Shared Risk Plan for CUPE Employees of New Brunswick Hospitals

Actuarial Valuation Report as at December 31, 2019

Report prepared in October 2020

Registration number: Canada Revenue Agency #0385849

NB Superintendent of Pensions: NB 0385849

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Introduction

The Pension Plan for CUPE Employees of New Brunswick Hospitals ("Former CUPE Plan") was converted to the Shared Risk Plan for CUPE Employees of New Brunswick Hospitals ("CUPE SRP Plan") effective July 1, 2012.

This valuation is conducted as at December 31, 2019 for the Board of Trustees ("Trustees") and the Superintendent of Pensions ("Superintendent") for the following purposes:

- to document the results of a 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 CUPE SRP Plan as required under the Canadian Institute of Actuaries' Standards of Practice, 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, 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 CUPE SRP Plan retained the services of Morneau Shepell Ltd ("Morneau Shepell") to prepare this report.

The last actuarial valuation report prepared for the CUPE SRP Plan was performed as at December 31, 2018.

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

The funding policy valuation assumptions have been updated as follows:

- The long-term inflation assumption is 2.10% per annum, which is 0.15% per annum lower than the assumption used for the actuarial valuation as at December 31, 2018. Correspondingly, the assumed future salary increases are 2.60% per annum which is also 0.15% per annum lower than the assumption used for the actuarial valuation as at December 31, 2018.

These changes are described in more detail in Section 1 of this report.

The next actuarial valuation report for the CUPE SRP Plan will be due no later than one year following the effective date of this report in accordance with the requirements of subsection 100.61(1) of the PBA.

Subsequent Events

On March 11, 2020, the World Health Organization declared that COVID-19 was a pandemic. This public health crisis caused significant economic and social disruptions worldwide.

- The COVID-19 pandemic resulted in higher deaths for the population in general as measured by public health officials. The effect of the outbreak on the mortality incidence for 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 the experience emerges.
- Economic conditions have also changed with a significant reduction in asset values and strained liquidity occurring in the month of March. Sustained lowered economic activity could also impact the Plan's economic assumptions. No adjustments on the Plan assets nor to any of the economic assumptions have been made or anticipated in this report.

On January 24, 2020, the Actuarial Standards Board of the Canadian Institute of Actuaries ("CIA") released its changes to the standards of practice for calculating the commuted values of pension plans. The revised standards are to take effect on December 1, 2020 for calculating commuted values for plans that are not target pension arrangements. These changes do not impact the financial situation of the Plan other than potentially the hypothetical wind-up liability.

To our knowledge, there are no other events subsequent to the valuation date which would materially impact the results of the valuation.

Changes since last valuation

The following benefit improvements under the Funding Excess Utilization Plan were awarded following the December 31, 2018 valuation, are effective 12 months after the valuation date and are included in this valuation:

- Step 1 – A cost of living increase of 2.12% was applied to all accrued pensions and pensions in payment.
- Step 2 – 100% of additional increase necessary to provide all active members a lifetime benefit calculated using a 5-year final average benefit formula at December 31, 2018.
- Step 3 – 100% of additional increase necessary to provide all members receiving a pension at December 31, 2018 a lifetime benefit calculated using a 5-year final average benefit formula at their individual date of retirement. As Step 3 was granted a year prior, only members who retired in 2018 are affected.
- Step 4 – Retroactive lump sum payment necessary to provide all members receiving a pension at December 31, 2018 a lifetime benefit calculated using a 5-year final average benefit formula at their individual date of retirement, retroactive to their pension start date. As Step 4 was granted a year prior, only members who retired in 2018 are affected.

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 procedures results, which in turn will impact the types and timing of any actions to be

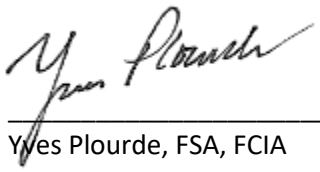
taken by the Trustees in accordance with the Funding Policy. These gains and losses will be revealed in future actuarial valuations.

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. 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 Morneau Shepell, unless and only to the extent otherwise provided by applicable law.

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

Respectfully submitted,



Yves Plourde, FSA, FCIA

November 2, 2020
Date

This report was peer reviewed by Daniel Dine, FSA, FCIA.

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 CUPE SRP Plan as at December 31, 2019 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 Funding Policy summarized in Appendix E of this report. The methods and assumptions used in the funding policy actuarial valuation are described later in this section.

Funding Policy Valuation Funded Status

The funding policy valuation funded status of the CUPE 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 Plan continues indefinitely. The funding policy valuation funded status of the CUPE SRP Plan as at December 31, 2019, along with the results in the previous valuation as at December 31, 2018 are found below:

Table 1.1 – Funding Policy Valuation Funded Status

	December 31, 2019	December 31, 2018
	$	$
Market Value of Assets		
• Fair market value of assets (including receivables / payables)	1,002,480,000	$896,707,000
Funding Policy Actuarial Liabilities		
• Active members	408,043,000	401,328,000
• Terminated and suspended members	86,954,000	75,500,000
• Retired members and beneficiaries	570,883,000	540,177,000
• Outstanding refunds	117,000	1,135,000
• Total funding policy valuation actuarial liabilities	1,065,997,000	1,018,140,000
Funding policy valuation excess (unfunded liability)	(63,517,000)	(121,433,000)
Termination value funded ratio [calculated in accordance with paragraph 14(6)(e) of Reg. 2012-75]	94.0%	88.1%

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 CUPE 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, being 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 Plan in excess of the funding policy valuation normal cost. Results for the year following December 31, 2019 are presented below, along with the results found in the previous valuation as at December 31, 2018.

Table 1.2 – Funding Policy Valuation Normal Cost and Excess Contributions

	Year Following December 31, 2019		Year Following December 31, 2018	
	$	% of payroll	$	% of payroll
A. Member and employer contributions	64,663,000	19.1%	64,624,000	19.1%
B. Funding policy valuation normal cost	35,936,000	10.6%	36,199,000	10.7%
C. Excess contributions (A. – B.)	28,727,000	8.5%	28,425,000	8.4%
Estimated payroll for year following	338,550,000		338,343,000	

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 by the funding policy to determine the actions to be undertaken by the Trustees under the funding policy deficit recovery plan and the funding policy excess utilization plan. The 15-year open group funded ratio is calculated as follows as at December 31, 2019, along with the results found in the previous valuation as at December 31, 2018.

Table 1.3 – 15-Year Open Group Funded Ratio

	December 31, 2019	December 31, 2018
A. Market value of assets (including receivables / payables)	1,002,480,000	896,707,000
B. Present Value of Excess Contributions over next 15 years [calculated in accordance with Reg. 14(6)(c)]	362,047,000	361,267,000
C. Funding policy valuation actuarial liabilities	1,065,997,000	1,018,140,000
D. 15-Year Open Group Funded Ratio [(A. + B.) / C.]	128.0%	123.6%

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 December 31, 2018 and this funding policy valuation as at December 31, 2019:

Table 1.4 – Reconciliation of Funded Status

	$	$
Funding policy valuation excess (unfunded liability) as at December 31, 2018		(121,433,000)
Expected changes in funded status		
• Interest on funding excess (unfunded liability)	(5,464,000)	
• Excess contributions (shortfall) over normal cost	28,985,000	
• Cost of implementation of Steps 1 to 5 effective January 1, 2020	(21,941,000)	
• Total		1,580,000
Expected funding policy valuation excess (unfunded liability) as at December 31, 2019		(119,853,000)
Actuarial gains (losses) due to the following factors:		
• Investment return on actuarial value of assets	54,477,000	
• Retirements	1,691,000	
• Terminations	(2,160,000)	
• Mortality	1,156,000	
• Data corrections	(254,000)	
• Administrative expenses	(253,000)	
• Miscellaneous factors	170,000	
• Total		54,827,000
Change in actuarial assumptions		1,509,000
Funding policy valuation excess (unfunded liability) as at December 31, 2019		(63,517,000)

Reconciliation of Total Normal Cost

The factors contributing to the change in the total normal cost from the last funding policy valuation as at December 31, 2018 to this funding policy valuation as at December 31, 2019 are shown below:

Table 1.5 – Reconciliation of Total Normal Cost

	% of payroll
Total normal cost as at December 31, 2018:	10.7%
Impact of changes in demographics:	(0.1%)
Impact of changes in actuarial assumptions:	0.0%
Total normal cost as at December 31, 2019:	10.6%

Funding Policy Valuation 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 total 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 or other adjustments as may be granted from time to time by the Trustees in accordance with the plan terms 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 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 Valuation Actuarial Assumptions

The main actuarial assumptions employed for the funding policy actuarial valuation are summarized in the following table. The salary increase assumption and the YMPE increase assumption used in this valuation are different from the ones used in the previous valuation, however all other assumptions remain the same.

