

The City of Saint John Shared Risk Plan

Actuarial Valuation as at January 1, 2022
for Funding Purposes

Report prepared in September 2022

Registration number: New Brunswick and Canada Revenue Agency #0269209

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Introduction

The City of Saint John Pension Plan (“Former CSJ Plan”) was converted to the City of Saint John Shared Risk Plan (“CSJ SRP Plan”) effective January 1, 2013.

This report was prepared for the CSJ SRP Plan Board of Trustees (“Trustees”), the Canada Revenue Agency (“CRA”) and the New Brunswick Superintendent of Pensions (“Superintendent”) for the following purposes:

- to document the results of the funding policy valuation, as required under subsection 100.61(1) of the New Brunswick *Pension Benefits Act* (“PBA”) and subsections 14(5) to 14(7) of Regulation 2012-75, and provide the related actuarial opinion;
- to document the results of the risk management procedures as required under paragraph 100.7(1)(e) of the PBA; and
- to document the results of a hypothetical wind-up valuation of the CSJ SRP Plan as required under the Canadian Institute of Actuaries Standards of Practice, and provide the related actuarial opinion.
- to document the results of a going-concern actuarial valuation required under paragraph 14(1) of the Regulations to the PBA in order to determine the maximum eligible employer contribution for the CSJ SRP Plan under paragraph 147.2(2) of the Income Tax Act (Canada) (“ITA”) and provide the related actuarial opinion.

The Board of Trustees is also seeking the approval of the Superintendent for the following items, as required under the PBA and Regulation:

- approval of the generational mortality table used in the funding policy valuation as required under sub-paragraph 14(7)(c)(ii) of Regulation 2012-75;
- approval of the asset liability model used, as described in Section 2, including the stochastic projection assumptions found under Appendix C, as required under subsection 15(1) of Regulation 2012-75; and
- approval of the economic assumptions used in the asset liability model, as described under Appendix C, as required under subsection 15(3) of Regulation 2012-75.

The Trustees for the CSJ SRP Plan retained the services of LifeWorks (Canada) Ltd. (“LifeWorks”) to prepare this report.

The last actuarial valuation report prepared for the CSJ SRP Plan was performed as at January 1, 2021, in accordance with the requirements of subsection 100.61(1) of the PBA.

The next actuarial valuation report for the CSJ SRP Plan will be due no later than one year following the effective date of this report.

Changes since last valuation

The hypothetical wind-up basis has been updated to reflect market conditions as at the valuation date.

Since the filing of last year's actuarial valuation report, the following amendments were filed with the Office of the Superintendent of Pensions and their impact, if any, is included in this valuation:

- Amendment 19, effective January 1, 2022, documents cost-of-living adjustments and a permanent benefit changes made to the unreduced early retirement provisions of the Plan for pension benefits accrued in the year 2020. The amendment is in accordance with Steps 1 to 5 under the heading "Other Actions" of Section VI – Funding Excess Utilization Plan of the Funding Policy.
- Following the adoption of Amendment 19 to implement Steps 1 to 5 under the heading "Other Actions" of Section VI – Funding Excess Utilization Plan of the Funding Policy, an amount of \$5.6M available for utilization under the Funding Policy was left and was allocated to the establishment of a reserve to cover the next 10 years of potential contingent indexing based on CPI in accordance with Step 6 under the heading "Other Actions" of Section VI – Funding Excess Utilization Plan of the Funding Policy. This allocation is included in the Funding Policy Actuarial Liabilities for this valuation, along with prior years' allocations with interest, minus any amount that may have been used to provide indexing based on CPI.

Subsequent Events

On March 11, 2020, the World Health Organization declared that COVID-19 was a pandemic. This public health response has caused significant economic and social disruptions worldwide. COVID-19 has resulted in higher deaths for the population in general as measured by public health officials. The effect of COVID-19 on the future mortality incidence for members of the Plan is unknown at this time and no adjustments to the mortality assumption have been made in this report. The effect on the Plan if any, will be recognized in the gains or losses of future reports as experience emerges.

The recommendations and opinions are given exclusively from a financial viewpoint. This valuation report does not constitute a legal opinion on the rights and duties of the Trustees or the members of the plan over the pension fund.

Actuarial valuation results are only estimates. Actuarial valuations are performed based on assumptions and methods that are in accordance with sound actuarial principles. Emerging experience differing from these assumptions will result in gains or losses, which may affect future open group funded ratios of the Plan and future risk management procedure results, which in turn will impact the types and timing of any actions to be taken by the Trustees in accordance with the Funding Policy. These gains and losses will be revealed in future actuarial valuations.

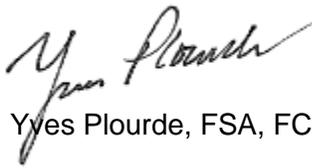
We are not aware of any subsequent event, other than those identified in this report, which would have a material impact on the results of the valuation.

Restriction on use of this report

This report was prepared for the Trustees. It will also be filed with the New Brunswick Office of the Superintendent of Pensions and the Canada Revenue Agency. This report and any of its content may not be distributed, published, made available or relied upon by any other person, without the express written permission of LifeWorks, unless and only to the extent otherwise provided by applicable law.

The undersigned are available to provide supplementary information and explanation, as appropriate, concerning this report.

Respectfully submitted,



Yves Plourde, FSA, FCIA

This report has been peer reviewed by Don Charlton, FSA, FCIA.

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September 2022

Section 1 – Funding Policy Valuation

A funding policy valuation is required annually under subsection 100.61(1) of the PBA and subsections 14(5) to 14(7) of Regulation 2012-75. The results of the funding policy valuation of the CSJ SRP Plan as at January 1, 2022 are found below.

The funding policy valuation results presented in this section are based on asset information found in Appendix A, membership data found in Appendix B, plan provisions summarized in Appendix D, and the Funding Policy summarized in Appendix E of the report. The methods and assumptions used in the funding policy valuation are described later in this section.

Funding Policy Valuation Funded Status

The funding policy valuation funded status of the CSJ SRP Plan is determined by comparing the fair market value of the assets to the funding policy actuarial liabilities. The funding policy actuarial liabilities are based on the benefits earned up to the valuation date assuming the CSJ SRP Plan continues indefinitely.

The funding policy valuation funded status of the CSJ SRP Plan as at January 1, 2022, along with the results in the previous valuation as at January 1, 2021, are found below:

Table 1.1 – Funding Policy Valuation Funded Status

	January 1, 2022	January 1, 2021
	\$M	\$M
Market Value of Assets		
– Fair market value of assets (including receivables/ payables)	810.0	719.6
Funding Policy Actuarial Liabilities		
– Active and disabled members	218.6	212.7
– Terminated deferred vested members	3.8	3.0
– Retired members and survivors	496.4	482.6
– Outstanding refunds and withholding amounts	0.0	0.0
– Indexing reserve established under Step 6 of Funding Policy	11.2	5.1
– Total	730.0	703.4
Funding policy valuation excess (unfunded liability)	80.0	16.2
Termination value funded ratio [calculated in accordance with paragraph 14(6)(e)] of Reg. [2012 – 75]	111.0%	102.3%

The termination value funded ratio is used in the calculation of the “termination value” of any individual’s pension benefits at termination of employment, death, marriage breakdown, or retirement, as the case may be, in accordance with the terms of the CSJ SRP Plan and subsection 18(1) of Regulation 2012-75. It is calculated in accordance with paragraph 14(6)(e) of Regulation 2012-75.

Funding Policy Valuation Normal Cost and Excess Contributions

The table below provides the funding policy valuation normal cost, which is the value of the pension benefits being earned in the twelve-month period after the valuation date. It compares the funding policy valuation normal cost to the level of member and employer contributions in order to determine the level of contributions being made to the CSJ SRP Plan in excess of the funding policy valuation normal cost. Results for the calendar year 2022 are presented below, along with the results for 2021 found in the previous valuation as at January 1, 2021.

Table 1.2 – Funding Policy Valuation Normal Cost and Excess Contributions

	Year Following January 1, 2022		Year Following January 1, 2021	
	\$M	% of payroll	\$M	% of payroll
A. Member initial contributions	6.7	10.4%	6.7	10.4%
B. City initial contributions	8.5	13.2%	8.6	13.2%
C. City temporary contributions	10.9	17.0%	11.0	17.0%
D. Funding policy valuation normal cost	9.4	14.6%	9.4	14.5%
E. Excess contributions (A. + B. + C. – D.)	16.7	26.0%	16.9	26.1%
Estimated payroll for following year	64.1		64.9	

Determination of 15-Year Open Group Funded Ratio

The table below provides the 15-year open group funded ratio as calculated in accordance with the requirements of paragraph 14(6)(f) of Regulation 2012-75. This ratio is used extensively in the Funding Policy to determine the actions to be undertaken by the Trustees under the funding deficit recovery plan and the funding excess utilization plan. The 15-year open group funded ratio is calculated as follows:

Table 1.3 – 15-Year Open Group Funded Ratio

	January 1, 2022	January 1, 2021
	\$M	\$M
A. Market value of assets (including receivables / payables)	810.0	719.6
B. Present value of excess contributions over next 15 years [calculated in accordance with Reg. 14(6)(c)]	135.7	148.1
C. Funding policy valuation actuarial liabilities	730.0	703.4
D. 15-year open group funded ratio [(A. + B.) / C.]	129.6%	123.4%

Reconciliation of Funding Policy Valuation Funded Status with Previous Valuation

The table below describes the change in the Plan's funded status between the last funding policy valuation as at January 1, 2021 and this funding policy valuation as at January 1, 2022:

Table 1.4 – Reconciliation of Funded Status

	\$M	\$M
Funding policy valuation excess (unfunded liability) as at January 1, 2021		16.2
Expected changes in funded status:		
– Interest on funding excess (unfunded liability)	0.7	
– Contributions in excess of normal cost	16.6	
– Cost of CPI indexing awarded as at January 1, 2022 at 0.74% (Step 1)	(5.1)	
– Cost of AIW indexing awarded as at January 1, 2022 at 6.03% (Step 3)	(13.4)	
– Cost of early retirement rules and other ancillary benefits for service in 2020 (Steps 4 and 5)	(2.6)	
– Allocation to indexing reserve (Step 6)	(5.9)	
Total		(9.7)
Expected funding policy valuation excess (unfunded liability) as at January 1, 2022		6.5
Actuarial gains (losses) due to the following factors:		
– Investment return on actuarial value of assets	70.5	
– Retirements	3.1	
– Mortality	(0.1)	
– Terminations	0.2	
– Other factors	(0.2)	
Total		73.5
Funding policy valuation excess (unfunded liability) as at January 1, 2022		80.0

The references to Steps 1 to 6 in the above table are related to the corresponding step found under the heading “Other Actions” of Section VI – Funding Excess Utilization Plan of the Funding Policy for the Plan.

Reconciliation of Total Normal Cost

The factors contributing to the change in the total normal cost from the last funding policy valuation as at January 1, 2021 and this funding policy valuation as at January 1, 2022 are shown below:

Table 1.5 – Reconciliation of Total Normal Cost

	% of payroll
Total normal cost as at January 1, 2021:	14.5%
Impact of changes in demographics:	0.1%
Impact of changes in actuarial assumptions:	0.0%
Total normal cost as at January 1, 2022 (see Table 1.2 D.):	14.6%

Funding Policy Actuarial Methods

Asset Valuation Method

The assets used under the funding policy valuation are equal to the fair market value of the assets. This is a requirement of paragraph 14(6)(d) of Regulation 2012-75.

Actuarial Cost Method

The funding policy valuation actuarial liabilities and normal cost were calculated using the accrued benefit (or unit credit) actuarial cost method in accordance with the requirement of paragraph 14(7)(a) of Regulation 2012-75.

The funding policy valuation actuarial liabilities are equal to the actuarial present value of benefits earned by members for services prior to the valuation date, taking into account the actuarial assumptions as indicated hereafter. For greater certainty, it does not take into account the impact of any future salary increases, and the impact of any future increases in accrued pensions due to cost-of-living adjustments as may be granted from time to time by the Trustees in accordance with the plan documents and the Funding Policy.

The funding policy valuation normal cost is equal to the actuarial present value of benefits expected to be earned by members in the year following the valuation date. A salary increase estimate has been made to calculate the estimated normal cost and estimated member and employer contributions for the year following the valuation date.

The disabled members are valued as active members; however, we assumed that there would be no contributions from them or from the City on their behalf.

The ratio of the total normal cost to the covered payroll for the period will tend to stabilize over time if the demographic characteristics of the active and disabled members remain stable. All other things being equal, an increase in the average age of the active and disabled members will result in an increase in this ratio.

For valuation purposes, to determine eligibility for benefits and for any other use, the age used is the age on the date of the nearest birthday.

Funding Policy Actuarial Assumptions

The main actuarial assumptions employed for the funding policy actuarial valuation are summarized in the following table.

Emerging experience differing from these assumptions will result in gains or losses, which will be revealed in future funding policy actuarial valuations. Experience gains and losses emerging in future funding policy actuarial valuations will impact the open group funded ratio of the CSJ SRP Plan, which in turn will impact the types and timing of any actions to be taken by the Trustees in accordance with the Funding Policy. All rates and percentages are annualized unless otherwise noted.

Table 1.6 – Funding Policy Actuarial Valuation Assumptions

		January 1, 2022		
Discount rate		4.50% per annum		
Salary increase for year following valuation (for normal cost purposes only, and inclusive of promotional increases)		2.85%		
Mortality	70% CPM Priv 2014, 30% CPM Publ 2014 weighted table, projected with improvement scale B with adjustment factors of 105% for males and 102% for females			
Retirement Age	All members will retire upon reaching “88 points”, or in one year from the valuation date for those who have already reached the “88 points”, but no later than age 65			
Termination of employment (Sample rates of termination other than by death or retirement)	Age	Male	Female	
	22	9.0%	13.1%	
	27	5.3%	10.9%	
	32	2.6%	7.1%	
	37	1.4%	4.5%	
	42	0.9%	2.6%	
	47	0.5%	0.8%	
	52+	0.0%	0.0%	
Disability	None explicitly assumed. Current disabled members included in normal cost (no contributions assumed) – resulting in an increase in normal cost of 0.30% of contributory payroll at valuation date			
Proportion with a spouse or common-law partner at retirement	85%			
Spousal age difference	Males 2 years older than females			
Expenses	Implicit in discount rate			

Rationale for Material Actuarial Assumptions

The assumptions have been reviewed in light of current economic and demographic conditions.

