discharge excess wastewater flows during wet weather events. Other parts of the wastewater collection system consist of separate wastewater and stormwater pipes. Some parts of these systems may be subject to sanitary sewer overflows (SSOs) resulting from excess flow due to inflow and infiltration.

Halifax Water has identified that there are inconsistencies in the instrumentation, availability of data, and applicable methods to identify and calculate the required report information. Halifax Water has compiled an inventory of protentional CSO/SSO locations and recorded the known status of monitoring equipment and alert capabilities.

Halifax Water is preparing a draft charter to outline SSO and CSO management program requirements to consistently meet the enhanced regulatory reporting. Staff are exploring program delivery options beginning with engaging an external program manager. The draft charter will be validated once the project manager has been engaged.

This SSO and CSO Management Program is expected to be a multi-year initiative to understand the magnitude of overflow in Halifax Water's wastewater system, confirm regulatory reporting and operating requirements for SSO and CSO discharges, and develop and implement a plan for Halifax Water to meet those regulatory requirements.

It is anticipated that early activities of this program will include developing a strategy to consistently meet the reporting requirements and determining the appropriate combination of modelling, monitoring, or other technologies required. Once the monitoring strategy has been

defined, it will be possible to identify the instrumentation gaps and deployment needs. This approach and development of the larger program implementation will be delivered by the program manager.

4.1.3. Water

Halifax Water's new get the lead out program resulted in the removal of 150 private and 118 public lead service lines in the 2022/23 season.

System Assessment Reports for each drinking water system, except Bomont were submitted to Nova Scotia Environment and Climate Change. In coordination with NSECC, the Bomont report will be completed once the new plant has been operational for at least a year to provide data for reporting purposes.

Health Canada is currently updating guideline documents, which will be released for public comment, for several parameters including: turbidity, waterborne pathogens, premise plumbing and legionella, disinfection byproducts, arsenic, and iron. Halifax Water provided comments to Health Canada on proposed PFAS and Corrosion Control guidelines documents. Finalized versions will likely be published to the Canada Gazette in one to two years.

The outputs from the requirements related to water treatment will be considered in the Water Supply Enhancement Project as required as part of the Future Regulatory Study.

4.2. Current Activities

4.2.1. *Regulations Monitoring and Research*

Halifax Water actively participates in associations (i.e., American Water Works Association, Water Environment Foundation, Canadian Water Works Association, Water Research Foundation, the Alliance for Water Efficiency, the forWater Network, Canadian Water Network, Atlantic Canadian Water Works Association, Municipal Public Works Association of Nova Scotia) and committees with federal and provincial regulators where future changes to regulations and standards are reviewed and discussed. Participating in these associations and committees allows for planning and reacting to the changes and implementation of required programs, infrastructure upgrades and operational adjustments. Halifax Water also actively collaborates with Dalhousie University to conduct research on the impact of potential future regulatory changes including both addition of new contaminants as well as changes to maximum acceptable concentrations for existing contaminants.

As noted above, Halifax Water continues to carry out the Future Regulatory Scenarios Study filed with the Board in March of 2022 (M10524), which projects the final study to be completed and incorporated in the annual report filed next year. Halifax Water will continue to collaborate with Board Counsel Consultants in this regard.

4.3. Planned Activities

In addition to on-going monitoring and tracking of regulatory requirements, in advance of the next IRP update, Halifax Water is undertaking the following studies, as illustrated in the AM&IP workplan submitted to the Board in M10139:

- SSO Management Program (evolved into the SSO and CSO Management Program), currently underway – charter being drafted, resource engagement in progress
- WWTF Compliance Plan (now referred to as the WWTF Planning Study), in progress with completion of Phase 1 expected in fall of 2023.
- Future Regulatory Scenarios Study, in progress and expected to be complete in fall of 2023.

4.4. Impact on Capital Expenditures

The 2019 compliance plan provided details of the current operations of the WWTFs and WSPs and anticipated short-term and long-term capital needs to address any current and future compliance requirements. Since publishing the compliance plan and IRP, no changes in regulations have occurred and Halifax Water, through its participation in several committees, is not aware of any active initiatives to change the current regulations as they pertain to water and wastewater management. As directed by the Board in M10524, Halifax Water will continue to consider how capital planning and capital projects could be impacted by possible future regulations, and report to the Board with each related capital application as required.

Halifax Water is optimizing the long-term infrastructure planning process to consolidate the various master plans into a updated IRP. The IRP scope is presently being developed. It will incorporate the three drivers (growth, asset renewal, and compliance) and the associated plans (Infrastructure Master Plan, Asset Management, and Compliance Plan, respectively). The updated IRP will assist with integration of issues affecting capital expenditures.

Glossary of Terms

AC	asbestos cement
ADS	ADS Environmental Technologies
AI	artificial intelligence
AM	asset management
AMBC	Asset Management British Columbia
AMIT	asset management implementation team
AMOntario	Asset Management Ontario
AMP	asset management plan
AMRS	Asset Management Readiness Scale
AM-SK	Asset Management Saskatchewan
AO	Aesthetic objective
API	application programming interface
AWWA	American Water Works Association
CA	condition assessment
CCPIS	Canadian Core Public Infrastructure Survey
CCTV	closed circuit television
CIRC	Canadian Infrastructure Report Card
CNAM	Canadian Network of Asset Managers
CPIT	Capital Planning and Inventory Tool
COF	consequence of failure
CSP	corrugated steel pipe
CSO	combined sewer overflow
csv	comma separated value
DSR	dam safety review
DSS	decision support system
ECCC	Environment and Climate Change Canada
EDO	environmental discharge objective
EMS	Environmental Management System
ERA	environmental risk assessment
ERM	enterprise risk management
ESL	estimated service life
ETL	extract, transform, and load
EUL	estimated useful life (also referenced as effective useful life)
FCODE	feature code
FCM	Federation of Canadian Municipalities
FMZ	flow monitoring zone
GIS	geographic information system
GFMAM	The Global Forum on Maintenance & Asset Management
HALIFAX	Halifax Regional Municipality
HCB	High Class Bituminous
HW	Halifax Water
IAM	the Institute of Asset Management
IAMA	Infrastructure Asset Management Alberta
ICB	Intermediate Class Bituminous
ICI	industrial, commercial, institutional
I/I	inflow and infiltration

IMP	Infrastructure Master Plan
IPWEA	The Institute of Public Works Engineering Australasia
IRP	Integrated Resource Plan
IS	information system
ISO	the International Organization for Standardization
KM	kilometre
LACP	lateral assessment certification program
LCB	Low Class Bituminous
LOF	likelihood of failure
LOS	levels of service
MAC	maximum acceptable concentration
MACP	manhole assessment certification program
NASSCO	National Association of Sewer System Companies
NSAC	new service account compliance
NSECC	Nova Scotia Environment and Climate Change
NSUARB	Nova Scotia Utility and Review Board
PACP	pipeline assessment certification program
PCCP	pre-stressed concrete cylinder pipe
PSD	Public Sector Digest
QA	quality assurance
QC	quality control
QDMR	quality data management reporting
RDC	Regional Development Charge
RFP	request for proposals
SAMP	Strategic Asset Management Plan (also known as Asset Management Strategy)
SCADA	supervisory control and data acquisition
SQL	structured query language
SSES	sanitary sewer evaluation study
SSO	sanitary sewer overflow
SW	stormwater
UDG	Urban Drainage Group
VFD	variable frequency drive
WSER	wastewater system effluent regulations
WSP	water supply plant
WWMP	wet weather management program
WWTF	wastewater treatment facility