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 among other things the open group funded ratio of the 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 Valuation Actuarial Valuation Assumptions

	December 31, 2019
Discount rate	4.50% per annum
Salary increase for year following valuation (for normal cost purposes only, and inclusive of promotional increases)	2.60% per annum (2.75% per annum as of December 31, 2018)
YMPE increase for year following valuation (for normal cost purposes only)	2.60% per annum (2.75% per annum as of December 31, 2018)
Mortality	2014 Public Sector Mortality Table (CPM2014Publ) projected with Improvement Scale B (CPM-B) with size adjustment factors of 131% for males and 123% for females

Retirement

	Age at Conversion								
Retirement Age	Under 25 or joined Plan after conversion date	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60+
55	0%	0%	0%	0%	0%	0%	0%	12.5%	25%
56	0%	0%	0%	0%	0%	12.5%	25%	15%	5%
57	0%	0%	0%	12.5%	25%	15%	5%	5%	5%
58	0%	12.5%	25%	15%	5%	5%	5%	5%	5%
59	25%	15%	5%	5%	5%	5%	5%	5%	5%
60	5%	5%	5%	5%	5%	5%	5%	17.5%	30%
61	5%	5%	5%	5%	5%	17.5%	30%	17.5%	5%
62	5%	5%	5%	17.5%	30%	17.5%	5%	5%	5%
63	5%	17.5%	30%	17.5%	5%	5%	5%	5%	5%
64	30%	17.5%	5%	5%	5%	5%	5%	5%	5%
65	25%	22.5%	20%	17.5%	15%	12.5%	10%	7.5%	5%

Termination (membership) Sample rates of termination other than by death, disability or retirement	Age	Both Genders
	20	8.8%
	25	8.2%
	30	7.2%
	35	6.3%
	40	5.3%
	45	4.4%
	50	3.4%
	55	0%
	Assume 25% will elect a lump sum payout, 75% will elect a deferred pension	
Expenses	A 5% loading is added to the total normal cost to cover non-investment administration expenses payable from the fund	

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, Morneau Shepell believes that the expected long-term annual rate of inflation should be between 1.75% and 2.25%.

The long-term inflation assumption is 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 control inflation. This is a change from the previous valuation, in which the expected rate of inflation was 2.25% per annum.

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 impact of rebalancing and diversification)	5.15
Value added for active management (not exceeding the additional fees paid for active management [total investment management fees estimated at 0.30%] over passive management [passive management fees estimated at 0.10%])	0.20
Assumed margin for adverse deviation (originally set to achieve a high probability of exceeding the discount rate over the next 20 years)	(0.55)
Expected investment related expenses paid from the fund	(0.30)
Discount rate	4.50

The expected long-term nominal return by asset class is provided in Appendix C. The target asset mix used in the calculations is found in the Statement of Investment Policies adopted by the Trustees, as summarized in Table A.4. It should be noted that the return assumptions for bonds incorporate current market conditions while the return assumptions for equities and alternative investments are based more on long-term expectations.

Investment Expenses

The allowance for investment management expenses paid from the fund as built into the discount rate is 0.30% of assets based on recent Plan history and our expectation for future investment expenses.

Rate of Salary Increase

Salary increases consist of a combination of inflation, productivity growth (i.e. real increase in average employment earnings in excess of inflation) and merit and promotional increase.

The basic salary increase assumption is 2.60% per annum (based on assumed inflation of 2.10% per annum and productivity growth, merit and promotion of 0.5% per annum). This is a change from the basic salary increase assumption of 2.75% per annum used for in the previous valuation, consistent with the decrease in the long-term rate of inflation assumption. Based on prior studies, merit and promotion increases for this group does not provide for much movement to higher earnings levels over a career.

Mortality

We used the CPM-2014Publ Mortality Table, and the CPM-B Improvement Scale, which varies by gender, age and calendar year. Adjustment factors of 131.0% and 123.0% for males and females, respectively, were also applied to the mortality table to take into account the level of pensioner benefits among plan beneficiaries, as well as the expected mortality for employees in the medical and social services industry relative to the general public sector. The same adjustments were used for other participants before and after retirement. This is the same mortality assumption as used in the previous valuation.

The mortality rates described above result in the following life expectancies for females and males.

Table 1.8 - Life expectancy for Females and Males

Females					Life expectancy by Age in Year…
Age	2020	2025	2030	2035	2040
55	32.8	33.1	33.3	33.6	33.8
60	28.0	28.2	28.5	28.7	29.0
65	23.3	23.6	23.8	24.0	24.3
70	18.9	19.1	19.3	19.5	19.7
75	14.7	14.9	15.1	15.2	15.4
80	10.8	11.0	11.1	11.3	11.4
Males					**Life expectancy by Age in Year…**
Age	2020	2025	2030	2035	2040
55	30.2	30.5	30.7	31.0	31.3
60	25.6	25.8	26.1	26.4	26.6
65	21.1	21.4	21.6	21.8	22.1
70	16.8	17.0	17.2	17.4	17.7
75	12.7	12.9	13.1	13.3	13.5
80	9.0	9.2	9.4	9.5	9.7

Termination

The updated set of termination rates based on the recent analysis of the historical plan data from January 1, 2013 to December 31, 2017 was used. Both terminations resulting in payouts and suspended/deferred terminations were considered with the assumption that 25% of terminations will result in lump sum payouts, and the remaining 75% will lead to deferred pensions. The termination scale is a combined male and female applicable to both genders as shown in Table 1.6 and is the same assumption as the scale used in the previous valuation.

Rate of Increase in YMPE

We have continued to assume in this valuation that the YMPE will increase at the same rate as salary. As a result, we have used a rate of 2.60% per annum. The YMPE is automatically updated to its revised base level at each valuation date. This is a change from the YMPE increase assumption of 2.75% per annum used for in the previous valuation, consistent with the decrease in the long-term rate of inflation.

Retirement

Given the changing early retirement subsidies for service after the Conversion Date, we estimate that Plan members will slowly start to delay retirement as we move away from the Conversion Date. As a result, we adopted retirement assumptions that vary depending on the member's age at conversion, and an ultimate retirement assumption for new members after conversion. A younger member at the valuation date will be expected to retire later on average than an older worker at the same date. This assumption was adopted at the initial conversion to the shared risk plan and did not change for this valuation. We will continue to monitor this assumption for reasonableness.

Opinion on Funding Policy Valuation

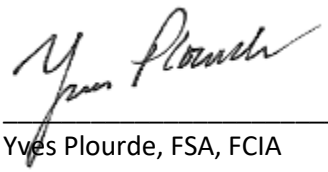
In our opinion, for the purposes of the funding policy valuation section of the report:

- The membership data on which the valuation is based is 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 report has been prepared, and our opinions given, in accordance with accepted actuarial practice in Canada.

The assumptions used under the funding policy valuation of this report were reasonable and consistent with the objectives of the 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

November 2, 2020

Date

Section 2 – Risk Management Goals and Procedures

Meeting Risk Management Goals

The 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 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 December 31, 2019.

Risk Management Goals

The primary risk management goal under the PBA 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 or future 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 (all members) that are in excess of 75% of CPI over the next 20 years.
- On average be expected to provide at least 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 December 31, 2019, the effective date of this report. The results of these tests combined with the results of the funding policy actuarial valuation at the same date will determine the actions the Board of Trustees is required to take, or can consider, under the terms of the Funding Policy.

The primary risk management goal must be achieved or exceeded:

- At July 1, 2012 (i.e. the Conversion Date), which it was based on the results found in the initial actuarial valuation report as at that 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; or
- At the date the contribution adjustments are fully implemented.