Inflation

Given the historical increases in consumer prices in Canada, the rates expected by the market, the portfolio managers' expectation, the Bank of Canada policy and the long-term forecasts of the Conference Board of Canada, LifeWorks believes that the expected long-term rate of inflation should be between 1.75% and 2.25%.

Consistent with this range, we have used an inflation assumption of 2.10% per annum. Canadian inflation has remained near the Bank of Canada's target during a sustained period of economic growth and stimulus following the 2008 economic downturn which has provided some evidence of the Bank of Canada's ability to manage inflation. Despite a recent increase in inflation in 2021 and 2022, we believe that our long-term assumption remains appropriate. There is no change from the previous valuation.

Discount Rate Development

The elements considered in the development of the discount rate assumption for purposes of the funding policy valuation are summarized in the table below.

Table 1.7 – Development of Funding Policy Valuation Discount Rate

	%
Expected long-term nominal return based on the results of our stochastic analysis (using long-term target asset mix, and including the impact of rebalancing and diversification)	5.9%
Value added for active management (not exceeding the additional fees paid for active management over passive management)	0.3%
Assumed margin for adverse deviation (originally set to achieve a high probability of exceeding the discount rate over the next 20 years)	(1.2%)
Expected expenses paid from the fund	(0.5%)
Discount rate	4.5%

The expected long-term nominal return by asset class is provided in Appendix C. The target asset mix reflects changes to the SIPG up to and including the changes that were approved by the Board of Trustees on September 28, 2022.

Expenses Paid From the Fund

The allowance for investment and administrative expenses to be paid from the fund as built into the discount rate is 0.50% of assets on a long-term basis. The allowance reflects the current level of expenses paid from the fund.

Rate of Salary Increase

We assumed salary increases of 2.85% per year for the year following January 1, 2022, and on a long-term basis. This rate is based on assumed inflation of 2.10% per year, and an additional 0.75% on

account of productivity and general merit and promotion increases, considering current economic and financial market conditions.

Mortality

In order to take into account the improvements in life expectancy substantiated by the Canadian Institute of Actuaries in its report on Canadian Pensioners Mortality (published on February 13, 2014), we used 70% of the CPM-2014Priv Mortality Table and 30% of the CPM-2014Publ Mortality Table, and the CPM-B Improvement Scale, which varies by gender, age and calendar year. We believe that the use of a combination of the private and public tables above better reflect the nature of existing occupation types at the Employer compared to using solely the public sector table. Adjustment factors of 105% and 102% for males and females, respectively, were also applied to the mortality table to take into account the mortality experience in New Brunswick. This assumption remains unchanged from the previous valuation.

We will continue to monitor this assumption for reasonableness.

Termination

We have used the same termination rates as used in the previous valuation. We will continue to monitor this assumption for reasonableness.

Retirement

The Board of Trustees under Step 4 of the Funding Excess Utilization Plan has awarded unreduced early retirement at “85 points rule” on pensions accrued from January 1, 2013 to December 31, 2020. We believe the Board will continue to award future Step 4 increases as long as the funded status of the Plan allows them to do so and that this will influence members to retire earlier. As such, we have assumed that all members will retire upon reaching “88 points”, or age 65.

Furthermore, we also used the same assumption for disabled members, in light of the recent plan amendment allowing disabled members to receive a pension from the Plan as early as age 55.

This assumption remains unchanged from the previous valuation.

We will continue to monitor this assumption for reasonableness.

Opinion on Funding Policy Valuation

In my opinion, for the purposes of the funding policy valuation section of the report:

- The membership data on which the valuation is based are sufficient and reliable for the purposes of the valuation.
- The assumptions are appropriate for the purposes of the valuation.
- The methods employed in the valuation are appropriate for the purposes of the valuation.

This funding policy valuation section of this report has been prepared, and my opinions given, in accordance with accepted actuarial practice in Canada.

The assumptions used under the funding policy valuation section of this report were reasonable and consistent with the objectives of the CSJ SRP Plan at the time this actuarial valuation report was prepared. The funding policy valuation assumptions are consistent with the stochastic model inputs.

Respectfully submitted,



Yves Plourde, FSA, FCIA

September 2022

Section 2 – Risk Management Goals and Procedures

Meeting Risk Management Goals

The CSJ SRP Plan was designed to achieve or exceed the risk management goals prescribed under the PBA and Regulation 2012-75. Certain procedures were developed to test whether these goals can be achieved given the contribution rules and benefits defined in the CSJ SRP Plan. These goals and procedures are described separately below, along with the results of the stochastic analysis that are relevant under the PBA as at January 1, 2022.

Risk Management Goals

The primary risk management goal is to achieve a 97.5% probability that base benefits will not be reduced over the 20 years following the valuation.

The goal is measured by taking into account the following funding management plans:

1. the funding deficit recovery plan except for reduction in past base benefits, and
2. the funding excess utilization plan excluding permanent benefit changes.

The funding deficit recovery plan and the funding excess utilization plan are described in Sections V and VI of the Funding Policy, respectively.

There are two secondary risk management goals under the PBA. These are:

- On average provide contingent indexing on base benefits of active members that are in excess of 75% of the Consumer Price Index (CPI) over the next 20 years, and provide contingent indexing on base benefits of retirees and deferred vested terminated members that are in excess of 75% of the average Pre-Conversion Indexation over the next 20 years.
- On average be expected to at least provide 75% of the value of the ancillary benefits described in the plan documents at conversion over the next 20 years.

For the purposes of meeting these goals, base benefits include the accrual of extra service of members and any contingent indexing provided based on the financial performance represented by each scenario tested.

If as a result, through the testing process, a scenario allows for indexing in a given future year, then this contingent indexing amount becomes part of the base benefits that is to be protected. In other words, the base benefit is dynamically adjusted based on the stochastic results for each economic scenario tested.

Risk Management Procedures

The risk management goals are measured using an asset liability model with future economic scenarios developed using a stochastic process.

The risk management goals were tested as at January 1, 2022. The results of these tests combined with the results of the funding policy actuarial valuation at the same date will assist in determining the actions the Board of Trustees is required to take, or can consider, as applicable, under the terms of the Funding Policy.

The primary risk management goal must be achieved or exceeded:

- At January 1, 2013 (i.e. the Conversion Date);
- At the date a permanent benefit change as defined in the Regulations is made;
- At the date a benefit improvement as defined in the Regulations is made;
- At the date contribution adjustments that exceed those provided under Section IV of the Funding Policy are implemented; and
- At the date temporary contributions are reduced before March 31, 2028 under the conditions provided for under Section IV of the Funding Policy.

The secondary risk management goals must be achieved or exceeded:

- At January 1, 2013 (i.e. the Conversion Date); and
- At the date a permanent benefit change as defined in the Regulations is made.

The definitions of “permanent benefit change” and “benefit improvement” are as follows:

“permanent benefit change” means a change that is intended to permanently change the formula for the calculation of the base benefits or ancillary benefits after the date of the change, including a change made in accordance with the funding excess utilization plan.

“benefit improvement” means an escalated adjustment for past periods or an increase in other ancillary benefits allowed under the Funding Policy.

Additional Assumptions on a Funding Policy Basis for Purposes of the Stochastic Analysis

Additional assumptions are required to determine the level of future cash flows to and from the CSJ SRP Plan, such as member and employer contributions, normal costs, benefit payments and expenses. These cash flows are calculated on a deterministic basis for each year following the valuation date for a period of 20 years, and allows the determination of the funding policy actuarial liability and assets at each future date, as well as the determination of the present value of 15-year excess contributions in accordance with paragraph 14(6)(c) of Regulation 2012-75. Furthermore, all this information is used in the stochastic analysis required under the risk management procedures for the CSJ SRP Plan.

Table 2.1 – Additional Funding Policy Actuarial Valuation Assumptions for Purpose of Calculating Future Year Cash Flows and Actuarial Liability

January 1, 2022		
New entrants	Each active member is replaced at termination, death or retirement by a new entrant with no net increase in the active plan membership	
Distribution of new entrants and salary at entry	Regular Members	
	Age Distribution Average Salary at Entry	
	30 33 ⅓%	
	40 33 ⅓%	
	50 33 ⅓%	
	50% female / 50% male	
	Police and Fire	
	Age Distribution Average Salary at Entry	
	23 33 ⅓%	
	29 33 ⅓%	
35 33 ⅓%		
10% female / 90% male		
Inflation	2.10% per annum	
Salary increases	2.85% per annum	

Results of Stochastic Analysis as at January 1, 2022

The stochastic analysis undertaken as at January 1, 2022, took into account the main following items:

- Membership Data as at January 1, 2022 summarized in Appendix B;
- Economic and demographic assumptions as at January 1, 2022 for the funding policy valuation summarized in Section 1;
- Pension fund long-term target asset mix as summarized in Table A.4 of Appendix A;
- Stochastic projection assumptions as summarized in Appendix C;
- Risk management procedures described above;
- CSJ SRP Plan provisions summarized in Appendix D;
- Funding deficit recovery plan found under Section V of the Funding Policy (except for reduction in past or future base benefits);
- Funding excess utilization plan found under Section VI of the Funding Policy (excluding permanent benefit changes).

Based on the above, the results of the stochastic analysis for the various risk management goals as at January 1, 2022 are as follows:

Table 2.2 – Results of Stochastic Analysis for the Various Risk Management Goals

Risk Management Goal	Minimum Requirement under PBA	Result for CSJ SRP Plan as at January 1, 2022
Primary Goal [Regulation 7(1)]		
There is at least a 97.5% probability that the past base benefits at the end of each year will not be reduced over a 20-year period	97.5%	98.6%
		PASSED
Secondary Goal 1 [Regulation 7(3)(a)]		
Expected contingent indexing of base benefits of active members for service before the conversion date shall, on average over the next 20-year period, exceed 75% of the increase in the Consumer Price Index;	We estimated that the combined impact of the Secondary Goal 1 for active members, retirees and deferred vested member was a Minimum Requirement under the PBA of about 56% of the assumed increase in the Consumer Price Index.	98.6% of the assumed increase in the Consumer Price Index
or		
Expected contingent indexing of base benefits of retirees and deferred vested members for service rendered before the conversion date shall, on average over the next 20-year period, exceed 75% of the escalated adjustments specified in the pension plan immediately before it was converted to a shared risk plan	This is the weighted average of 75% of CPI for active members, and 47% of CPI for retirees and deferred vested members.	
Secondary Goal 2 [Regulation 7(3)(b)]		
The amount of ancillary benefits (other than contingent indexing) that are expected to be provided shall, on average over the next 20-year period, exceed 75% of the value of the ancillary benefits specified in the plan text	75% of ancillary benefit will be provided	At or above 96.6% (See Note below)
		PASSED

Note: The Funding Policy only provides for the reduction of one type of ancillary benefit under the funding deficit recovery plan at step 2. This is the replacement of early retirement reductions for post conversion service by full actuarial reductions for members not yet eligible to retire. We expect this ancillary benefit would be reduced in about 3.4% of our 10,000 20-yr scenarios. If this is the only ancillary benefit reduced, and it was eliminated completely, then we can expect that 96.6% of the value of ancillary benefits will be provided over the 20-year period.

Section 3 – Going-Concern Valuation

The going-concern actuarial valuation is conducted in accordance with paragraph 14(1) of Regulation 2012-75 in order to determine the maximum eligible employer contribution for the CSJ SRP Plan under paragraph 147.2(2) of the ITA and provide the required actuarial opinion.

The going-concern actuarial valuation results presented in this section are based on asset information found in Appendix A, membership data found in Appendix B, and CSJ SRP Plan provisions summarized under Appendix D. The methods and assumptions used in the going-concern valuation are described later in this section.

Going-Concern Funded Status

The funded status of the CSJ SRP Plan on the going-concern basis is determined by comparing the actuarial value of the assets to the actuarial liabilities. The actuarial liabilities are based on the benefits earned up to the valuation date assuming the CSJ SRP Plan continues indefinitely. It also has a provision for future cost-of-living adjustments to be provided by the Trustees in accordance with the plan documents and the Funding Policy. Such a provision is acceptable under paragraph 147.2(2)(c) of the ITA.

The going-concern valuation funded status of the CSJ SRP Plan as at January 1, 2022, along with the results of the previous going-concern valuation as at January 1, 2019, are found below:

Table 3.1 – Going-Concern Funded Status

	January 1, 2022	January 1, 2019
	\$M	\$M
Actuarial value of assets		
– Fair market value of assets (including receivables/ payables)	\$810.0	\$595.9
Going-concern actuarial liabilities		
– Active and disabled members	347.7	340.8
– Terminated deferred vested members	6.7	3.4
– Retired members and survivors	621.3	529.2
– Outstanding refunds and withholding amounts	-	0.2
– Total	\$975.7	\$873.6
Going-concern funding excess (unfunded liability)	(\$165.7)	(\$277.7)
Going-concern funded ratio	83.0%	68.2%

Going-Concern Residual Normal Cost

The table below summarizes the estimated going-concern residual normal cost of pension benefits being earned in the twelve-month period after the valuation date, along with the results of the previous going-concern valuation as at January 1, 2019.