Notwithstanding the above, effective from January 1, 2018, where a benefit improvement relates to contingent indexing, such benefit improvement may be implemented provided there is at least a 95.0% probability that past base benefits will not be reduced over the following 20 years and provided the Board of Trustees confirms that the asset mix of the Plan has not been changed in a manner that increased investment risks in the six-month period before the contingent indexing occurred.

The secondary risk management goals must be achieved or exceeded:

- At July 1, 2012 (i.e. the Conversion Date), which it was based on the results found in the initial actuarial valuation report as at that date; or
- 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 Purpose of the Stochastic Analysis

Other assumptions are required for the stochastic analysis under the risk management procedures for the Plan. These additional assumptions are used to establish future Plan membership as well as future earnings, and to determine the level of future cash flows to and from the Plan, such as member and employer contributions, normal costs, benefit payments and expenses for the next 20 years. These cash flows are calculated on a deterministic basis for each year following the valuation date for a period of 20 years, and allow 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.

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

	December 31, 2019		
New entrants	Every termination, death, or retirement is replaced by a new entrant subject to a net decrease in active membership of 0.5% per year for 5 years, and stable active membership thereafter for the next 15 years. New entrants are assumed to be 75% female, 25% male.		
Distribution of new entrants and salary at entry:	Age	Distribution	Average Annualized Salary at Entry
	25	30%	$43,600 ($42,900 as of December 31, 2018)
	30	30%	$43,600 ($42,900 as of December 31, 2018)
	40	20%	$43,600 ($42,900 as of December 31, 2018)
	50	20%	$43,600 ($42,900 as of December 31, 2018)
Work Percentage	85%		
Inflation	2.10% per annum (2.25% per annum as of December 31, 2018)		
Salary increases	2.60% per annum (2.75% per annum as of December 31, 2018)		
YMPE increases	2.60% per annum (2.75% per annum as of December 31, 2018)		

Results of stochastic analysis as at December 31, 2019

The stochastic analysis undertaken as at December 31, 2019, took into account the main following items:

- Membership Data as at December 31, 2019 summarized in Appendix B;
- Economic and demographic assumptions as at December 31, 2019 for the funding policy valuation summarized in Section 1;
- Pension fund 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;
- CUPE SRP Plan provisions as summarized in Appendix D;
- Funding deficit recovery plan found under Section V of the CUPE SRP Plan's Funding Policy (except for reduction in past or future base benefits); and

- Funding excess utilization plan found under Section VI of the CUPE SRP Plan's Funding Policy (excluding permanent benefit changes).

Based on the above, the results of the stochastic analysis for the various risk management goals as at December 31, 2019 are as follows:

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

Risk Management Goal	Goal under PBA	Result for CUPE SRP Plan as at December 31, 2019
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	In order to provide "contingent indexing": **95.0%** In order to provide "other benefit changes": **97.5%**	**99.95**% **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; 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 (i.e. 2.0% per year)	We estimated that the combined impact of the Secondary Goal 1 for active members, retirees and deferred vested members represents an average indexing of 70.0% of the increase in the Consumer Price Index (CPI).	**94.2**% of the assumed increase in CPI **PASSED**
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 the value of ancillary benefits will be provided	Above **99.95%** of the value of ancillary benefits is expected to be provided (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 actions 2 and 3. This is the replacement of early retirement reductions for post-conversion service under action 2, and for pre-conversion service at action 3, by a full actuarial reduction for members not yet eligible to receive an immediate pension. In order to simplify the stochastic analysis and remain conservative, every time action is required beyond step 1 (increase in contributions), the model triggers a "benefit reduction scenario" for purpose of meeting the primary risk management goal. Therefore, it is expected that on average the Secondary Goal 2 above will exceed the primary risk management result of 99.95%, well above the minimum 75% level required under the PBA.

Section 3 – Hypothetical Wind-Up Valuation

A hypothetical wind-up valuation assumes that the 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 New Brunswick *Pension Benefits Act* 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 under the *Pension Benefits Act* 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 under the *Pension Benefits* Act prescribes that if a shared risk plan is wound-up by the persons who established the plan more than 5 years but less than 10 years after the conversion date, the plan conversion may be declared void at the discretion of the Superintendent. This may require the plan to be wound-up as a defined benefit plan under Part 1 of the PBA.

It is important to note that the former CUPE Plan was not subject to the PBA and the procedures to be followed if a wind-up occurred were not defined within the former CUPE Plan. As a result, the procedures for payments at wind-up were not defined. In conducting the hypothetical wind-up valuation as at December 31, 2019, we therefore made the assumption that the conversion to a shared risk plan would be void, and that the CUPE SRP plan would be wound-up as at December 31, 2019 in accordance with the rules found under Part 1 of the PBA. This assumption has been made solely on the basis that subsection 16(3.1) would apply on December 31, 2019, and does not represent a legal opinion on the validity of this scenario.

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 December 31, 2019 (adjusted to provide fixed indexing of 2.0% per annum).

Hypothetical Wind-Up Funded Status

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 CUPE SRP Plan while it is not in a wind-up state.

The hypothetical wind-up funded status under the scenario postulated above, including the results of the last hypothetical wind-up valuation, is presented in Table 3.1 below.

Table 3.1 – Hypothetical Wind-Up Funded Status

	December 31, 2019	December 31, 2018
	$	$
Assets		
• Market value of assets	$1,002,480,000	$896,707,000
• Provision for wind-up expenses	($1,500,000)	($1,500,000)
• Total	$1,000,980,000	$895,207,000
Hypothetical wind-up liabilities		
• Active members	$1,157,137,000	$1,021,572,000
• Terminated and suspended members	$130,155,000	$185,430,000
• Retired members and beneficiaries	$866,606,000	$795,827,000
• Outstanding refunds	$117,000	$1,135,000
• Total hypothetical wind-up liabilities	$2,154,015,000	$2,003,964,000
Assets less liabilities on the hypothetical wind-up basis	($1,153,035,000)	($1,108,757,000)

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 December 31, 2019 to December 31, 2020, adjusted for expected benefit payments in the inter-valuation period. This incremental cost is estimated to be $109,486,000 as at December 31, 2019.

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 Plan is wound up on the valuation date. This method is the same as the one used in the last valuation.

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. This method is the same as the one used in the last valuation.

Hypothetical Wind-Up Actuarial Assumptions

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

Although the Former CUPE Plan was not subject to the PBA before it was converted to the CUPE SRP Plan, in the absence of specific direction to the contrary in the Former CUPE Plan, we have valued the hypothetical wind-up

liability using discount rates consistent with the requirements of the PBA if the Plan were to be wound up. 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 December 31, 2019. Since the commuted value rates in accordance with the Canadian Institute of Actuaries' Standard of Practice Section 3500 – Pension Commuted Values, produced a higher liability for members not eligible to retire, these rates were used. We adjusted the above rates with the fixed rate of indexing of 2.0% per annum under the Former CUPE Plan in order to obtain a net rate for valuation.

The main 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 3.2 – Hypothetical Wind-Up Actuarial Assumptions

	December 31, 2019	December 31, 2018
Interest rate		
• Interest rate for active members and deferred vested members under 55	0.40% net per annum for 10 years, 0.50% net per annum thereafter	3.23% (1.21% net) per annum; or 3.2% (1.18% net) per annum for 10 years, 3.4% (1.37% net) per annum thereafter
• Interest rate for all other members	0.94% net per annum	3.23% (1.21% net) per annum
Salary increases	None	None
Mortality	CPM2014 Composite table projected with Scale CPM-B	CPM2014 Composite table projected with Scale CPM-B
Termination (membership)	None	None
Provision for wind-up expenses	$1,500,000	$1,500,000
Retirement	Age that maximizes the value of the pension	Age that maximizes the value of the pension

Allowance has been made for administrative, actuarial and legal costs which would be incurred if the 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, adjusted to account for a fixed rate of indexing of 2.0% per annum.

Choice of Assumptions

Discount Rate

The interest 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 December 2019.

The discount rate for non-indexed annuities is 2.96% per annum. This rate is based on the CIA recommendations [the long term Government of Canada bonds' yield (series V39062) for December 2019 of 1.76% plus an adjustment of 1.20% based on the liability duration of roughly 14 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 net rate after taking into account the escalation of pension of 2.0% per annum provided by the former CUPE Plan is therefore 0.94% per annum.