Table 3.2 – Going-Concern Residual Normal Cost

	As At January 1, 2022		As At January 1, 2019	
	\$M	% of payroll	\$M	% of payroll
Total Normal Cost	15.6	24.4	15.4	23.2
Less member contributions	(6.7)	(10.4)	(6.9)	(10.4)
Residual normal cost	8.9	14.0	8.5	12.8
Total annualized payroll	64.1		66.3	

Maximum Eligible Employer Contribution under the Income Tax Act

The maximum eligible employer contribution in accordance with the ITA is equal to the residual normal cost, plus the greater of the going-concern unfunded liability and the hypothetical wind-up deficiency. Under a shared risk plan, the hypothetical wind-up deficiency will typically be nil. However, the anti-avoidance rule under Section 16 of Regulation 2012-75 may be triggered if a wind-up occur in the first ten years following the conversion of the shared risk plan. For purposes of calculating the maximum eligible employer contribution, we have ignored the hypothetical wind-up deficiency that could exist for the first ten years after conversion.

On the basis of the methods and assumptions in this report, the maximum eligible employer contribution for the year following January 1, 2022 is equal to \$174,600,000 (representing \$8,900,000 of residual normal cost and \$165,700,000 of going-concern unfunded liability).

When spreading the going-concern unfunded liability over the next three years (period for which this going-concern valuation is valid under the PBA), the maximum eligible employer contribution for the three years following January 1, 2022 (ignoring interest and salary increases) would be as follows:

Table 3.3 – Maximum Eligible Employer Contributions Spread Over Three Years

Year Following...	Going-Concern Unfunded Liability	Residual Normal Cost	Total	
	\$M	\$M	\$M	% of payroll
January 1, 2022	55.2	8.9	64.1	100.2
January 1, 2023	55.2	8.9	64.1	100.2
January 1, 2024	55.2	8.9	64.1	100.2

Based on the above, the average employer initial contribution requirements under the terms of the CSJ SRP Plan of 13.2% of payroll plus the employer temporary contribution of 17.0% of payroll, for a total

employer contribution of 30.2% of payroll, are eligible contributions under the ITA. Furthermore, should employer contributions be increased to 32.7% of payroll as would be required under the Funding Policy if the 15-year open group funded ratio of the CSJ SRP Plan dropped below 100% for two years in a row, those higher employer contributions would also be eligible contributions under the ITA up to the date of the next going-concern valuation scheduled no later than January 1, 2025.

Going-Concern Valuation Actuarial Methods and Assumptions

The asset valuation method and the actuarial cost method under the going-concern valuation are identical to the asset valuation method and the actuarial cost method under the funding policy valuation. The going-concern valuation assumptions are also identical, except for the discount rate and the addition of a provision for future cost-of-living adjustments.

Discount Rate

In order to balance the need to fund intended benefits in a secure and responsible manner, while recognizing the necessity for CRA to monitor the impact of over-conservatism in assumptions, we developed a methodology to select an appropriate discount rate which we believe will balance those concerns. The discount rate selected is determined by using the nominal investment return expected from the long-term asset mix of the CSJ SRP Plan over the next 20 years at its 33rd percentile, minus 1.0% (to account for inclusion of any margins for adverse deviation and any and all expenses to be paid from the fund), with the caveat that the going concern valuation discount rate cannot be lower than the funding policy valuation discount rate. This leads to a net discount rate of 4.50% per year, which is the same discount rate as used in the funding policy valuation. In the previous going concern valuation as at January 1, 2019, a discount rate of 4.90% per year was used when applying the same methodology.

Assumed Contingent Indexing on Accrued Pensions and Pensions in Payment

A provision for future cost-of-living adjustments on the amount of the accrued pensions of active and disabled members, and terminated deferred vested members, and on the amounts of current and future pension payments is made. This provision satisfies the requirements of section 147.2(2)(c) of the ITA.

The Funding Policy for the CSJ SRP Plan indicates the triggers that will be used and the amount that can be provided in cost-of-living adjustments when the triggers are met. This clearly indicates the intention to provide cost-of-living adjustments, and cost-of-living adjustments have been provided every year since the conversion date. Our stochastic modeling of the CSJ SRP Plan over the next 20 years indicates that such indexing is most likely to continue to be provided in the future. While this is by no means a guaranteed outcome, the contributions have been set at a level that there is a high likelihood of providing indexing, both during the pre-retirement and post-retirement periods.

As a result, and in accordance with the PBA, we have conducted the going concern valuation based on these benefit intentions, which would provide for indexing of accrued pensions before assumed retirement at 2.85% per annum (similar to the salary increase assumption in our funding policy valuation), and indexing of pensions after retirement of 2.10% per annum (reflecting the inflation assumption in our funding policy valuation).

Other Going-Concern Actuarial Assumptions

All other assumptions in our going-concern valuation are identical to the assumptions used under the funding policy actuarial valuation detailed in Table 1.6 of Section 1 of this report, and the rationale for the choice of those assumptions also applies for the going-concern valuation.

The additional assumptions detailed in Table 2.1 of Section 2 are not required under the going-concern actuarial valuation, and therefore do not apply.

Emerging experience differing from these assumptions will result in gains or losses, which will be revealed in future going-concern actuarial valuations.

Opinion on Going-Concern Valuation

In our opinion, for the purposes of the going-concern valuation section of the report:

- The membership data on which the valuation is based are sufficient and reliable for the purposes of the valuation.
- The assumptions are appropriate for the purposes of the valuation.
- The methods employed in the valuation are appropriate for the purposes of the valuation.

This going-concern valuation report has been prepared, and our opinions given, in accordance with accepted actuarial practice in Canada.

The assumptions used under the going-concern valuation of this report were reasonable at the time this actuarial valuation report was prepared.

Respectfully submitted,



Yves Plourde, FSA, FCIA

September 2022

Section 4 – Hypothetical Wind-up Valuation

A hypothetical wind-up valuation assumes that a pension plan is wound-up on the valuation date and members' benefit entitlements are calculated as of that date. Although this type of valuation is not required under Part 2 of the PBA for a shared risk plan, the Standards of Practice of the Canadian Institute of Actuaries require that actuarial valuation reports provide information with respect to hypothetical wind-up situations.

Subsection 16(3) of Regulation 2012-75 prescribes that if a shared risk plan is wound-up by the persons who established the plan within 5 years of its conversion date, the conversion of the plan is void and the plan has to be wound-up as a defined benefit plan under Part 1 of the PBA. In addition, effective January 1, 2018, subsection 16(3.1) of Regulation 2012-75 provides that if the wind-up occurs between 5 and 10 years after the Plan conversion date, the Superintendent may determine that the conversion is void and may require that the Plan be wound-up as a defined benefit plan under Part 1 of the PBA.

In conducting the hypothetical wind-up valuation as at January 1, 2022, we made the assumption that the conversion would be void, and that the CSJ SRP Plan would be wound-up as at January 1, 2022 in accordance with rules found under Part 1 of the PBA.

We have valued the wind-up liability using discount rates consistent with the requirements of the PBA for plan wind-ups under Part 1. The PBA requires that benefits paid out to each member upon wind-up be not less than the cost to purchase an annuity for that member. Accordingly, we have followed the Canadian Institute of Actuaries' recommendations for the estimated cost of annuity purchases as at January 1, 2022.

Hypothetical Wind-Up Funded Status

The hypothetical wind-up funded status under the scenario postulated above, including the results of the last hypothetical wind-up valuation, is as follows:

Table 4.1 – Hypothetical Wind-Up Funded Status

	January 1, 2022	January 1, 2021
	\$M	\$M
Assets		
– Market value of assets	810.0	719.6
– Provision for expenses	(0.7)	(0.7)
– Total	809.3	718.9
Hypothetical wind-up liabilities		
– Active members	455.9	515.8
– Terminated deferred vested members	11.2	9.5
– Retired members, survivors and disabled	727.0	720.0
– Outstanding refunds and withholding amounts	0.0	0.0
– Total	1,194.1	1,245.3
Assets less liabilities on the hypothetical wind-up basis	(384.8)	(526.4)

The hypothetical wind-up funded status is presented for information purposes. There is no requirement under the PBA to fund the hypothetical wind-up deficit of the CSJ SRP Plan while it is not in a wind-up state.

Hypothetical Wind-up Asset Valuation Method

Wind-up assets are equal to the market value of assets less an allowance for wind-up expenses. This valuation method is the same as the one used in the last valuation.

Hypothetical Wind-up Actuarial Cost Method

The hypothetical wind-up liabilities are determined using the accrued benefit (or unit credit) actuarial cost method. The hypothetical wind-up liabilities are equal to the actuarial present value of all benefits earned by members for services prior to the valuation date assuming the CSJ SRP Plan is wound up on the valuation date under Part 1 of the PBA. This method is the same as the one used in the last valuation. We also assumed that the disabled members who ceased to receive a disability pension from the pension plan as a result of the conversion would be re-instated as disabled pensioners under the wind-up scenario.

For valuation purposes, to determine eligibility for benefits and for any other uses, the age used is the age on the date of the nearest birthday.

Hypothetical Wind-up Actuarial Assumptions

The main actuarial assumptions used in the hypothetical wind-up valuation correspond to those prescribed by the PBA.

We have valued the hypothetical wind-up liability using discount rates consistent with the requirements of the PBA if the pension plan were to be wound up. The PBA requires that benefit paid out to each member upon wind-up be not less than the cost to purchase an annuity for that member. Accordingly, we have followed for that purpose the Canadian Institute of Actuaries' recommendations for the estimated cost of annuity purchases as at January 1, 2022.

The primary actuarial assumptions employed for the hypothetical wind-up actuarial valuation are summarized in the following table. All rates and percentages are annualized unless otherwise noted.

Table 4.2 – Hypothetical Wind-Up Actuarial Assumptions

	January 1, 2022	January 1, 2021
Discount rate for active members and deferred vested members not eligible for early retirement	2.10% per annum for 10 years, 3.10% per annum thereafter; or 2.83% per annum, if it produces a higher liability	1.20% per annum for 10 years, 2.80% per annum thereafter; or 2.60% per annum, if it produces a higher liability
Discount rate for other members	2.83% per annum	2.60% per annum
Salary increases	None	None
Mortality	CPM 2014 Table, projected with improvement scale CPM-B	CPM 2014 Table, projected with improvement scale CPM-B
Termination of employment	None	None
Provisions for wind-up expenses	\$700,000	\$700,000
Retirement (settlement by transfer of values)	50% at the age that maximizes the value of the pension and 50% at the unreduced retirement age	50% at the age that maximizes the value of the pension and 50% at the unreduced retirement age

Post-retirement indexing is also included in accordance with the terms of the Former CSJ Plan which provided for certain fixed rates of indexing dependent on the period of service.

Allowance has been made for administrative, actuarial and legal costs which would be incurred if the CSJ SRP Plan were to be wound up in full or in part. No allowance has been made for costs which may be incurred in respect of resolving surplus or deficit issues on plan wind up or the costs in respect of assets which cannot be readily realized.

The Canadian Institute of Actuaries (CIA) collects data annually from insurance companies and annually determines interest rates suitable for estimating the cost of single premium group annuities in hypothetical wind-up valuations. For pensioners and for active members and deferred vested members eligible for immediate retirement at the valuation date, the interest rate used in the present hypothetical wind-up valuation is an estimate of the rate that would be used by insurance companies in pricing single premium group annuities for annuitants already retired, based on the suggested rates for such annuitants published by the CIA.

Choice of Assumptions

Discount Rate

The discount rate used for valuing benefits for transferring members was updated to be in accordance with the recommendations of the Canadian Institute of Actuaries' (CIA) and is based on the rates of return for long-term bonds issued by the Government of Canada in January 2022.

The discount rate for non-indexed annuities is 2.83% per year. This rate is based on the CIA recommendations [the long-term Government of Canada bonds' yield (series V39062) for December 2021 of 1.66% plus an adjustment of 1.17% based on the liability duration of 14.6 years for liabilities assumed to be settled as annuities under the solvency assumption]. This is a reasonable estimate of the discount rate, which when used in conjunction with the CPM-2014 mortality rates, approximated the cost of purchasing immediate non-indexed annuities as at the valuation date.

The discount rate used for active members and deferred vested members not eligible for immediate retirement is the rate used for pensioners without adjustment, as suggested by the CIA as an appropriate estimate of the cost of deferred annuities based on their survey data from insurance companies.

Benefits are assumed to be settled by a single annuity purchase regardless of any limitation of capacity in the market for group annuity contracts.

Emerging experience differing from these assumptions will result in gains or losses, which will be revealed in future hypothetical wind-up actuarial valuations.

Termination Scenario

The termination scenario used in the hypothetical wind-up valuation includes the following assumptions:

- Plan wind-up would not result from employer insolvency.
- All assets could be realized at their reported market value.
- CSJ SRP Plan conversion would be void and the pension plan would be wound-up under Part 1 of the PBA.

Margin for Adverse Deviations

As specified by the Standards of Practice of the Canadian Institute of Actuaries, the hypothetical wind-up assumptions do not include a margin for adverse deviations.

Provision for Fees

Allowance has been made for administrative, actuarial and legal costs which would be incurred if the CSJ SRP Plan were to be wound up, based on sufficient and reliable data. It is assumed that the wind-up date, the calculation date and the settlement date are coincident, and as such, expenses related to investment policy reviews, investment and custodial fees are not included. Expenses related to the resolution of surplus and deficit issues are not taken into account. The amount of expenses is only an approximation and may differ significantly from real expenses incurred on plan wind-up, for example, in case of litigation, bankruptcy and/or eventual replacement by a third-party administrator.

Hypothetical Wind-up Incremental Cost

The method used to calculate the hypothetical wind-up incremental cost may be described as follows:

1. Present value of expected benefit payments between January 1, 2022 and January 1, 2023, discounted to January 1, 2022;
Plus
2. Projected hypothetical wind-up liabilities as at January 1, 2023, discounted to January 1, 2022;
Less
3. Hypothetical wind-up liabilities as at January 1, 2022.

Opinion on Hypothetical Wind-up Valuation

In my opinion, for the purposes of the hypothetical wind-up valuation section of the report:

- The membership data on which the valuation is based are sufficient and reliable for the purposes of the valuation.
- The assumptions are appropriate for the purposes of the valuation.
- The methods employed in the valuation are appropriate for the purposes of the valuation.

This hypothetical wind-up valuation section of this report has been prepared, and my opinions given, in accordance with accepted actuarial practice in Canada.

The assumptions used under the hypothetical wind-up valuation section of this report were reasonable at the time this actuarial valuation report was prepared.

Respectfully submitted,



Yves Plourde, FSA, FCIA

September 2022

Section 5 – Plausible Adverse Scenarios

Effective for funding valuations on or after March 1, 2019, the plan actuary is required to select Plausible Adverse Scenarios for various risks underlying the Plan, and disclose in the report the impact such scenarios would have on the funded status and risk management test results of the Plan. The results of this analysis are contained in this Section 5.

The Standards of Practice of the CIA continue to require that valuation reports disclose the sensitivity of the liabilities to changes in the discount rate assumption. As these sensitivities are also a form of stress test, we have included them in this Section 5 for completeness.

Description of the Plausible Adverse Scenarios

The Standards of Practice of the CIA require valuation reports to disclose the results of stress tests on Plausible Adverse Scenarios. A Plausible Adverse Scenario would be a scenario of adverse but plausible assumptions relative to the best estimate assumptions outlined in Section 1 of this report. As a result, these scenarios are stress tests on a selection of risks to which the Plan is subject. This selection is not meant to consider all of the risks to which the Plan is subject.

The following is a description of the four scenarios analyzed.

Scenario I - Interest Rate Risk

In this Scenario, we will model the impact of a sudden drop in fixed income yield, which will impact the level of the discount rate, and the value of the fixed income assets in the Fund. The magnitude of the drop will be such that there is a 1 in 10 likelihood of such a reduction happening in accordance with our economic model underlying our stochastic analysis.

Based on the outcome with a 1 in 10 likelihood of occurrence under our economic model, yields on fixed income assets are assumed to decrease by 1.14% immediately, leading to a 0.22% decrease in the expected return of the Plan's investments. We have not reflected any change of the assumed margin for adverse deviation to compensate for the decrease in expected return and have therefore reflected a decrease in the discount rate to 4.28% per annum for this valuation. While the Funding Policy states that the intent of the discount rate is to remain stable over time, we have illustrated the impact should the Board of Trustees change the discount rate.

In valuing the effect of this change on the Plan assets, the impact of the interest rate risk was restricted to the asset classes deemed to be fixed income investments, and results in a 10.45% increase on the market value of the affected asset classes, which translates into a 4.07% increase on the market value of the Fund as a whole.

All other assumptions and methods used for this valuation were maintained, and no other compensating adjustments were made.

Scenario II - Deterioration of Asset Values

In this Scenario, we will model the impact of a sudden drop in the value of assets other than fixed income assets, with no change in the level of the discount rate or any other assumptions. The magnitude of the drop will be such that there is a 1 in 10 likelihood of such a reduction happening for such asset classes in accordance with our economic model underlying our stochastic analysis.

Based on the outcome with a 1 in 10 likelihood of occurrence under our economic model, all assets other than fixed income assets were assumed to decrease by 10.65% immediately, resulting in a 6.49% decrease on the market value of the total Fund. No changes to funding valuation actuarial liabilities and normal cost were considered under this scenario. All assumptions and methods used for this valuation were maintained.

Scenario III - Longevity Risk

In this Scenario, we will model the impact of an increase in the average life expectancy of all plan members relative to our assumption used in our valuation. The magnitude of the increase will be such that the life expectancy is increased by 10% from the underlying mortality table assumption used in our valuation.

To test the impact of an average life expectancy increase of 10% for all ages over the current assumption on the funding policy actuarial liabilities and normal cost, a 3-year setback was applied to all mortality rates used for this valuation. All other assumptions and methods used for this valuation were maintained.

Scenario IV - Decrease in Contribution Base

In this Scenario, we will model the impact of a decrease in contribution base, where an undefined event triggers an immediate 10% reduction in active members contributing and accumulating benefits under the plan.

A decrease of 10% in payroll for the year following the valuation date is assumed. We assume that the demographic profile of the active membership is unchanged from the decrease in payroll. For purposes of this scenario, we assume that the market value of assets and funding policy actuarial liabilities are unchanged, and due to the decrease in payroll we assume a 10% reduction in contributions and normal cost for each year following the valuation date. All other assumptions and methods used for this valuation were maintained.

Plausible Adverse Scenarios - Funding Policy Valuation

The following table illustrates the impact of the above four plausible adverse scenarios on the funding policy liabilities and corresponding funded statuses and legislated risk management tests. The scenarios have been applied and reported on separately.

Table 5.1 – Plausible Adverse Scenarios Impact on the Funding Policy Valuation Results

	Plausible Adverse Scenario Results as at January 1, 2022				
	Funding Policy Valuation as at January 1, 2022	Scenario I Interest Rate Risk	Scenario II Deterioration of Asset Values	Scenario III Longevity Risk	Scenario IV Decrease in Contribution Base
	\$M	\$M	\$M	\$M	\$M
Market value of assets	810.0	842.9	757.4	810.0	810.0
Funding policy actuarial liabilities	730.0	749.5	730.0	773.6	730.0
Funding policy valuation excess (unfunded liability)	80.0	93.4	27.4	36.4	80.0
Termination value funded ratio	111.0%	112.5%	103.8%	104.7%	111.0%
Present value of excess contributions over the next 15 years	135.7	131.6	135.7	131.0	121.1
Open group funded ratio	129.6%	130.0%	122.3%	121.6%	127.6%
Funding policy valuation normal cost	9.4	9.8	9.4	9.7	8.4
Results of stochastic analysis for risk management goal					
Primary Goal [Regulation 7(1)]	98.6% PASS	98.8% PASS	98.2% PASS	97.3% FAIL	97.9% PASS
Secondary Goal 1 [Regulation 7(3)(a)]	98.6% PASS	100.0% PASS	92.6% PASS	89.2% PASS	96.1% PASS
Secondary Goal 2 [Regulation 7(3)(b)]	96.6% PASS	97.1% PASS	95.9% PASS	94.3% PASS	95.6% PASS

Discount Rate Sensitivity Results

The Standards of the CIA require that valuation reports disclose the sensitivity of the liabilities to changes in the discount rate assumption. The discount rate sensitivity results for the funding policy, going-concern, and hypothetical wind-up bases are presented below.

Sensitivity Analysis on the Funding Policy Valuation Basis

The table below illustrates the effect of 1% decrease in the discount rate on the funding policy valuation actuarial liabilities. With the exception of the discount rate, all other assumptions and methods used for this valuation were maintained.

Table 5.2 – Sensitivity of Actuarial Liabilities on the Funding Policy Basis

	January 1, 2022	Discount rate 1% lower
	\$M	\$M
Actuarial liabilities		
– Active and disabled members	218.6	262.1
– Terminated deferred vested members	3.8	4.9
– Retired members and survivors	496.4	548.6
– Outstanding refunds and withholding amounts	0.0	0.0
– Indexing reserve established under Step 6 of Funding Policy	11.2	11.2
– Total	730.0	826.8
Increase in actuarial liabilities		96.8

Sensitivity Analysis on the Funding Policy Valuation Total Normal Cost

The table below illustrates the effect on the total normal cost of using a discount rate 1% lower than the one used for the funding policy valuation. All other assumptions and methods, as used for this valuation, were maintained.

Table 5.3 – Sensitivity of Funding Policy Total Normal Cost

	As at January 1, 2022		Discount rate 1% lower	
	\$M	% of payroll	\$M	% of payroll
Total normal cost	9.4	14.6	11.4	17.8
Increase in total normal cost			2.0	3.2

Sensitivity Analysis on the Going-Concern Basis

The Standards of the Canadian Institute of Actuaries require valuation reports to disclose the sensitivity of the liabilities to changes in the discount rate assumption. The table below illustrates the effect of 1% decrease in the discount rate on the going-concern actuarial liabilities. With the exception of the discount rate, all other assumptions and methods used for this valuation were maintained.

Table 5.4 – Sensitivity of Actuarial Liabilities on the Going-Concern Basis

	January 1, 2022	Discount rates 1% lower
	\$M	\$M
Actuarial liabilities		
– Active members	347.7	433.3
– Terminated vested members	6.7	9.0
– Retired members, survivors and disabled	621.3	696.7
– Total	975.7	1,139.0
Increase in actuarial liabilities		163.3

Sensitivity Analysis on the Going-Concern Normal Cost

The table below illustrates the effect on the normal cost of using a discount rate 1% lower than the one used for the going-concern valuation. All other assumptions and methods, as used in this valuation, were maintained.

Table 5.5 – Sensitivity of Going-Concern Residual Normal Cost

	As at January 1, 2022		Discount rate 1% lower	
	\$M	% of payroll	\$M	% of payroll
Total normal cost	15.6	24.4	20.4	31.8
Less member contributions	(6.7)	(10.4)	(6.7)	(10.4)
Residual normal cost	8.9	14.0	13.7	21.4
Increase in residual normal cost			4.8	7.4

Sensitivity Analysis on the Hypothetical Wind-Up Basis

The table below illustrates the effect on the actuarial liabilities of using discount rates 1% lower than those used for the hypothetical wind-up valuation. All other assumptions and methods, as used in this valuation, were maintained.

Table 5.6 – Sensitivity of Actuarial Liabilities on the Hypothetical Wind-Up Basis

	January 1, 2022	Discount rates 1% lower
	\$M	\$M
Actuarial liabilities		
– Active members	455.9	594.8
– Terminated vested members	11.2	15.3
– Retired members, survivors and disabled	727.0	827.8
– Outstanding refunds and withholding amounts	0.0	0.0
– Total	1,194.1	1,437.9
Increase in actuarial liabilities		243.8

Incremental Cost on the Hypothetical Wind-up Basis

The incremental cost on the hypothetical wind-up basis represents the present value of the expected aggregate change in the actuarial liabilities from January 1, 2022 to January 1, 2023, adjusted for expected benefit payments in the inter-valuation period. This incremental cost is estimated to be \$25,055,000 as at January 1, 2022.

Appendix A – Assets

Description of Plan Assets

The assets of the CSJ SRP Plan are held in custody by RBC Investor & Treasury Services and are invested by various professional investment management firms in accordance with the provisions of the Statement of Investment Policies and Goals (SIPG).

Statement of Market Value

The following table shows the asset mix as at December 31, 2021 and, for comparison, the asset mix as at December 31, 2020, extracted from audited financial statements prepared by Deloitte:

Table A.1 – Assets at Market Value

	December 31, 2021	December 31, 2020
	\$	\$
Market value of assets		
– Cash and short term	17,008,547	33,567,637
– Bonds and fixed income pooled funds	312,209,076	305,039,476
– Equities	372,864,973	290,335,966
– Real estate	105,812,782	88,762,055
– Accrued interest and dividends	588,796	486,395
– Due from the City of Saint John	1,472,556	1,398,946
Total market value of assets	809,956,730	719,590,475

Changes to Plan Assets

The following table shows changes to the CSJ SRP Plan assets during the inter-valuation period, based on market values. The reconciliation is based on the audited financial statements prepared by Deloitte.

Table A.2 – Reconciliation of Market Value of Assets

	2021
	\$
Market value of assets at beginning of year	719,590,475
Receipts	
– Member contributions	6,456,762
– City contributions	18,871,858
– Investment income plus realized and unrealized capital appreciation and depreciation	105,318,674
Total receipts	130,647,294
Disbursements	
– Pensions paid	36,677,129
– Transfers and refunds	869,891
– Expenses (fees)	2,734,019
Total disbursements	40,281,039
Market value of assets at end of year	809,956,730

Return on Assets

The CSJ SRP Plan's assets earned the following rate of return, net of investment management fees and other expenses charged to the fund, based on our calculations which assume cash flow occurred in the middle of the period:

Table A.3 – Net Investment Return

Year	Rate of Return
	%
2021	14.4
2020	9.8
2019	12.6
2018	(0.6)
2017	11.0

Actuarial Value of Assets

We have used the fair market value of assets as provided in the audited financial statements produced by Deloitte. The actuarial value of assets as at January 1, 2022 was \$810.0M.

Target Asset Mix

The statement of investment policy and goals for the CSJ SRP Plan, as recently approved by the Board of Trustees on September 28, 2022, provides for the following long-term target asset mix.

Table A.4 – Long-term Target Asset Mix

Asset classes	Target
Short term	1.0%
Equities	
– Domestic equity	15.0%
– US equity	7.5%
– International equity	7.5%
Fixed income	
– Domestic long-term corporates	7.5%
– Domestic long-term provincials	7.5%
– Domestic corporates	10.0%
– Global high yield	5.0%
Alternative investments	
– Real Estate and Mortgages	15.0%
– Infrastructure	12.0%
– Private equity	4.0%
– Private debt	8.0%
Total	100.0%

This long-term target asset mix was used to determine the real rate of return assumption under the funding policy valuation and to conduct the stochastic analysis required under the PBA to assess the various risk management goals.

Appendix B – Membership Data

Description of Membership Data

Data on the CSJ SRP Plan membership was obtained from Aon and the City of Saint John. The data was provided as at January 1, 2022.

The data was matched and reconciled with data provided for the previous valuation as at January 1, 2021. Basic data checks were performed to ensure that age, salary and service data were reasonable for the purposes of the valuation and to ensure that the data was accurate, complete and consistent with previous data.