The discount rate used for active members and deferred vested members not eligible for immediate retirement is the rate suggested by the CIA as the commuted valued rate for deferred annuities indexed at 2.0% per annum.

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.
- CUPE SRP Plan conversion would be void and the pension plan would be wound-up under Part 1 of the PBA.
- Since commuted value rates are lower than annuity purchase rates, commuted values would be paid out to active and deferred vested members not eligible for immediate retirement.
- Indexed annuities at a fixed rate of 2.0% per annum would be purchased for all other plan members.

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 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 or bankruptcy.

Hypothetical Wind-Up Incremental Cost

The incremental cost on the hypothetical wind-up basis is based on the actuarial method and assumptions described below.

The method used to calculate the incremental cost may be described as follows:

1. Present value of expected benefit payments between December 31, 2019 and December 31, 2020, discounted to December 31, 2019;

   Plus

2. Projected hypothetical wind-up liabilities as at December 31, 2020, discounted to December 31, 2019;

   Less

3. Hypothetical wind-up liabilities as at December 31, 2019.

The projected liabilities as at December 31, 2020 take into account:

- accrual of service to December 31, 2020;
- expected changes in benefits to December 31, 2020; and
- projection of pensionable earnings to December 31, 2020.

The actuarial assumptions used to calculate the incremental cost may be described as follows:

- The assumptions used to calculate the expected benefit payments in item 1. above and service accruals, projected changes in benefits and projected changes in the pensionable earnings in item 2. above correspond to those used in the going-concern valuation as at December 31, 2019.
- The assumptions used to calculate the projected solvency liabilities as at December 31, 2020 in item 2. above correspond to those used for the solvency valuation as at December 31, 2019, taking into account the method of settlement applicable to each member as at December 31, 2019.

  However, we assume that the discount rates remain at the levels applicable as at December 31, 2019 and that the select period is reset as at December 31, 2020 for discount rate assumptions that are select and ultimate.

  We also assume that the standards of practice for the calculation of commuted values and the guidance for estimated annuity purchase costs in effect as at December 31, 2019 remain in effect as at December 31, 2020
- The rates used to discount items 1. and 2. above from December 31, 2019 to December 31, 2020 correspond to those used for the solvency valuation as at December 31, 2019. However, these rates are adjusted to take into account the applicable method of settlement applicable to each member as at December 31, 2020.

Note that no new entrants were considered between December 31, 2019 and December 31, 2020 as the impact on the incremental cost is not material.

Opinion on Hypothetical Wind-Up Valuation

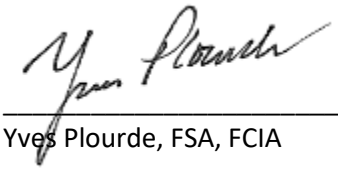
In our opinion, for the purposes of the hypothetical wind-up valuation section of the report:

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

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

Respectfully submitted,



Yves Plourde, FSA, FCIA

November 2, 2020
Date

Section 4 – 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 4.

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. Previously, the discount rate sensitivity results for the funding policy and hypothetical wind-up bases would have been found in Sections 1 and 3 of the actuarial valuation report, respectively. As these sensitivities are also a form of stress test, we have included them in this Section 4 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 1.0% immediately, leading to a 0.3% 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 4.20% 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 10.15% increase on the market value of the affected asset classes, which translates into a 5.6% 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 9.3% immediately, resulting in a 4.9% 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 multiplier of 0.7 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 4.1 – Plausible Adverse Scenarios Impact on the Funding Policy Valuation Results

	Funding Policy Valuation Results as at December 31, 2019	Plausible Adverse Scenario Results as at December 31, 2019			
		Scenario I Interest Rate Risk	Scenario II Deterioration of Asset Values	Scenario III Longevity Risk	Scenario IV Decrease in Contribution Base
	$	$	$	$	$
Market value of assets	1,002,480,000	1,058,619,000	953,358,000	1,002,480,000	1,002,480,000
Funding policy actuarial liabilities	1,065,997,000	1,108,845,000	1,065,997,000	1,134,011,000	1,065,997,000
Funding policy valuation excess (unfunded liability)	(63,517,000)	(50,226,000)	(112,639,000)	(131,531,000)	(63,517,000)
Termination value funded ratio	94.0%	95.5%	89.4%	88.4%	94.0%
Present value of excess contributions over the next 15 years	362,047,000	341,964,000	362,047,000	341,713,000	325,842,000
Open group funded ratio	128.0%	126.3%	123.4%	118.5%	124.6%
Funding policy valuation normal cost	35,936,000	38,241,000	35,936,000	37,765,000	32,342,000
Results of stochastic analysis for risk management goal					
Primary Goal [Regulation 7(1)]	99.95% PASS	99.95% PASS	99.95% PASS	99.40% PASS	99.85% PASS
Secondary Goal 1 [Regulation 7(3)(a)]	94.2% PASS	94.1% PASS	92.2% PASS	85.6% PASS	90.9% PASS
Secondary Goal 2 [Regulation 7(3)(b)]	At least 99.95% PASS	At least 99.95% PASS	At least 99.95% PASS	At least 99.40% PASS	At least 99.85% 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 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 4.2 – Sensitivity of Actuarial Liabilities on the Funding Policy Valuation Basis

	December 31, 2019	Discount rate 1% lower
	$	$
Actuarial liabilities		
• Active members	408,043,000	491,637,000
• Retirees and survivors	86,954,000	104,597,000
• Deferred vested and suspended members	570,883,000	625,688,000
• Outstanding refunds	117,000	117,000
• Total	1,065,997,000	1,222,039,000
Increase in actuarial liabilities		156,042,000

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 4.3 – Sensitivity of Funding Policy Valuation Total Normal Cost

	As at December 31, 2019		Discount Rate 1% lower	
	$	% of payroll	$	% of payroll
Total normal cost	35,936,000	10.6%	44,887,000	13.3%
Increase in total normal cost			8,951,000	2.7%

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

	December 31, 2019	Discount Rates 1% lower
	$	$
Actuarial liabilities		
• Active members	1,157,137,000	1,454,139,000
• Terminated and suspended members	130,155,000	157,168,000
• Retired members and beneficiaries	866,606,000	979,224,000
• Outstanding refunds	117,000	117,000
• Total	2,154,015,000	2,590,648,000
Increase in actuarial liabilities		436,633,000

Appendix A – Assets

Description of Plan Assets

The assets of the plan are held in a trust fund, and RBC Investor & Treasury Services is the custodian for the assets of the pension fund.

Statement of Market Value

The following table shows the asset mix as at December 31, 2019, and for comparison, the mix as at December 31, 2018 extracted from the Plan's prior actuarial valuation:

Table A.1 – Assets at Market Value

	December 31, 2019	December 31, 2018
Invested assets		
• Canadian Equities	$120,775,981	$77,317,516
• Foreign Equities	145,449,228	122,474,077
• Fixed Income	442,540,164	424,827,197
• Real Estate	145,715,249	130,294,653
• Infrastructure	121,562,287	110,202,326
• Derivatives	856,520	(509,007)
• Short Term	16,160,510	21,342,196
• Net amount receivable	9,420,418	10,757,980
Total assets	$1,002,480,357	$896,706,938

Changes to Plan Assets

The following table shows changes to the Plan assets held by RBC Investor & Treasury Services (the custodian) during the inter-valuation period, based on market values. The reconciliation from January 1, 2019 to December 31, 2019 is based on the audited financial statements issued by Grant Thornton for the full calendar year 2019.

Table A.2 – Reconciliation

	2019
Assets at beginning of year	$896,706,938
Receipts	
• Contributions and transfers	65,066,538
• Investment income plus realized and unrealized capital appreciation and depreciation	97,925,590
Total receipts	162,992,128
Disbursements	
• Pensions paid and refunds	52,383,411
• Expenses (fees)	4,835,298
Total disbursements	57,218,709
Assets at end of year	$1,002,480,357

Return on Assets

The CUPE SRP Plan assets earned the following rates of return, net of investment related expenses charged to the fund, based on our calculations which assume cash flow occurred in the middle of the period:

Table A.3 – Investment Return (net of investment related expenses)

Year	Rate of Return
2019	10.54%
2018	1.13%
2017	8.45%
2016	7.88%
2015	2.81%
2014	9.44%

Actuarial Value of Assets

We have used the market value of assets (including receivables / payables) without adjustment. The actuarial value of assets as at December 31, 2019 was $1,002,480,000.