Summary of Membership Data

The following tables summarize the data used for the valuations. These tables show the following:

B.1 Summary of Membership Data

B.2 Changes in Plan Membership

B.3 Age/Service Distribution for Active Members as at January 1, 2022

B.4 Age/Service Distribution for Disabled Members as at January 1, 2022

B.5 Distribution of Retired members and survivors by Age Groups as at January 1, 2022

Table B.1 - Summary of Membership Data

		January 1, 2022	January 1, 2021
Active members	Number	777	778
	Average salary	\$82,493	\$83,504
	Average age	45.0 years	44.8 years
	Average pensionable service	13.9	14.1
	Average annual accrued pension	\$22,332	\$21,719
Disabled members	Number	27	27
	Average annual accrued pension	\$41,073	\$37,351
	Average age	58.7 years	58.3 years
Terminated deferred vested members	Number	47	36
	Average annual pension	\$11,032	\$11,499
	Average age	44.8 years	45.0 years
Retired members and survivors	Number	946	934
	Average annual lifetime pension	\$39,887	\$38,992
	Average age	72.4 years	72.1 years

Table B.2 – Changes in Plan Membership

	Active members	Disabled members	Deferred vested members	Retirees and survivors
Members at January 1, 2021	778	27	36	934
New members	47	—	—	—
Returned to Active Status	—	—	—	—
Retirements	(27)	—	—	27
Terminations:				
- with refunds or transfers out	(6)	—	(2)	—
- with deferred pensions	(13)	—	13	—
- with outstanding payments	—	—	—	—
Deaths or cessation of pension	—	(1)	—	(28)
New survivor pensions	—	—	—	12
Transferred to Disabled	(1)	1	—	—
Data Adjustments	(1)	—	—	1
Members at January 1, 2022	777	27	47	946

Table B.3 – Age/Service Distribution for Active Members as at January 1, 2022

Years of Service		Age								Total	
		Under 25	25-29	30-34	35-39	40-44	45-49	50-54	55-59		60 and Over
0 - 4	Num.	6	39	29	30	13	19	10	7	10	163
	Avg. Sal.	65,925	69,155	76,192	64,106	63,960	64,339	70,151	68,159	102,822	70,467
	Avg. Pen.	1,407	2,502	3,793	2,859	2,246	2,472	2,391	1,458	3,891	2,767
5 - 9	Num.		4	37	47	19	23	11	5	2	148
	Avg. Sal.		63,044	71,862	79,399	71,776	66,161	65,034	67,575	*	*
	Avg. Pen.		6,136	9,306	10,366	9,423	8,843	8,624	8,711	*	*
10 - 14	Num.			19	32	37	37	20	6	6	157
	Avg. Sal.			84,843	87,429	81,447	90,299	81,366	80,844	67,912	84,613
	Avg. Pen.			16,136	18,422	18,025	20,216	18,441	20,597	16,678	18,493
15 - 19	Num.				5	37	31	16	5	2	96
	Avg. Sal.				99,015	87,880	91,695	90,170	82,996	*	*
	Avg. Pen.				30,518	27,253	28,813	28,517	24,805	*	*
20 - 24	Num.					2	30	39	6	6	83
	Avg. Sal.					*	105,988	99,762	80,510	67,745	97,876
	Avg. Pen.					*	41,555	42,534	34,343	29,149	40,358
25 - 29	Num.							32	30	14	76
	Avg. Sal.							91,858	88,434	75,255	87,448
	Avg. Pen.							47,175	45,129	39,887	45,025
30 +	Num.							6	34	14	54
	Avg. Sal.							93,316	96,016	102,242	97,330
	Avg. Pen.							53,592	56,349	66,132	58,579
Total number		6	43	85	114	108	140	134	93	54	777
Avg. Sal.		65,925	68,586	76,241	78,489	*	86,481	88,634	87,265	85,188	82,493
Avg. Pen.		1,407	2,840	8,952	11,536	*	22,416	33,089	40,615	34,254	22,332

Average age: 45.0

Average number of years of service: 13.9

Notes: The age is computed at the nearest birthday.

Years of service means the number of years credited for pension plan purposes, fractional parts being rounded to the nearest integer.

Membership for active members is composed of 603 males and 174 females.

Table B.4 – Age/Service Distribution for Disabled Members as at January 1, 2022

Years of Service		Age				Total
		Under 50	50-54	55-59	60 and Over	
Under 20	Num.	1		1		2
	Avg. Sal.	*		*		*
	Avg. Pen.	*		*		*
20 – 24	Num.	1	1	1		3
	Avg. Sal.	*	*	*		97,293
	Avg. Pen.	*	*	*		37,800
25 – 29	Num.		1	5	3	9
	Avg. Sal.		*	82,993	58,695	72,493
	Avg. Pen.		*	43,662	32,204	47,502
30 +	Num.			3	10	13
	Avg. Sal.			80,897	77,763	78,486
	Avg. Pen.			47,914	47,379	47,502
Total number		2	2	10	13	27
Avg. Sal.		*	*	81,755	73,363	77,003
Avg. Pen.		*	*	40,431	43,877	41,073

Average age: 58.7

Notes: The age is computed at the nearest birthday.

Years of service means the number of years credited for pension plan purposes, fractional parts being rounded to the nearest integer.

Membership for active disabled members is composed of 22 males and 5 females.

Table B.5 – Distribution of Retired Members and Survivors by Age Groups as at January 1, 2022

Age Group	Number	Total Annual Pension
Under 60	62	2,811,285
60-64	133	6,246,182
65-69	213	9,777,945
70-74	179	7,545,302
75-79	146	5,485,083
80-84	103	3,235,141
85-89	63	1,604,032
90 and over	47	1,028,068
Total	946	37,733,039

Average age: 72.4

Notes:

Age groups are based on exact age.

The pension used is the pension payable as at January 1, 2022.

Membership for pensioners is composed of 660 males and 286 females.

Appendix C – Stochastic Projection Assumptions and Disclosures

The model inputs for our stochastic analysis are built each year using Conference Board of Canada (CBoC) forecasts, internal research, inflation expectations and by surveying the asset manager universe. This ensures we are not using inputs that are out of touch with broader expectations. We strive for accuracy in our assumptions, as high or low expectations can lead to biased results. However, when deciding between equally reasonable modeling choices, we err on the side of conservatism.

The methodology used to develop key assumptions used within the model is described below.

Economic Assumptions

Economic stochastic projection assumptions are updated annually by LifeWorks Investment and Risk Management using a multi-stage process.

Inflation

We select a long-term inflation rate assumption based primarily on the current Bank of Canada Monetary Policy. Volatility for inflation is based on historical data since the early 1990's when the current monetary policy was introduced. Historical volatility is used to estimate consumer price index volatility for future years. We also develop an assumption for market implied inflation which is used to determine fixed-income yields in any given year. We use current market data for the initial rate and then use an autoregressive time-series model to determine the market implied inflation assumption rates over the first ten projection years, at which point the rate remains stable, such that the long-term implied market inflation is consistent with our assumption for the change in the consumer price index.

Table C.1 – Market Implied Inflation

December 31	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031 and after
Market implied inflation (%)	1.80	1.84	1.87	1.91	1.95	1.98	2.02	2.06	2.09	2.13	2.17

Interest Rates

We use a building block approach to estimate the long-term interest rates for government bonds and Canadian bond indices. The three components that make up the long-term interest rate estimate are: Inflation, real return, and credit spread. After careful consideration, we assume that both real yields and credit spreads revert to projected long-term rates. Although some research papers suggest that the possibility that interest rates follow a random walk process (that is, they do not mean-revert) cannot be rejected, mean reversion is intuitive and increases the likelihood that rates will remain within a

reasonable range. Therefore, we assume each building block moves from the value in the market as of the valuation date towards its long-term level over a projected period of 10 years (and remains at the long-term level thereafter). Each of the building blocks follow a modified discrete version of the Vasicek model, using an instantaneous volatility determined from historical data.

Canadian Bond Indices

We generate expected return levels and standard deviations for Canadian bond indices in a stochastic simulation approach. We assume that the only components needed to model the returns are: yield and variation of interest rates. We make the assumption that interest rates follow a Vasicek model. To determine the impact of yield variation on return we extract the duration and convexity as of the valuation date for the FTSE Canadian bond indices and assume that it will remain constant in the future. Using the Vasicek model, we simulate 10,000 interest rate paths which we use to create 10,000 return series for various Canadian bond indices. The geometric average of the 10,000 simulated returns is taken as the return level assumption. The mean annual standard deviation of returns is taken as the standard deviation of returns.

Fixed income asset classes that were used in our modeling include, but are not limited to Canadian federal, provincial, and corporate bond indices. The following initial and ultimate average credit spreads and average nominal yields were used as at January 1, 2022.

Table C.2 – Credit Spreads and Yields by Bond Index

Asset Class	Initial Credit Spread*	Ultimate Credit Spread*	Initial Yield	Ultimate Yield
FTSE Canada Federal Bonds	n/a	n/a	1.33%	2.66%
FTSE Canada Federal Short Term Bonds	n/a	n/a	1.13%	2.31%
FTSE Canada Federal Mid Term Bonds	n/a	n/a	1.50%	2.90%
FTSE Canada Federal Long Term Bonds	n/a	n/a	1.72%	3.43%
FTSE Canada Corporate Bonds	1.13%	1.19%	2.45%	3.86%
FTSE Canada Short Term Corporate Bonds	0.73%	0.85%	1.86%	3.16%
FTSE Canada Mid Term Corporate Bonds	1.08%	1.25%	2.57%	4.15%
FTSE Canada Long Term Corporate Bonds	1.56%	1.67%	3.28%	5.10%
FTSE Canada Universe Provincial Bonds	0.73%	0.90%	2.06%	3.56%
FTSE Canada Short Term Provincial Bonds	0.21%	0.23%	1.34%	2.55%
FTSE Canada Mid Term Provincial Bonds	0.37%	0.48%	1.87%	3.38%
FTSE Canada Long Term Bonds	0.74%	0.76%	2.46%	4.19%

* The credit spread reflects the excess average yield for the index over the federal bond index of similar maturity.

Fixed income asset classes' returns and standard deviations must be consistent. We perform a check on the relationships between indices and sub-indices, and make adjustments if necessary.

Equity

The process for determining the nominal equity return assumptions uses a forward-looking building block approach. We utilize multiple sources of information, including our inflation assumptions, historical data, GDP and other economic data, growth forecasts and dividend information.

The building blocks are the change in the consumer price index assumptions determined above, the expected dividend yield for the index (adjusted for share issues and buy-backs), and Consensus Economics' GDP forecasts.

The building block approach results in equity return assumptions in the local currency of the asset classes. For foreign equity, we used Consensus Economics' estimates for purchasing power parity between the local currency and the Canadian dollars. We assume that the current exchange rate will trend linearly towards purchasing power parity over a period of 10 years.

Standard deviations and correlations of equity returns are mainly derived from historical data. To ensure consistency between indices covering different regions, we use an iterative calibration process.

We also consider differences in capitalization levels and investment styles. Small-cap equities and large-cap equities have different risk-return profiles. We use historical data to measure the return and volatility spreads between small-cap and large-cap equities.

Alternative Asset Classes

Alternative asset classes include real estate, infrastructure, hedge funds, private equity, foreign fixed income and high yield bonds.

Real estate indices do not include leverage; however, some real estate funds and strategies use leverage. Moreover, some real estate indices are only updated quarterly, resulting in an appraisal lag. Other indices are transaction based rather than appraisal based. Therefore, we must exercise some subjective judgement to estimate return levels, standard deviations and correlations.

Hedge fund indices usually include survivorship and backfill biases. Moreover, hedge fund strategies can differ from the index due to their characteristics. Most hedge funds have an absolute return target that can guide in the selection of the assumption.

Private equity may be viewed as public equity, adjusted with a liquidity risk premium. Private equity managers usually target a spread of 3% to 5% over public equities.

Infrastructure return level assumption is based on the 10-year Government of Canada bond returns, plus a spread. The spread varies on whether the investment is in infrastructure debt or in infrastructure equity.

For foreign fixed income, we utilize the same model used for Canadian fixed income except that the credit spread and real yield components are not separated due to a lack of reliable data.

Correlations & Standard Deviations

Correlations and standard deviations are mainly derived from historical data. However, recent trends and experience can potentially lead us to perform modifications on the historical correlations. Although exchange rates have little impact on long-term equity return levels, they do have an impact on correlations.

Correlations between certain pairs of asset classes are unstable through time, particularly for alternative asset classes. Historical correlations may show a large diversifying advantage for certain assets, which may not be properly supported by theoretical evidence. In cases of a strong negative correlation, we consider whether this correlation should be trended back towards zero.

The correlation matrix must be consistent. Consistency is required for theoretical accuracy and in stochastic simulations. We use an algorithmic approach to ensure consistency of the correlation matrix.

Returns, Volatility, and Correlations by Asset Class

The following expected return and volatility by asset class were used as at January 1, 2022. For reference, we have also included the return and volatility as at the date of the previous valuation, January 1, 2021.

Table C.3 – Expected Nominal Return and Volatility (standard deviation) by Asset Class

	January 1, 2022		January 1, 2021	
	Expected Annualized Long-term Return	Volatility of Annual Return	Expected Annualized Long-term Return	Volatility of Annual Return
Inflation (change in the consumer price index)	2.10%	1.30%	2.10%	1.30%
Asset Classes				
Fixed income:				
– Short term assets (ST)	1.40%	1.2%	1.55%	1.2%
– Domestic Long-Term Corporate (DLTC)	3.75%	10.2%	3.50%	9.9%
– Domestic Long-Term Provincial (DLTP)	2.75%	10.7%	2.45%	10.0%
– Domestic Corporate (DC)	3.15%	5.0%	2.95%	4.9%
– Global High Yield (GHY)	4.70%	12.3%	4.90%	11.8%
Public equities:				
– Canadian equities (CE)	6.60%	16.2%	7.05%	16.4%
– US equities (USE)	6.65%	16.9%	6.25%	16.7%
– International equities (IE)	7.15%	15.2%	6.30%	15.2%
Alternative Investments:				
– Real Estate and Mortgages (RE & M)	5.90%	9.4%	6.15%	10.8%
– Infrastructure (I)	6.10%	12.4%	6.05%	12.7%
– Private Equity (PE)	9.70%	22.6%	9.60%	23.0%
– Private Debt (PD)	3.90%	5.0%	3.70%	5.0%

For every year in the 20-year projection, expenses of 10 basis points to reflect the cost of passive management is deducted from the assets (the additional cost of active management is expected to be achieved in addition to the expected returns shown above and therefore are not included in the analysis). In addition, we included a flat expense of \$850,000 (in 2022, and increased with assumed

inflation thereafter), to cover all other administrative expenses paid from the fund other than passive management.