Target Asset Mix under Shared Risk Plan

The statement of investment policy and goals for the CUPE SRP Plan provides for the long term target asset mix shown in the table below. The target asset mix below includes recent changes approved by the Board of Trustees and reflected in the SIP&G dated September 2019:

Table A.4 – Target Asset Mix

	Target
Asset classes	
• Fixed Income – Domestic Treasury Bills (DTB)	0.5%
• Fixed Income – Domestic Universe Bonds (DUB)	9.0%
• Fixed Income – Domestic Long-term Bonds (DLB)	25.5%
• Fixed Income – US High Yield Bonds (USHY)	5.0%
• Fixed Income – Global Government Bonds (GGB)	5.0%
• Private Debt (PD)	5.0%
• Canadian Equities (DE)	10.0%
• Foreign Equities (FE)	15.0%
• Canadian Real Estate (CRE)	10.0%
• Global Real Estate (GRE)	5.0%
• Infrastructure (I)	10.0%
Total	100.0%

This target asset mix was used to determine the real rate of return assumption under the plan, 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

The data as at December 31, 2019 was extracted from Morneau Shepell's Ariel administration system and reviewed by Vestcor.

The data was matched and reconciled with the data provided for the previous valuation as at December 31, 2018. Basic data checks were performed to ensure that age, salary, service and accrued pensions data were reasonable for the purposes of the valuation and to ensure that the data was accurate, complete and consistent with previous data.

In very limited cases where the credibility of the data received this year for certain individuals was questioned in light of a comparison with the data received as part of the previous valuation, the data from the previous valuation was used.

Summary of Membership Data

The following tables were prepared using data provided by Vestcor regarding its active members, retirees and former members. Accrued pensions, in payment or not, for all members reflect all cost-of-living and benefit improvement adjustments granted by the Board of Trustees effective January 1, 2020.

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 December 31, 2019
- B.4 Distribution of Retired Members and Beneficiaries by Age Groups as at December 31, 2019
- B.5 Distribution of Terminated and Suspended Members by Age Groups as at December 31, 2019

Table B.1 - Summary of Membership Data

	December 31, 2019	December 31, 2018
Active members[1]		
• Number	8,136	8,091
• Total covered payroll[2]	$340,000,000	$339,800,000
• Average salary	$41,800	$42,000
• Average age	44.3 years	44.5 years
• Average accrued lifetime pension	$5,490	$5,368
• Average accrued bridge benefit	$2,098	$2,046
• Average credited service	8.7 years	8.6 years
Terminated and suspended members		
• Number	2,812	2,425
• Average annual lifetime pension	$3,345	$3,325
• Average annual bridge benefit[3]	$1,425	$1,285
• Average age	44.5 years	44.9 years
Retired members and beneficiaries		
• Number	4,279	4,079
• Average annual lifetime pension	$10,518	$10,323
• Average annual bridge benefit[3]	$4,954	$4,923
• Average age	70.2 years	70.0 years

[1] Includes all actively contributing members at the valuation date. Any non-contributing members, such as on a leave of absence, members who have signed an intra-provincial agreement, or suspended, are grouped under Terminated and Suspended members.

[2] Estimated total payroll for actively contributing employees, taking into account work percentage by individual for part-time employees.

[3] Average for those entitled to or receiving a bridging benefit.

There were also 6 other inactive members with outstanding payments as at December 31, 2019, for a total amount owed of $117,000.

Table B.2 – Changes in Plan Membership

	Active Members	Terminated and Suspended members	Retired Members and Beneficiaries	Total
Members at December 31, 2018	8,091	2,425	4,079	14,595
New members	824	-	-	824
Returned to active status	422	(422)	-	-
Retirements	(191)	(84)	275	-
Terminations:				
• Paid out	(67)	(40)	-	(107)
• Outstanding refunds owing	(5)	(1)	-	(6)
• Reclassified as suspended	(792)	792	-	-
• Transfer to nursing homes	(147)	147	-	-
Deaths:				
• with no continuing benefits	(1)	(5)	(79)	(85)
• with survivors	-	(1)	(17)	(18)
New survivor pensions	-	-	20	20
Guarantee period expired	-	-	(1)	(1)
Data Adjustments	2	1	2	5
Members at December 31, 2019	8,136	2,812	4,279	15,227

Table B.3 – Age/Service Distribution for Active Members as at December 31, 2019

Years of Service		Under 24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60 and Over	Total
0 - 4	Num.	434	677	432	330	317	262	251	199	101	3,003
	Avg. Sal.	$39,401	$40,410	$38,063	$37,277	$37,940	$36,636	$34,755	$34,117	$32,062	$37,822
	Avg. Pen.	$716	$1,264	$1,541	$1,534	$1,598	$1,556	$1,684	$1,595	$1,622	$1,384
5 - 9	Num.		115	342	354	389	359	330	294	164	2,347
	Avg. Sal.		$45,792	$45,328	$43,495	$43,418	$41,935	$41,283	$40,691	$38,465	$42,610
	Avg. Pen.		$4,063	$4,551	$4,693	$4,642	$4,505	$4,406	$4,411	$4,330	$4,503
10 - 14	Num.			65	203	289	266	258	251	137	1,469
	Avg. Sal.			$48,724	$47,442	$46,533	$46,203	$45,067	$44,386	$43,526	$45,791
	Avg. Pen.			$7,405	$7,724	$7,724	$7,808	$7,752	$7,702	$7,611	$7,716
15 - 19	Num.				31	80	136	157	175	119	698
	Avg. Sal.				$44,946	$46,907	$46,016	$44,551	$44,525	$42,391	$44,749
	Avg. Pen.				$9,920	$10,784	$10,819	$10,825	$10,669	$10,625	$10,706
20 - 24	Num.					4	35	47	82	43	211
	Avg. Sal.					$48,037	$47,977	$45,711	$43,600	$43,887	$44,939
	Avg. Pen.					$13,345	$14,509	$13,890	$13,652	$13,653	$13,841
25 - 29	Num.						5	90	93	26	214
	Avg. Sal.						$48,474	$45,174	$45,328	$44,838	$45,277
	Avg. Pen.						$18,147	$18,064	$18,096	$18,231	$18,100
30 and over	Num.							21	125	48	194
	Avg. Sal.							$44,900	$45,353	$45,039	$45,226
	Avg. Pen.							$20,676	$21,971	$24,245	$22,393
Total number		**434**	**792**	**839**	**918**	**1,079**	**1,063**	**1,154**	**1,219**	**638**	**8,136**
Average of salaries		**$39,401**	**$41,192**	**$41,850**	**$42,182**	**$42,919**	**$42,449**	**$41,704**	**$41,956**	**$40,390**	**$41,793**
Average of accrued lifetime pension		**$716**	**$1,670**	**$3,222**	**$4,404**	**$5,061**	**$5,806**	**$7,183**	**$8,994**	**$8,473**	**$5,490**

Average age: 44.3 years

Average number of years of service: 8.7 years

Notes:

Age groups are based on exact age.

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

The salary used is the estimated salary rate as of January 1, 2020.

Membership for active members is composed of 2,051 males and 6,085 females.

Table B.4 – Distribution of Retired Members and Beneficiaries by Age Groups as at December 31, 2019

Age Group	Number	Total Annual Payments	
		Lifetime	Bridge
Under 60	305	3,028,550	1,411,992
60-64	930	10,790,962	4,542,295
65-69	1148	12,277,193	-
70-74	826	9,034,574	-
75-79	520	5,331,400	-
80-84	300	2,740,155	-
85-89	156	1,173,523	-
90 and over	94	628,174	-
Total	**4,279**	**45,004,532**	**5,954,287**

Average age: 70.2

Notes:

Age groups are based on exact age.

The pension used is the pension payable as at January 1, 2020

Membership for retired members and beneficiaries is composed of 962 males and 3,317 females.

Note that as part of the pension payments described above, there are payments continuing to be made to 46 beneficiaries under remaining guarantees after pensioners' deaths for a total of $378,153 annually.

Table B.5 – Distribution of Terminated and Suspended Members by Age Groups as at December 31, 2019

Age Group	Number	Total Accrued Pensions	
		Lifetime	Bridge
Under 25	83	50,587	24,469
25 - 29	285	360,066	165,907
30 - 34	389	802,074	344,116
35 - 39	360	1,020,129	441,185
40 - 44	333	1,041,414	453,457
45 - 49	359	1,287,031	562,407
50 - 54	368	1,711,415	724,718
55 - 59	364	1,806,554	738,441
60 and over	271	1,327,584	553,743
Total	**2,812**	**9,406,853**	**4,008,443**

Average age: 44.5 years

Notes:

Age groups are based on exact age.

The pension used is the pension payable as at January 1, 2020.

Membership for terminated and suspended members is composed of 693 males and 2,119 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 Morneau Shepell Asset 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	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029 and after
Market implied inflation (%)	1.35	1.44	1.53	1.62	1.71	1.80	1.90	1.99	2.08	2.17	2.26

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 December 31, 2019.

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	1.80%	3.17%
FTSE Canada Federal Short Term Bonds	n/a	n/a	1.77%	2.81%
FTSE Canada Federal Mid Term Bonds	n/a	n/a	1.85%	3.40%
FTSE Canada Federal Long Term Bonds	n/a	n/a	1.82%	3.90%
FTSE Canada Corporate Bonds	1.01%	1.14%	2.80%	4.31%
FTSE Canada Short Term Corporate Bonds	0.64%	0.83%	2.41%	3.64%
FTSE Canada Mid Term Corporate Bonds	1.14%	1.22%	2.99%	4.62%
FTSE Canada Long Term Corporate Bonds	1.57%	1.62%	3.39%	5.53%
FTSE Canada Universe Provincial Bonds	0.54%	0.86%	2.33%	4.02%
FTSE Canada Short Term Provincial Bonds	0.16%	0.23%	1.92%	3.04%
FTSE Canada Mid Term Provincial Bonds	0.38%	0.48%	2.24%	3.87%
FTSE Canada Long Term Bonds	0.72%	0.74%	2.54%	4.64%

** 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, private debt, 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 December 31, 2019. For reference, we have also included the return and volatility as at the date of the previous valuation, December 31, 2018.

Table C.3 – Expected Long-Term Return and Volatility (Standard Deviation) by Asset Class

	December 31, 2019		December 31, 2018	
	Expected Annualized Long-Term Return	Volatility of Annual Return	Expected Annualized Long-Term Return	Volatility of Annual Return
Inflation (change in consumer price index)	2.10%	1.30%	2.25%	1.3%
Asset classes				
Fixed Income				
• Short term assets (DTB)	2.10%	1.1%	2.20%	1.2%
• Domestic Universe Bonds (DUB)	2.95%	5.9%	3.25%	6.8%
• Domestic Long-Term Bonds (DLB)	3.00%	9.4%	3.50%	10.4%
• US High Yield Bonds (USHY)	5.35%	12.0%	6.20%	11.8%
• Global Government Bonds (GAC/JPG)*	2.30%	6.2%	2.58%	5.7%
Equities				
• Canadian Equities (DE)	6.80%	16.4%	7.25%	16.3%
• Foreign Equities (FE)	6.50%	15.2%	6.90%	14.9%
Alternative Investments				
• Canadian Real Estate (CRE)	6.05%	9.0%	6.25%	9.9%
• Infrastructure (I)	6.30%	13.0%	6.85%	13.0%
• Private Debt (CPD/CM)**	4.68%	3.6%	N/A	N/A
• Global Real Estate (GRE)	5.75%	9.2%	6.30%	12.8%

** Two asset classes were used as a proxy for Global Government Bonds: Global Aggregate Credit (GAC) and Non-US Government Bonds (JPG)*

*** Two asset classes were used as a proxy for Private Debt: Canadian Corporate Private Debt (CPD) and Canadian Mortgages (CM)*

The following is the correlation among the various asset classes identified in Table C.3 used as at December 31, 2019. 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 asset returns:

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

	DTB	DUB	DLB	USHY	GAC	JPG	DE	FE	CRE	I	CPD	CM	GRE
DTB	1.00	0.59	0.05	-0.22	0.08	0.34	0.24	0.24	0.51	0.02	0.45	0.75	0.55
DUB		1.00	0.69	0.00	0.20	0.73	0.20	0.23	0.29	0.16	0.93	0.84	0.33
DLB			1.00	0.38	0.37	0.66	-0.05	0.02	-0.13	0.20	0.72	0.43	-0.12
USHY				1.00	0.65	-0.12	-0.61	-0.54	-0.28	0.00	0.23	0.02	-0.37
GAC					1.00	0.09	-0.38	-0.27	0.10	0.14	0.37	0.31	-0.01
JPG						1.00	0.37	0.35	0.21	0.08	0.58	0.51	0.23
DE							1.00	0.53	0.23	0.08	-0.01	0.12	0.35
FE								1.00	0.17	-0.08	0.06	0.08	0.38
CRE									1.00	0.11	0.16	0.39	0.82
I										1.00	0.19	0.11	0.07
CPD											1.00	0.80	0.15
CM												1.00	0.37
GRE													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.

For purposes of this report, The Plan's contributing member population is assumed to reduce by 0.5% per year for a period of five years following December 31, 2019, and remain stable thereafter in each subsequent year of the projection period. This is to reflect the impact of remaining former FacilicorpNB employees whose replacements upon termination would be members of the Public Service Pension Plan as a result of Service New Brunswick's restructuring. As such, departures from the Plan, for any reason, are assumed to be replaced by the number of new entrants such that the overall contributing member population reduces by 0.5% per year for a period of five years following December 31, 2019, and remains stable thereafter in each subsequent year of the projection period.

The following table contains the results of the deterministic projection, in particular the number of active 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.

Table C.5 – Projection Statistics for Active Members

Date	Number of Active Members	Average Age (years)	Average Pensionable Service (years)	Average Salary ($) *
31-Dec-20	8,136	45.1	9.2	42,099
31-Dec-21	8,095	44.5	9.2	42,820
31-Dec-22	8,055	44.3	9.3	43,614
31-Dec-23	8,015	44.3	9.4	44,440
31-Dec-24	7,974	44.3	9.5	45,311
31-Dec-25	7,935	44.3	9.6	46,436
31-Dec-26	7,935	44.3	9.8	47,362
31-Dec-27	7,935	44.4	9.9	48,343
31-Dec-28	7,935	44.5	10.1	49,382
31-Dec-29	7,935	44.7	10.3	50,445
31-Dec-30	7,935	44.7	10.4	51,537
31-Dec-31	7,935	44.8	10.5	52,677
31-Dec-32	7,935	44.9	10.7	53,847
31-Dec-33	7,935	45.1	10.8	55,072
31-Dec-34	7,935	45.2	10.9	56,324
31-Dec-35	7,935	45.1	11.0	57,601
31-Dec-36	7,935	45.1	11.0	58,912
31-Dec-37	7,935	45.1	11.1	60,273
31-Dec-38	7,935	45.1	11.1	61,681
31-Dec-39	7,935	45.2	11.2	63,137

** 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 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 ($)
31-Dec-20	7,355	53,935,000
31-Dec-21	8,058	58,869,000
31-Dec-22	8,652	61,984,000
31-Dec-23	9,203	64,254,000
31-Dec-24	9,752	66,380,000
31-Dec-25	10,273	68,636,000
31-Dec-26	10,776	70,125,000
31-Dec-27	11,264	71,469,000
31-Dec-28	11,730	72,499,000
31-Dec-29	12,192	73,337,000
31-Dec-30	12,667	74,421,000
31-Dec-31	13,133	75,530,000
31-Dec-32	13,584	76,582,000
31-Dec-33	14,027	77,701,000
31-Dec-34	14,466	78,786,000
31-Dec-35	14,931	80,187,000
31-Dec-36	15,401	81,669,000
31-Dec-37	15,862	83,103,000
31-Dec-38	16,301	84,335,000
31-Dec-39	16,726	85,491,000