The following is the correlation among the various asset classes identified in Table C.3 used as at December 31, 2021. For fixed income asset classes, the correlations are based on the real yields of the assets, whereas for non-fixed income asset classes, the correlations are based on the assets returns:

Table C.4 - Simulation Correlations Among Asset Classes and Fixed Income Yields

Asset Classes	Inflation	ST	DLTC	DLTP	DC	GHY	CE	USE	IE	RE & M	I	PE	PD
Inflation	1.00	0.29	0.00	-0.01	0.19	-0.06	0.15	-0.21	-0.12	0.38	0.10	-0.07	0.19
ST		1.00	0.13	0.21	0.59	-0.05	0.25	0.13	0.27	0.49	0.06	0.15	0.60
DLTC			1.00	0.95	0.72	0.56	-0.20	-0.11	-0.06	-0.12	0.24	-0.16	0.70
DLTP				1.00	0.74	0.36	-0.01	0.02	0.11	-0.05	0.24	-0.01	0.73
DC					1.00	0.29	0.06	0.03	0.12	0.30	0.24	0.02	0.98
GHY						1.00	-0.64	-0.49	-0.55	-0.20	0.11	-0.51	0.28
CE							1.00	0.40	0.56	0.24	0.07	0.56	0.06
USE								1.00	0.76	0.06	-0.11	0.61	0.04
IE									1.00	0.22	-0.08	0.61	0.12
RE & M										1.00	0.08	0.10	0.29
I											1.00	-0.03	0.24
PE												1.00	0.02
PD													1.00

The correlations are assumed to remain constant over the entire projection period.

Forecasted Funding Policy Valuation Liabilities

As required under paragraph 15(2)(c) of Regulation 2012-75, the projection of the liability and future cash flows under the stochastic analysis uses the same demographic assumptions as used for the calculation of the funding policy valuation liability. As such, the funding policy valuation assumptions are used to project the demographics of the Plan on a deterministic basis 20 years into the future. Both the economic and demographic assumptions in Table 1.6 and Table 2.1 are used to project the number of members and their salaries, with each active member being replaced at death or retirement by a new entrant, resulting in the membership profile outlined herein. The following table contains the results of the deterministic projection, in particular the number of active and disabled members, along with their average pensionable service, average age, and average pensionable earnings for the year for each of the 20 years in the projection period.

Note that Table C.5 below includes 27 members on disability at the valuation date. Future disabled members are modeled through the use of a 0.30% loading on the annual normal cost. Future new

entrants are modeled to replace true active members only, and not members on disability. For this reason, a decreasing active and disabled population is shown below reflecting the expected retirement of disabled members without new entrants, with a stable underlying active population when including new entrants.

Table C.5 – Projection Statistics for Active and Disabled Members

Date	Number of Active and Disabled Members	Average Age (years)	Average Pensionable Service (years)	Average Salary*
31-Dec-22	789	46.2	14.9	\$84,965
31-Dec-23	785	44.5	12.6	\$85,234
31-Dec-24	783	44.8	12.5	\$87,051
31-Dec-25	783	45.3	12.7	\$89,119
31-Dec-26	783	45.7	13.0	\$90,919
31-Dec-27	783	46.0	13.2	\$93,167
31-Dec-28	781	46.5	13.5	\$95,369
31-Dec-29	779	46.7	13.7	\$97,529
31-Dec-30	779	46.8	13.8	\$99,906
31-Dec-31	777	47.2	14.0	\$101,979
31-Dec-32	777	47.3	14.1	\$104,025
31-Dec-33	777	47.4	14.0	\$106,412
31-Dec-34	777	47.7	14.2	\$108,934
31-Dec-35	777	47.9	14.4	\$111,402
31-Dec-36	777	47.7	13.9	\$113,367
31-Dec-37	777	47.7	13.8	\$116,123
31-Dec-38	777	47.4	13.5	\$119,085
31-Dec-39	777	47.4	13.4	\$122,083
31-Dec-40	777	47.5	13.3	\$125,292

* These are average salaries in each year reflecting the expected salary increase. The inflationary component of actual salary increases for a particular simulation are adjusted to be consistent with the inflationary increase within that simulation.

The following table contains the results of the deterministic projection, in particular the number of inactive members, along with the total expected benefits in payment to inactive members over the projection period. Note that inactive members include all members who are not active or disabled members (including but not limited to deferred vested members and pensioners). The benefit payments outlined in the table below do not include any future cost-of-living adjustments which may be granted.

Table C.6 – Projection Statistics for Inactive Members

Date	Number of Inactive Members	Inactive Benefits in Payment (\$,000)
31-Dec-22	1,014	38,080
31-Dec-23	1,096	42,105
31-Dec-24	1,124	42,842
31-Dec-25	1,142	43,199
31-Dec-26	1,161	43,378
31-Dec-27	1,178	43,633
31-Dec-28	1,193	43,880
31-Dec-29	1,213	44,222
31-Dec-30	1,234	44,568
31-Dec-31	1,252	44,885
31-Dec-32	1,273	45,207
31-Dec-33	1,297	45,554
31-Dec-34	1,313	45,585
31-Dec-35	1,332	45,527
31-Dec-36	1,364	46,071
31-Dec-37	1,388	46,243
31-Dec-38	1,422	46,368
31-Dec-39	1,449	46,259
31-Dec-40	1,470	46,095
31-Dec-41	1,495	46,078

The following table contains the results of the deterministic projection, in particular the total liability at the beginning of each year. The total liability is further split by actives and inactives. The liabilities outlined in the table below are all calculated using the funding policy valuation discount rate and do not include the value of any future cost-of-living adjustments which may be granted.

Table C.7 – Projection of Funding Policy Actuarial Liabilities

Date	Total Liability (\$M)	Active Liability (\$M)	Inactive Liability (\$M)
31-Dec-22	722	227	495
31-Dec-23	720	170	550
31-Dec-24	718	165	553
31-Dec-25	715	166	550
31-Dec-26	713	170	543
31-Dec-27	711	172	539
31-Dec-28	709	176	533
31-Dec-29	707	176	531
31-Dec-30	705	177	528
31-Dec-31	702	177	526
31-Dec-32	700	176	523
31-Dec-33	697	175	522
31-Dec-34	694	179	516
31-Dec-35	692	184	509
31-Dec-36	690	177	513
31-Dec-37	687	176	511
31-Dec-38	685	175	510
31-Dec-39	683	178	505
31-Dec-40	681	181	500
31-Dec-41	680	181	498

Stochastic Model Projection Methodology

The economic assumptions and forecasted funding policy valuation liabilities outlined above are combined together to form an asset-liability model and used in a Monte Carlo simulation technique to model 10,000 series of alternative economic scenarios over 20 years (this exceeds the minimum requirements under the PBA of 1,000 series of economic scenarios for 20 years). This model is used to measure whether the Plan achieves its risk management goals.

For each of these scenarios and for each year, the financial position of the CSJ SRP Plan is measured. For each of these measurements, a decision consistent with the funding deficit recovery plan or the funding excess utilization plan, as applicable, is modeled. When modeling the funding deficit recovery plan actions over the 20-year period of each of the 10,000 economic scenarios, each of the four steps identified in the funding deficit recovery plan under Section V of the Funding Policy is implemented in sequence until such time as the open group funded ratio of the plan reaches 100% or higher. A “past benefit reduction trial” is recorded (for purposes of the primary risk management goal calculation) when step 4 of the funding deficit recovery plan found in Section V of the Funding Policy is triggered (i.e. a reduction in past base benefits) at any point in the 20-year period of an economic scenario. The primary risk management measure is therefore the proportion of those 10,000 scenarios that do not lead to a

“past benefit reduction trial” over a 20-year period. In order to pass the primary risk management goal, at least 9,750 of those 10,000 scenarios must not trigger a “past benefit reduction trial” as described above at any point over the 20-year period.

For every year in the 20-year projection, passive investment management and non-investment expenses are deducted from the expected return to account for the payment of expenses from the Plan. We assume the additional cost of any active management activities is expected to be offset by additional returns over the expected returns shown above, and it is therefore not included in the analysis. The amount of annual expenses deducted from the expected return are outlined the following table.

Table C.8 – Annual Expenses Deducted From Projected Stochastic Returns

Expenses type	Annual expense
Passive investment management	0.10% of assets
Non-investment	\$850,000 in first year, increased with inflation in subsequent years

For the purpose of the stochastic analysis, the funding policy valuation discount rate remains fixed at 4.50% per annum throughout the projection period. The funding policy valuation discount rate is used to project the funding policy valuation liability and determine the present value of excess contributions throughout the projection period. The projection of the liability and future cash flows under the stochastic analysis uses the same demographic assumptions as used for the calculation of the funding policy valuation liability, as required under paragraph 15(2)(c) of Regulation 2012-75.

Stochastic Model Projection Outputs

The following tables were prepared using the outputs of the stochastic projection model. They represent key portfolio statistics of return on assets net of investment expenses, total funding policy valuation liabilities, total market value of assets, and open group funded ratio. The distribution of results is summarized by the use of percentiles, mean, standard deviation, and Conditional Tail Expectation (“CTE”). The CTE reflects the average result of the worst-case scenarios for the indicated percentile.

The summary statistics shown in Table C.9 below for the Fund return are shown for each year as well as over a 20-year period.

Table C.9 – Distribution of Projected Fund Return (Net of Passive Investment Expenses)

Plan Year (January 1 / December 31)	2.5% CTE	5% CTE	5th Percentile	25th Percentile	50th Percentile	75th Percentile	95th Percentile	Mean	Standard Deviation
2022	-9.39%	-7.74%	-5.09%	0.95%	5.13%	9.22%	15.41%	5.12%	6.21%
2023	-8.80%	-7.30%	-4.93%	0.90%	5.10%	9.21%	15.33%	5.12%	6.15%
2024	-8.81%	-7.11%	-4.49%	1.18%	5.33%	9.55%	15.37%	5.39%	6.10%
2025	-8.57%	-6.96%	-4.56%	1.29%	5.37%	9.47%	15.51%	5.41%	6.10%
2026	-8.50%	-6.88%	-4.41%	1.46%	5.36%	9.38%	15.48%	5.44%	6.00%
2027	-8.53%	-6.86%	-4.39%	1.29%	5.59%	9.66%	15.52%	5.53%	6.10%
2028	-8.46%	-6.83%	-4.31%	1.50%	5.70%	9.63%	15.71%	5.61%	6.08%
2029	-8.12%	-6.55%	-4.11%	1.67%	5.71%	9.79%	15.99%	5.75%	6.05%
2030	-8.31%	-6.66%	-4.22%	1.63%	5.76%	9.77%	15.48%	5.70%	6.00%
2031	-7.70%	-6.13%	-3.72%	2.36%	6.48%	10.67%	16.55%	6.50%	6.14%
2032	-8.00%	-6.30%	-3.70%	2.31%	6.45%	10.40%	16.45%	6.39%	6.09%
2033	-7.77%	-6.10%	-3.56%	2.20%	6.28%	10.39%	16.36%	6.32%	6.06%
2034	-7.70%	-5.95%	-3.40%	2.29%	6.41%	10.43%	16.44%	6.42%	6.06%
2035	-7.83%	-6.09%	-3.55%	2.14%	6.38%	10.52%	16.47%	6.38%	6.10%
2036	-7.65%	-5.98%	-3.42%	2.27%	6.34%	10.47%	16.56%	6.40%	6.07%
2037	-7.70%	-5.96%	-3.37%	2.23%	6.41%	10.58%	16.50%	6.43%	6.10%
2038	-7.64%	-6.03%	-3.59%	2.30%	6.34%	10.39%	16.37%	6.35%	6.05%
2039	-7.62%	-6.08%	-3.68%	2.31%	6.49%	10.52%	16.48%	6.44%	6.10%
2040	-7.63%	-5.91%	-3.42%	2.35%	6.40%	10.48%	16.56%	6.44%	6.04%
2041	-7.87%	-6.27%	-3.82%	2.31%	6.41%	10.58%	16.49%	6.38%	6.13%
Annualized average over 20 years	2.93%	3.29%	3.81%	4.98%	5.79%	6.63%	7.81%	5.81%	1.22%

The stochastic model projects a distribution of the total funding policy valuation liabilities for the portfolio over the projection period. The liabilities include the value of cost-of-living adjustments granted up to each respective valuation year, and exclude any reduction in past base benefits.

Table C.10 – Distribution of Projected Total Funding Policy Valuation Liability (\$ thousands)

Date	2.5% CTE*	5% CTE*	5th Percentile	25th Percentile	50th Percentile	75th Percentile	95th Percentile	Mean	Standard Deviation
2022-12-31	768,198	768,322	768,620	768,620	768,620	768,620	768,620	768,608	74
2023-12-31	767,283	767,610	768,253	791,751	798,348	804,678	814,249	797,780	11,809
2024-12-31	765,034	772,302	783,523	808,532	823,600	836,676	856,492	821,973	23,674
2025-12-31	765,524	773,326	783,600	818,599	845,740	866,295	898,517	843,220	35,202
2026-12-31	766,032	773,227	783,651	829,342	864,043	894,108	935,346	862,214	45,856
2027-12-31	765,180	772,520	785,036	838,650	880,920	920,357	969,416	879,488	55,877
2028-12-31	763,757	771,982	788,050	847,050	896,733	943,596	1,000,894	895,600	65,094
2029-12-31	762,676	772,266	789,521	854,196	912,324	966,396	1,029,021	910,904	73,947
2030-12-31	760,309	771,043	789,925	861,682	927,990	987,897	1,057,821	925,492	82,587
2031-12-31	758,429	770,478	790,027	869,697	942,856	1,007,480	1,082,898	939,558	90,750
2032-12-31	757,387	770,266	792,517	878,869	958,699	1,028,285	1,108,940	954,260	98,585
2033-12-31	755,657	769,866	793,941	886,838	973,632	1,049,409	1,135,272	969,030	106,100
2034-12-31	754,345	769,644	795,889	897,012	990,401	1,069,921	1,161,192	984,258	113,644
2035-12-31	753,546	769,406	797,119	907,826	1,006,820	1,091,716	1,188,382	1,000,023	121,032
2036-12-31	752,487	769,995	800,420	917,967	1,024,027	1,112,804	1,212,278	1,015,211	127,987
2037-12-31	751,381	769,968	801,423	927,909	1,039,278	1,133,780	1,236,990	1,030,195	134,885
2038-12-31	750,533	770,539	805,288	937,494	1,056,247	1,153,383	1,261,429	1,045,198	141,255
2039-12-31	750,418	771,924	808,346	948,422	1,071,851	1,172,795	1,285,836	1,060,128	147,438
2040-12-31	750,484	772,843	811,298	959,554	1,087,302	1,192,362	1,307,780	1,075,300	153,432
2041-12-31	751,563	775,395	816,017	971,585	1,106,331	1,211,502	1,331,341	1,090,881	158,780

**Note that the CTE is calculated on the lowest liability scenarios, since scenarios where the liability is reduced due to the funding deficit recovery plan represent scenarios that have had more negative investment returns.*

The stochastic model produces a distribution of the market value of assets over the projection period. The following table shows a summary of the projected distribution for each year.