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 ($)	Active Liability ($)	Inactive Liability ($)
31-Dec-20	1,093,712,000	452,428,000	641,284,000
31-Dec-21	1,117,160,000	431,845,000	685,315,000
31-Dec-22	1,138,539,000	421,828,000	716,711,000
31-Dec-23	1,158,896,000	419,643,000	739,253,000
31-Dec-24	1,178,346,000	417,239,000	761,107,000
31-Dec-25	1,196,811,000	416,417,000	780,394,000
31-Dec-26	1,215,277,000	419,223,000	796,054,000
31-Dec-27	1,233,961,000	423,658,000	810,303,000
31-Dec-28	1,253,343,000	431,456,000	821,887,000
31-Dec-29	1,273,748,000	443,072,000	830,676,000
31-Dec-30	1,294,903,000	453,890,000	841,013,000
31-Dec-31	1,316,857,000	464,794,000	852,063,000
31-Dec-32	1,339,814,000	477,898,000	861,916,000
31-Dec-33	1,363,785,000	492,081,000	871,704,000
31-Dec-34	1,388,878,000	507,763,000	881,115,000
31-Dec-35	1,414,620,000	519,273,000	895,347,000
31-Dec-36	1,440,883,000	528,080,000	912,803,000
31-Dec-37	1,467,827,000	537,577,000	930,250,000
31-Dec-38	1,495,848,000	550,503,000	945,345,000
31-Dec-39	1,525,147,000	565,284,000	959,863,000

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 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 with the exception of reductions in past or future base benefits and excluding permanent benefit changes. When modeling the funding deficit recovery plan actions over the 20-year period of each of the 10,000 economic scenarios, each of the five 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 “benefit reduction trial” is recorded (for purposes of the primary risk management goal calculation) when step 5 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. For conservatism, our stochastic model also recorded a "benefit reduction trial" (for purposes of the primary risk management goal calculation) when any action beyond step 1 was required. The primary risk management measure is therefore the proportion of those 10,000 scenarios that do not lead to a base benefit reduction 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 "benefit reduction trial" 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	5.0% load added to normal cost

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
2020	-7.45%	-6.25%	-4.41%	0.30%	3.84%	7.36%	12.57%	3.91%	5.13%
2021	-8.14%	-6.71%	-4.51%	0.44%	4.02%	7.70%	13.07%	4.11%	5.36%
2022	-8.29%	-6.88%	-4.69%	0.41%	4.06%	7.68%	13.18%	4.12%	5.42%
2023	-7.96%	-6.55%	-4.35%	0.79%	4.41%	8.02%	13.37%	4.42%	5.37%
2024	-7.87%	-6.49%	-4.37%	0.65%	4.23%	7.92%	13.26%	4.31%	5.35%
2025	-7.69%	-6.23%	-4.05%	0.94%	4.52%	8.14%	13.34%	4.56%	5.32%
2026	-7.67%	-6.22%	-4.02%	0.93%	4.47%	8.09%	13.42%	4.55%	5.29%
2027	-7.28%	-5.95%	-3.86%	1.23%	4.76%	8.25%	13.58%	4.75%	5.25%
2028	-7.23%	-5.85%	-3.71%	1.28%	4.81%	8.35%	13.51%	4.84%	5.25%
2029	-7.16%	-5.73%	-3.59%	1.22%	4.74%	8.31%	13.41%	4.80%	5.22%
2030	-5.93%	-4.62%	-2.66%	2.35%	5.87%	9.41%	14.54%	5.90%	5.22%
2031	-6.17%	-4.79%	-2.69%	2.52%	5.97%	9.49%	14.62%	5.97%	5.22%
2032	-6.09%	-4.71%	-2.63%	2.29%	5.86%	9.41%	14.68%	5.88%	5.23%
2033	-6.37%	-4.90%	-2.64%	2.37%	5.90%	9.39%	14.69%	5.92%	5.26%
2034	-5.95%	-4.55%	-2.50%	2.50%	5.93%	9.46%	14.66%	6.00%	5.17%
2035	-5.94%	-4.65%	-2.64%	2.38%	5.87%	9.33%	14.50%	5.90%	5.19%
2036	-6.18%	-4.77%	-2.56%	2.41%	5.81%	9.40%	14.51%	5.89%	5.21%
2037	-5.95%	-4.58%	-2.60%	2.34%	5.86%	9.46%	14.71%	5.94%	5.24%
2038	-6.05%	-4.71%	-2.62%	2.40%	5.82%	9.42%	14.52%	5.92%	5.21%
2039	-6.26%	-4.80%	-2.56%	2.46%	5.83%	9.46%	14.66%	5.94%	5.22%
Annualized average over 20 years	2.75%	3.05%	3.48%	4.40%	5.05%	5.71%	6.64%	5.05%	0.97%

The stochastic model projects a distribution of the total funding policy valuation liabilities and assets 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 ($ millions)

Date	2.5% CTE*	5% CTE*	5th Percentile	25th Percentile	50th Percentile	75th Percentile	95th Percentile	Mean	Standard Deviation
31-Dec-20	1,097	1,099	1,102	1,114	1,122	1,130	1,136	1,121	11
31-Dec-21	1,128	1,132	1,138	1,158	1,173	1,185	1,199	1,171	19
31-Dec-22	1,159	1,165	1,174	1,202	1,221	1,237	1,259	1,219	25
31-Dec-23	1,191	1,198	1,211	1,245	1,267	1,288	1,315	1,266	32
31-Dec-24	1,223	1,232	1,248	1,286	1,312	1,337	1,372	1,311	38
31-Dec-25	1,256	1,266	1,284	1,327	1,356	1,385	1,427	1,355	43
31-Dec-26	1,289	1,301	1,320	1,367	1,399	1,432	1,481	1,400	49
31-Dec-27	1,322	1,335	1,356	1,407	1,442	1,480	1,535	1,444	54
31-Dec-28	1,355	1,369	1,391	1,448	1,488	1,528	1,589	1,489	60
31-Dec-29	1,389	1,404	1,428	1,490	1,534	1,580	1,646	1,535	66
31-Dec-30	1,424	1,440	1,467	1,532	1,582	1,631	1,703	1,583	72
31-Dec-31	1,459	1,477	1,505	1,579	1,631	1,685	1,765	1,633	79
31-Dec-32	1,495	1,515	1,546	1,627	1,683	1,743	1,828	1,685	85
31-Dec-33	1,533	1,555	1,589	1,677	1,738	1,801	1,893	1,739	92
31-Dec-34	1,573	1,597	1,634	1,729	1,794	1,862	1,962	1,796	99
31-Dec-35	1,615	1,641	1,680	1,782	1,853	1,923	2,031	1,854	106
31-Dec-36	1,658	1,686	1,731	1,838	1,912	1,988	2,101	1,913	113
31-Dec-37	1,701	1,732	1,780	1,893	1,972	2,053	2,173	1,974	120
31-Dec-38	1,748	1,781	1,832	1,951	2,034	2,119	2,249	2,036	126
31-Dec-39	1,796	1,832	1,886	2,011	2,097	2,189	2,324	2,101	133

**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 ($ millions)

Date	2.5% CTE	5% CTE	5th Percentile	25th Percentile	50th Percentile	75th Percentile	95th Percentile	Mean	Standard Deviation
31-Dec-20	935	947	966	1,013	1,049	1,084	1,137	1,049	52
31-Dec-21	941	957	982	1,046	1,093	1,141	1,212	1,094	70
31-Dec-22	946	968	1,000	1,077	1,134	1,193	1,282	1,136	86
31-Dec-23	961	984	1,022	1,111	1,178	1,246	1,355	1,181	101
31-Dec-24	978	1,003	1,042	1,143	1,218	1,297	1,417	1,223	115
31-Dec-25	990	1,019	1,065	1,176	1,260	1,350	1,494	1,267	130
31-Dec-26	1,002	1,034	1,083	1,209	1,302	1,402	1,562	1,310	146
31-Dec-27	1,021	1,056	1,111	1,244	1,348	1,459	1,633	1,357	160
31-Dec-28	1,043	1,078	1,131	1,284	1,394	1,516	1,711	1,405	176
31-Dec-29	1,067	1,104	1,162	1,319	1,442	1,574	1,792	1,454	192
31-Dec-30	1,096	1,139	1,205	1,372	1,505	1,651	1,896	1,520	211
31-Dec-31	1,133	1,177	1,245	1,426	1,569	1,728	2,001	1,588	231
31-Dec-32	1,168	1,214	1,288	1,480	1,638	1,810	2,103	1,658	250
31-Dec-33	1,206	1,254	1,330	1,543	1,707	1,899	2,207	1,731	269
31-Dec-34	1,245	1,297	1,376	1,604	1,783	1,989	2,324	1,808	290
31-Dec-35	1,282	1,340	1,429	1,660	1,855	2,075	2,445	1,885	313
31-Dec-36	1,323	1,381	1,473	1,725	1,929	2,170	2,570	1,965	337
31-Dec-37	1,369	1,434	1,536	1,788	2,007	2,261	2,705	2,047	359
31-Dec-38	1,413	1,482	1,591	1,853	2,086	2,364	2,830	2,131	384
31-Dec-39	1,458	1,530	1,640	1,922	2,169	2,471	2,964	2,220	413