Table C.11 – Distribution of Projected Market Value of Assets (\$,000)

Date	2.5% CTE	5% CTE	5th Percentile	25th Percentile	50th Percentile	75th Percentile	95th Percentile	Mean	Standard Deviation
2022-12-31	720,418	733,632	754,834	803,429	837,009	869,899	919,460	836,853	49,797
2023-12-31	706,446	722,936	748,134	812,105	857,440	905,618	977,243	859,608	69,597
2024-12-31	695,690	715,576	747,316	824,669	881,342	939,112	1,034,079	884,302	86,306
2025-12-31	689,303	712,979	749,124	839,239	905,772	974,142	1,085,631	909,586	102,334
2026-12-31	689,909	715,566	753,416	853,042	930,145	1,011,236	1,137,807	935,599	117,423
2027-12-31	688,678	716,722	761,096	869,748	956,030	1,048,338	1,191,545	963,110	132,254
2028-12-31	681,227	710,274	755,916	876,731	974,597	1,078,466	1,239,020	982,801	148,039
2029-12-31	673,434	705,170	753,190	882,868	988,661	1,106,095	1,288,412	1,000,455	163,615
2030-12-31	663,957	697,744	751,658	890,280	1,004,077	1,128,923	1,342,176	1,017,552	179,309
2031-12-31	664,833	699,074	751,956	899,339	1,025,551	1,164,627	1,391,104	1,042,236	196,514
2032-12-31	665,242	700,744	756,217	912,193	1,044,228	1,194,884	1,452,620	1,066,057	213,636
2033-12-31	661,039	699,472	759,484	925,270	1,064,247	1,226,620	1,504,382	1,089,479	231,660
2034-12-31	660,260	700,168	762,664	936,690	1,084,525	1,261,196	1,564,056	1,114,338	249,458
2035-12-31	659,339	700,631	765,075	947,782	1,104,815	1,292,134	1,630,332	1,139,636	268,945
2036-12-31	659,598	702,254	769,296	956,899	1,124,849	1,330,166	1,697,215	1,164,858	288,568
2037-12-31	658,543	703,009	774,940	967,535	1,143,457	1,366,738	1,768,826	1,190,730	308,612
2038-12-31	655,723	705,215	780,552	979,991	1,159,135	1,402,112	1,850,250	1,216,709	331,849
2039-12-31	654,930	705,939	783,321	991,622	1,182,709	1,436,437	1,922,031	1,244,249	354,476
2040-12-31	657,194	708,274	786,574	1,005,344	1,207,682	1,470,155	1,982,824	1,272,059	374,373
2041-12-31	661,482	713,728	794,873	1,018,731	1,225,928	1,507,733	2,069,969	1,300,466	397,236

The stochastic model produces a distribution of the open group funded ratio over the projection period. The following table shows a summary of the projected distribution for each year, before any corrective action required under the funding deficit recovery plan of the Funding Policy.

Table C.12 – Distribution of Projected Open Group Funded Ratio

Date	2.5% CTE	5% CTE	5th Percentile	25th Percentile	50th Percentile	75th Percentile	95th Percentile	Mean	Standard Deviation
2022-12-31	110%	112%	115%	121%	126%	130%	136%	126%	6%
2023-12-31	106%	108%	111%	118%	123%	128%	136%	123%	8%
2024-12-31	103%	105%	108%	116%	121%	127%	135%	121%	8%
2025-12-31	100%	103%	106%	114%	120%	125%	135%	120%	9%
2026-12-31	98%	101%	105%	113%	119%	125%	134%	119%	9%
2027-12-31	97%	99%	104%	112%	118%	125%	134%	119%	10%
2028-12-31	95%	98%	103%	112%	118%	125%	136%	119%	10%
2029-12-31	94%	97%	102%	112%	118%	125%	137%	119%	11%
2030-12-31	93%	97%	101%	112%	118%	125%	138%	119%	12%
2031-12-31	93%	97%	102%	112%	119%	126%	141%	120%	12%
2032-12-31	94%	97%	102%	113%	119%	127%	143%	121%	13%
2033-12-31	93%	97%	102%	113%	120%	127%	146%	121%	14%
2034-12-31	94%	97%	102%	113%	120%	128%	149%	122%	15%
2035-12-31	94%	97%	103%	113%	121%	129%	153%	123%	16%
2036-12-31	93%	97%	103%	114%	121%	129%	157%	124%	17%
2037-12-31	94%	98%	103%	114%	121%	130%	160%	124%	18%
2038-12-31	94%	97%	103%	114%	121%	131%	164%	125%	19%
2039-12-31	94%	98%	104%	114%	122%	131%	169%	126%	21%
2040-12-31	94%	98%	104%	115%	122%	132%	172%	127%	22%

The following table provides the projected cumulative indexing (or cost-of-living adjustments) granted over the years as a percentage of total cumulative inflation, as produced by the stochastic simulation.

Table C.13 - Projected Cumulative Indexing Granted as a Percentage of Cumulative Inflation

Date	2.5% CTE	5% CTE	5th Percentile	25th Percentile	50th Percentile	75th Percentile	95th Percentile	Mean	Standard Deviation
2022-12-31	100%	103%	107%	111%	114%	121%	159%	120%	20%
2023-12-31	94%	100%	107%	110%	113%	119%	143%	116%	14%
2024-12-31	75%	84%	100%	109%	112%	117%	134%	114%	13%
2025-12-31	62%	70%	84%	109%	112%	116%	130%	112%	15%
2026-12-31	53%	61%	75%	108%	111%	115%	127%	109%	16%
2027-12-31	45%	53%	67%	108%	111%	115%	125%	107%	18%
2028-12-31	38%	47%	61%	106%	111%	115%	123%	105%	19%
2029-12-31	32%	41%	56%	101%	111%	114%	122%	103%	21%
2030-12-31	26%	37%	53%	97%	110%	114%	121%	102%	22%
2031-12-31	23%	33%	50%	93%	110%	114%	120%	101%	23%
2032-12-31	21%	31%	48%	91%	110%	114%	120%	100%	24%
2033-12-31	18%	29%	46%	90%	110%	113%	119%	99%	24%
2034-12-31	17%	28%	44%	89%	110%	113%	119%	99%	25%
2035-12-31	15%	26%	43%	89%	110%	113%	119%	98%	25%
2036-12-31	13%	25%	43%	88%	110%	113%	119%	98%	26%
2037-12-31	12%	24%	43%	89%	110%	113%	118%	98%	26%
2038-12-31	11%	23%	42%	89%	110%	113%	118%	98%	25%
2039-12-31	9%	23%	43%	89%	110%	113%	118%	98%	25%
2040-12-31	9%	22%	43%	89%	110%	113%	118%	98%	25%
2041-12-31	8%	22%	44%	90%	111%	113%	118%	98%	25%

**Note that this table discloses the cumulative indexing provided throughout the projection period. In Table 2.2 the secondary risk management goal 1 is the mean of the cumulative indexing at the end of the projection period with a maximum value of 100% in each trial.*

The following table is the average correlation matrix for the asset classes outlined in Table C.3. The matrix represents the correlations between asset classes produced by the stochastic simulation.

Table C.14 – Average Correlation Among Asset Classes

Asset Classes	Inflation	ST	DLTC	DLTP	DC	GHY	CE	USE	IE	RE & M	I	PE	PD
Inflation	1.00	0.14	0.00	0.01	-0.09	0.02	0.15	-0.21	-0.12	0.38	0.10	-0.07	-0.09
ST		1.00	0.02	0.06	0.33	-0.10	0.00	0.00	0.00	0.00	0.00	0.00	0.34
DLTC			1.00	0.93	0.63	0.44	0.22	0.12	0.07	0.13	-0.27	0.18	0.60
DLTP				1.00	0.65	0.18	0.01	-0.03	-0.13	0.06	-0.28	0.01	0.64
DC					1.00	0.13	-0.06	-0.03	-0.12	-0.31	-0.25	-0.02	0.98
GHY						1.00	0.51	0.39	0.44	0.16	-0.09	0.41	0.12
CE							1.00	0.40	0.56	0.24	0.07	0.56	-0.06
USE								1.00	0.76	0.06	-0.11	0.61	-0.05
IE									1.00	0.22	-0.08	0.61	-0.13
RE & M										1.00	0.08	0.10	-0.31
I											1.00	-0.03	-0.25
PE												1.00	-0.02
PD													1.00

The disclosures in this report have been prepared in compliance with the Canadian Institute of Actuaries Standard of Practice, subsection 3270 - Disclosure for Stochastic Models Used to Comply with Specific Regulatory Pension Plan Funding Requirements.

Limitations of Analysis for Risk Management Tests

This report contains analyses and results that rely on assumptions about future events. While we believe that the model inputs and assumptions are reasonable at the time this report has been prepared, other reasonable model inputs and assumptions could be used, resulting in potentially very different distributions of forecasted outcomes.

Future events and actual experience will vary from the simulated outcomes produced with this analysis. As these differences arise, contribution levels and benefits payable under the Plan will be adjusted in accordance with the priorities set out under the Funding Policy. It is not possible or practical to reflect every variable in a model that is based in the real world. Therefore, we use summary information, estimates, and simplifications to facilitate the modeling of future events. We also exclude factors or data that we consider immaterial.

The results presented in this report are not intended nor should they be interpreted to represent a guarantee or warranty with respect to the future financial condition of the Plan. Furthermore, any determination of probabilities based on the model represent simulated outcomes and should not be interpreted as being actual probabilities.

Appendix D – Summary of Plan Provisions

The following is a brief summary of the main provisions of the City of Saint John Shared Risk Plan (“CSJ SRP Plan”) effective January 1, 2022. For an authoritative statement of the precise provisions of the CSJ SRP Plan, reference must be made to the official CSJ SRP Plan documents.

Introduction

Effective January 1, 2013, the Former CSJ Plan was converted to the CSJ SRP Plan. The administration of the CSJ SRP Plan continues to be the responsibility of an independent Board of Trustees.

The primary purpose of the CSJ SRP Plan is to provide pensions to eligible employees after retirement and until death in respect of their service as employees. The purpose of the CSJ SRP Plan is to provide secure benefits to members of the plan without an absolute guarantee but with a risk focused management approach delivering a high degree of certainty that Base Benefits can be met in the vast majority of potential future economic scenarios.

All future cost of living adjustments for current and future retirees and other ancillary benefits under the CSJ SRP Plan shall be provided only to the extent that funds are available for such benefits, as determined by the Board of Trustees in accordance with applicable laws and the CSJ SRP Plan’s Funding Policy.

Base and ancillary benefits can also be reduced. Therefore, they are not “guaranteed” benefits.

The benefits can only be met if contributions and plan experience, most importantly investment performance, allow this to happen. The triggers and timing of any potential benefit reductions would be administered by Board of Trustees, subject to applicable laws and the CSJ SRP Plan’s Funding Policy.

Eligibility and Participation

Each member of the Former CSJ Plan joins the CSJ SRP Plan on January 1, 2013.

Each employee who commences full-time employment on or after January 1, 2013 is required to join the CSJ SRP Plan from the first day of the month coincident with or next following the date of employment. Each part-time employee is eligible to join when they meet the minimum requirements under the PBA. However, such part-time employees are now required to join when they meet the eligibility requirements effective January 1, 2015.

Required Contributions

Effective January 1, 2013, each regular member is required to contribute 9.0% of earnings. Each police and fire member is required to contribute 12.0% of earnings. The City of Saint John contributes 11.4% of earnings on behalf of regular members, and 15.2% on behalf of police and fire members. In addition, the City of Saint John contributes additional temporary contributions of 17.0% of earnings from April 1, 2013 to March 31, 2028.

Contributions are waived for periods during which a member is in receipt of long term disability benefits from a long-term disability plan sponsored by the City until recovery or age 65. Pensionable service continues to accrue in respect of such periods, using pensionable earnings earned by other employees in the same employment classification as the member, subject to limits on deemed earnings imposed under the Income Tax Act.

Contribution rates are subject to change in accordance with triggers found under the Funding Policy for the CSJ SRP Plan.

Normal Retirement

The normal retirement date is the first day of the month coincident with or next following the member's sixty-fifth birthday.

A member's annual normal retirement pension is equal to the sum of:

(A) In respect of service before January 1, 2013, the product of:

- (i) the number of years of the member's pensionable service before January 1, 2013, and
- (ii) 2.0% of the annual average of the best three (3) consecutive years of earnings at January 1, 2013;

and

(B) In respect of service from January 1, 2013, 1.8% of the member's earnings for each calendar year.

Pensions accrued above are subject to cost-of-living adjustments, before and after retirement, every January 1st following January 1, 2013, subject to approval by the Board of Trustees, and in accordance with the trigger requirements found under the Funding Policy for the CSJ SRP Plan.

The cost-of-living adjustments granted up to and including January 1, 2022 under “Other Actions”, Steps 1 and 2, of the Funding Excess Utilization Plan of the Funding Policy are related to increases in the Consumer Price Index and are as follows:

Effective Date	Applicable To Benefits Accrued As Of	COLA Granted
January 1, 2014	January 1, 2013	0.40%
January 1, 2015	January 1, 2013	1.05%
January 1, 2015	January 1, 2014	0.90%
January 1, 2016	January 1, 2013	0.05%
January 1, 2016	January 1, 2015	1.95%
January 1, 2017	January 1, 2016	1.12%
January 1, 2018	January 1, 2017	1.42%
January 1, 2019	January 1, 2018	1.56%
January 1, 2020	January 1, 2019	2.30%
January 1, 2021	January 1, 2020	1.95%
January 1, 2022	January 1, 2021	0.74%

Further cost-of-living adjustments to accrued pensions of active and disabled members granted up to and including January 1, 2022 under “Other Actions”, Step 3, of the Funding Excess Utilization Plan of the Funding Policy are related to increases in average wage that are in excess of increases in the Consumer Price Index and are as follows:

Effective Date	Applicable To Benefits Accrued As Of	COLA Granted
January 1, 2016	January 1, 2013	1.00%
January 1, 2016	January 1, 2014	0.88%
January 1, 2016	January 1, 2015	0.69%
January 1, 2017	January 1, 2016	0.66%
January 1, 2021	January 1, 2020	0.53%
January 1, 2022	January 1, 2021	6.03%

Normal, Automatic and Optional Forms of Pension

The normal form of pension is a pension payable in equal monthly installments commencing on the member's pension commencement date and continuing thereafter during the lifetime of the member, subject to a guarantee that the member's contributions with interest will at least be paid in total.

For a member with a spouse or common-law partner, the automatic form of pension is a joint and survivor pension which is payable in equal monthly installments for the life of the member and payable to the member's spouse or common-law partner after the member's death at 60% of the amount paid to the member.

A member can also elect to receive an optional form of pension providing a survivor pension of 100% to his/her spouse or a lifetime pension with a 15 year guarantee on an actuarially equivalent basis.

Any form of pension in effect before the Conversion Date for individuals who retired before the Conversion Date will remain in effect.

Vesting Date

A member is considered vested when he/she has reached five (5) years of continuous employment or two (2) years of plan membership. Those who had reached their vesting date under the Former CSJ Plan at January 1, 2013 were grandfathered under the CSJ SRP Plan.

Early Retirement

Early retirement is permitted on or after age 55 if the member has reached his/her vesting date. For those who were members of the Former CSJ Plan, they can also retire early when the sum of age and pensionable service (counting also pensionable service after the Conversion Date) reaches 85, if earlier.

The portion of the lifetime pension accrued for service before January 1, 2013 is reduced as follows:

- if the member is eligible for an immediate pension at termination of employment:
 - 5/12% per month (5.0% per year) that pension commences before attainment of age 65, or if earlier when the member would have reached 85 points had he continued in employment.
- if the member is not eligible for an immediate pension at termination of employment:
 - 5/12% per month (5.0% per year) that pension commences before attainment of age 65.

The portion of the lifetime pension accrued for service between January 1, 2013 and December 31, 2020 is reduced as follows:

- if the member's age and pensionable service index at the date of termination of employment is less than 85 points:
 - 5/12% per month (5.0% per year) that the pension commences before the date the Member would have reached 85 Points had the Member continued in employment after the Member's termination of employment and until pension commencement date, or attainment of age 65 (or age 60 for members in public safety occupations).
- if the member's age and pensionable service index at the date of termination of employment is 85 points or higher:
 - no early reduction applicable for this period of service

The portion of the lifetime pension accrued for service on and after January 1, 2021 is reduced by 1/2% per month (6.0% per year) that the pension commences before attainment of age 65 (or age 60 for members in public safety occupations).

Benefits on Termination of Employment

If a member terminates employment prior to his/her vesting date, the member is entitled to a refund of the total amount of his/her own contributions with interest.

If a member terminates employment before being eligible for an immediate pension, but after his/her vesting date, the member may elect to receive:

- (i) a deferred lifetime pension payable from normal retirement date equal to the accrued pension to which the member is entitled as at his/her date of termination in accordance with the formula specified above for the normal retirement pension; or
- (ii) to transfer the termination value of the deferred lifetime pension calculated in accordance with the PBA, to another pension plan, a prescribed retirement savings arrangement, or an insurance company, as allowed under the PBA.

The Termination Value will not be less than a member's own contributions with interest.

Death Benefits

If a member dies prior to his/her vesting date, the benefit payable is a refund of the member's own contributions with interest.

If the member dies after his/her vesting date but before pension commencement, the following benefits will be paid:

- for service before January 1, 2013:
 - 60% of the accrued pension for such service at death is first payable to the surviving spouse or common-law partner; dependent pensions for such service may also be payable to eligible dependents, if there is no spouse; and additional benefits may be payable if the death is as a result of an accident, pro-rated for such service. The value of the death benefits is not to be less than the Termination Value of the accrued pension for such service at death.
- for service on and after January 1, 2013:
 - the Termination Value, as defined under the PBA, will be refunded to the member's spouse or common law partner, or to the beneficiary if there is no spouse or common law partner. The Termination Value will not be less than a member's own contributions with interest.

In the event of death after pension commencement, the benefit payable is determined in accordance with the form of pension selected by the member at retirement.

Appendix E – Summary of Funding Policy

The following is a brief summary of the main provisions of the Funding Policy for the City of Saint John Shared Risk Plan (“CSJ SRP Plan”) effective January 1, 2022. For an authoritative statement of the precise provisions of the Funding Policy, reference must be made to the official document.

Purpose of Plan and Funding Policy

The purpose of the CSJ SRP Plan is to provide secure pension benefits to members and former members without an absolute guarantee, but with a risk focused management approach delivering a high degree of certainty that base benefits can be met in the vast majority of potential future economic scenarios.

The primary focus is to provide a highly secure lifetime pension at normal retirement age. However, the intention is that additional benefits may be provided depending on the financial performance of the Plan.

The Funding Policy is the tool used by the Board of Trustees to manage the risks inherent in a shared risk plan. The Funding Policy provides guidance and rules regarding decisions that must, or can, be made by the Board of Trustees around funding levels, contributions and benefits.

Benefit Objectives

Upon conversion, accrued pension for all members are maintained. Benefits to retirees and survivors continue at the same level, but future indexing becomes contingent on the ability of the CSJ SRP Plan to pay such benefits. Accrued benefits for active members are calculated at conversion date and are increased on a contingent basis similar to retirees rather than continuing to use a final average earnings formula. Early retirement rules for service before the conversion date are maintained.

Benefit accruals under the Plan after the conversion is at 1.8% of earnings (not including overtime) and are payable at normal retirement age of 65 (age 60 for police and fire employees) with a 6% per year reduction for early retirement. This change reflects anticipated continued increases in life expectancy. The overall plan design objective with respect to retirement age is to provide each cohort of plan members with about the same expected number of years of pension payments for a similar amount of pension in current dollars at retirement. None of the above are guarantees.

Risk Management

In accordance with legislation on shared risk plans, the primary risk management goal is to achieve a 97.5% probability that base benefits will not be reduced over the following 20 years.

In addition, secondary risk management goals are to provide, on average, contingent indexing on base benefits (for all members) in excess of 75% of CPI over the next 20 years, and to achieve at least a 75% probability that the ancillary benefits described in the Plan text at conversion can be provided over the next 20 years.

Contributions

The initial employee contribution rate shall be 9% of earnings for all employees other than police and fire employees in Public Safety Occupations. The initial Employee contribution rate shall be 12% of earnings for police and fire Employees in Public Safety Occupations (provided that Employees who were formerly employed in a Public Safety Occupation before accepting a non-unionized position may elect to contribute at this rate in accordance with the Plan text), subject to the ITA.

Contribution adjustments may be made by the Board of Trustees. The Board of Trustees must trigger an increase in the Initial Employee contribution rate of 25% (capped at 2.75% of earnings) if the open group funded ratio of the Plan, as defined by the PBA, falls below 100% for two successive year ends (before taking into account any initial contribution rates increase), until such time as the open group funded ratio reaches 105% without considering the effect of the contribution increase and the primary risk management goal is met.

A reduction in employee contributions of up to a total of 1.5% of earnings can be triggered by the Board of Trustees if the conditions set forth in the funding excess utilization plan are met.

All employee increases and decreases described above are also applied to the initial employer contributions.

Commencing April 1, 2013, the Employer is required to make temporary contributions at the rate of 17% of earnings of all Employees. The temporary contributions shall cease on April 1, 2028 or when the Plan achieves an open group funded ratio, as defined in the PBA, of 150%, provided that such temporary contributions shall not cease before April 1, 2023, subject to the ITA.

Funding Deficit Recovery Plan

The funding deficit recovery plan must be implemented by the Board of Trustees if the open group funded ratio of the Plan falls below 100% for two successive plan year ends.

The funding deficit recovery plan consists of the following actions in the order of priority as listed below:

1. Increase initial contribution rates as stipulated in Section IV of the Funding Policy;
2. Change early retirement rules for post-conversion service for members who are not yet eligible to retire and receive an immediate pension under the terms of the Plan to a full actuarial reduction for retirement before age 65 for all Employees other than police and fire Employees who are employed in Public Safety Occupations and for retirement before age 60 for police and fire Employees who are employed in Public Safety Occupations;
3. Reduce base benefit accrual rates for future service after the date of implementation of the deficit recovery plan by not more than 5%;
4. In addition to the reduction in step 3 above, reduce base benefits on a proportionate basis for all members regardless of membership status for both past and future service in equal proportions.

The above actions shall be taken one by one until such time as the funding goals under the Regulation are met.

The base benefit reduction in point 4, if required, shall be such that the funding goals under the Regulation for such purposes are achieved.

Action items under steps 1 to 3 shall take effect no later than 12 months following the date of the funding policy valuation report that triggered the need for the change, and actions under step 4 shall take effect no later than 18 months following the date of the funding policy valuation report that triggered the need for the actions.

Funding Excess Utilization Plan

The funding excess utilization plan describes the actions the Board of Trustees must take or consider when the open group funding levels exceeds 105%. If the open group funding level is at 105% or less or initial contribution rate increases are in effect, there are no actions that can be taken under the funding excess utilization plan.

The excess available for utilization is as follows:

- 1/5th of the funds that make up the excess of the open group funding level at the valuation date (to a maximum of 140%) over 105%; PLUS
- 100% of the excess above 140%.

If base benefits and/or ancillary benefits have been reduced, all excess available for utilization must first be used to reinstate those reductions. Afterwards, the following actions are to be taken in the following order of priority and no action can be taken until the immediately preceding action in the list below has been fully implemented:

1. Provide indexing of base benefits up to the increase in the average Consumer Price Index (CPI) for Canada for the 12-month period preceding the date of the funding policy valuation report over the average of the CPI for the immediately preceding 12-month period. The indexation percentage applied to base benefits shall be the same for all members.
2. Provide indexing of base benefits for all members for every year that was missed or only partially covered since the Conversion Date, starting with the oldest period for which less than the full increase in the average CPI was provided up to the most recent in chronological order.
3. Provide a further increase to benefits of members for a period while they were not in receipt of a pension that is before the funding policy valuation date that triggered the action up to the rate of increase in the average wage as determined under the ITA and subject to Section 8504 of the regulations to the ITA; provided that no such increase would result in a requirement to calculate Past Service Pension Adjustments.
4. Provide for unreduced early retirement benefits not more generous than the Pre-Conversion Plan unreduced early retirement rules.
5. Provide for other ancillary benefits up to those that are comparable to the ancillary benefits under the Pre-Conversion Plan.
6. Establish a reserve to cover the next 10 years of potential contingent indexing based on CPI.
7. Apply contribution adjustments of up to 3%, as allowed under Section IV of the Funding Policy.

Actions 1 to 6 can be applied with excess funds available. If all improvements from 1 through 6 above have been made and the open group funded ratio is still in excess of 150%, then action 7 can be undertaken. After such actions have been undertaken, the Trustees may consider permanent benefit changes subject to the approval of the Employer and Unions and subject to most members being able to benefit from the changes.

Except for the timing of contribution reductions, the timing of the above actions shall be the first of the year that is 12 months after the date of the funding policy valuation report that triggered the actions.

Actuarial Assumptions

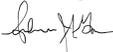
A funding policy actuarial valuation shall be conducted by the Plan's actuary at January 1st of each year. The discount rate is 4.5% per year. The discount rate can be changed at a future valuation with the consent of the City and the Unions. Other assumptions may be changed as experience evolves.

Appendix F – Plan Administrator Confirmation Certificate

With respect to the Actuarial Valuation Report as at January 1, 2022 of the City of Saint John Shared Risk Plan (CSJ SRP Plan), I hereby confirm that to the best of my knowledge:

- the data regarding the CSJ SRP Plan members and beneficiaries provided to LifeWorks as at January 1, 2022 constitutes a complete and accurate description of the information in the plan files;
- copies of the official CSJ SRP Plan documents, Funding Policy, Statement of Investment Policies and Goals and all amendments to date were provided to LifeWorks; and
- there are no events subsequent to January 1, 2022, other than those already identified in this report, which would materially affect the results of the valuation.

The CSJ SRP Plan Board of Trustees

<small>DocuSigned by:</small>  <small>B5A3DD03312845D</small>	<small>DocuSigned by:</small>  <small>B7A3CBBFF43049E...</small>
<i>Signature</i>	

Andrew Green

Fred Slipp

Name (printed)

Director

Director

Title

9/28/2022

9/28/2022

Date



Improving lives, improving business.

LifeWorks is a global leader in delivering technology-enabled solutions that help clients support the total wellbeing of their people and build organizational resiliency. By improving lives, we improve business. Our solutions span employee and family assistance, health and wellness, recognition, pension and benefits administration, retirement and financial consulting, actuarial and investment services. LifeWorks employs approximately 7,000 employees who work with some 24,000 client organizations that use our services in more than 160 countries. LifeWorks is a publicly traded company on the Toronto Stock Exchange (TSX: LWRK). For more information, visit lifeworks.com.

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