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
31-Dec-20	116%	117%	119%	123%	126%	130%	134%	127%	5%
31-Dec-21	112%	114%	116%	121%	125%	130%	136%	126%	6%
31-Dec-22	109%	111%	114%	120%	124%	129%	137%	125%	7%
31-Dec-23	108%	110%	112%	119%	124%	129%	138%	124%	8%
31-Dec-24	107%	108%	111%	118%	123%	129%	139%	124%	9%
31-Dec-25	106%	107%	110%	117%	122%	129%	141%	123%	9%
31-Dec-26	105%	107%	109%	116%	122%	129%	142%	123%	10%
31-Dec-27	105%	106%	109%	116%	122%	129%	143%	123%	10%
31-Dec-28	104%	106%	109%	116%	122%	129%	144%	123%	11%
31-Dec-29	104%	106%	109%	115%	121%	129%	146%	123%	11%
31-Dec-30	104%	106%	109%	116%	122%	131%	148%	125%	12%
31-Dec-31	105%	107%	110%	117%	123%	132%	151%	126%	13%
31-Dec-32	106%	107%	110%	117%	124%	133%	153%	127%	13%
31-Dec-33	106%	108%	110%	118%	125%	134%	154%	127%	14%
31-Dec-34	106%	108%	111%	119%	125%	135%	156%	128%	14%
31-Dec-35	106%	108%	111%	119%	126%	136%	159%	129%	15%
31-Dec-36	107%	108%	111%	119%	126%	137%	161%	130%	16%
31-Dec-37	107%	109%	112%	119%	127%	139%	163%	131%	16%
31-Dec-38	107%	109%	112%	120%	127%	140%	165%	132%	17%
31-Dec-39	107%	109%	112%	120%	128%	142%	168%	133%	18%

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
31-Dec-20	82%	88%	97%	117%	123%	134%	192%	130%	34%
31-Dec-21	76%	82%	90%	115%	122%	133%	174%	126%	30%
31-Dec-22	70%	75%	84%	110%	121%	130%	163%	122%	27%
31-Dec-23	64%	70%	80%	106%	120%	128%	154%	118%	25%
31-Dec-24	60%	66%	76%	103%	118%	127%	148%	116%	24%
31-Dec-25	56%	62%	72%	100%	117%	125%	145%	113%	24%
31-Dec-26	52%	58%	69%	97%	116%	124%	141%	111%	23%
31-Dec-27	49%	56%	66%	95%	115%	123%	138%	109%	23%
31-Dec-28	47%	53%	63%	93%	114%	123%	136%	108%	24%
31-Dec-29	45%	51%	62%	92%	113%	122%	135%	106%	24%
31-Dec-30	43%	50%	61%	90%	113%	122%	133%	105%	23%
31-Dec-31	43%	50%	60%	90%	113%	121%	132%	105%	23%
31-Dec-32	43%	49%	60%	90%	113%	121%	131%	105%	23%
31-Dec-33	43%	50%	60%	91%	114%	121%	131%	105%	23%
31-Dec-34	43%	50%	61%	92%	114%	121%	130%	106%	22%
31-Dec-35	44%	51%	62%	93%	115%	121%	130%	106%	22%
31-Dec-36	45%	52%	64%	94%	115%	121%	130%	107%	22%
31-Dec-37	46%	54%	65%	95%	115%	121%	129%	107%	21%
31-Dec-38	48%	55%	66%	96%	115%	121%	129%	107%	20%
31-Dec-39	49%	56%	67%	97%	116%	121%	129%	108%	20%

**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	DTB	DUB	DLB	USHY	GAC	JPG	DE	FE	CRE	I	CPD	CM	GRE
DTB	1.00	0.37	0.00	-0.19	0.04	0.20	0.00	0.00	0.00	0.00	0.29	0.57	0.00
DUB		1.00	0.56	-0.23	0.11	0.65	-0.21	-0.24	-0.30	-0.17	0.91	0.82	-0.35
DLB			1.00	0.19	0.29	0.53	0.06	-0.02	0.16	-0.25	0.61	0.33	0.15
USHY				1.00	0.63	-0.36	0.48	0.42	0.22	-0.01	0.06	-0.09	0.29
GAC					1.00	-0.02	0.36	0.25	-0.10	-0.14	0.30	0.26	0.01
JPG						1.00	-0.39	-0.36	-0.23	-0.09	0.46	0.44	-0.25
DE							1.00	0.53	0.23	0.08	0.01	-0.10	0.35
FE								1.00	0.17	-0.08	-0.07	-0.06	0.38
CRE									1.00	0.11	-0.17	-0.31	0.82
I										1.00	-0.20	-0.09	0.07
CPD											1.00	0.78	-0.16
CM												1.00	-0.29
GRE													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 analysis 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 CUPE SRP Plan effective December 31, 2019. For an authoritative statement of the precise provisions of the CUPE SRP Plan, reference must be made to the official CUPE SRP Plan documents.

Introduction

The Pension Plan for CUPE Employees of New Brunswick Hospitals ("Former CUPE Plan") became effective on January 1, 1975. The Former CUPE Plan was amended at various times throughout its history.

Effective July 1, 2012, the Former CUPE Plan was converted to the CUPE SRP Plan. The administration of the CUPE SRP Plan continues to be the responsibility of an independent Board of Trustees.

Eligibility and Participation

Each Member of the Former CUPE Plan joins the CUPE SRP Plan on July 1, 2012. Active members of the Pension Plan for Part-Time and Seasonal Employees of the Province of New Brunswick who are eligible to join the CUPE SRP Plan ceased active membership in the said plan and were required to join the CUPE SRP Plan as of July 1, 2012.

Each employee who commences full-time employment on or after July 1, 2012 is required to join the Plan from the first day of the month coincident with or next following the date of employment.

Required Contributions

Effective July 1, 2012, each member is required to contribute 9.0% of earnings. Participating employers contribute at least 10.1% of earnings from the same date.

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

Normal Retirement

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

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

(A) In respect of service before January 1, 1997, the product of:

i. the number of years of the member's pensionable service before January 1, 1997, and

ii. 1.75% of the annual average of the best five (5) consecutive years of earnings at July 1, 2012, up to the annual average YMPE for the same five (5) years, plus 2% of the excess of the annual average of the best five (5) consecutive years of earnings at July 1, 2012 over the annual average YMPE for the same five (5) years;

and

(B) In respect of service from January 1, 1997 to July 1, 2012, the product of:

i. the number of years of the member's pensionable service during that period, and

ii. 1.4% of the annual average of the best five (5) consecutive years of earnings at July 1, 2012, up to the annual average YMPE for the same five (5) years, plus 2% of the excess of the annual average of the best five (5) consecutive years of earnings at July 1, 2012 over the annual average YMPE for the same five (5) years;

and

(C) In respect of service from July 1, 2012, the sum of (i) and (ii) for each calendar year (or portion thereof):

i. 1.4% of the Member's annualized earnings for the calendar year, up to the YMPE for the calendar year; and

ii. 2.0% of the portion of the Member's annualized earnings for the calendar year that are in excess of the YMPE for the calendar year.

Pensions accrued above are subject to cost-of-living adjustments, before and after retirement, every January 1st following July 1, 2012, subject to approval by the Board of Trustees, and in accordance with the trigger requirements found under the Funding Policy for the CUPE SRP Plan. The following cost-of-living adjustments have been granted by the Board of Trustees based on the results of the actuarial valuation preceding the effective date of the adjustments and the terms of the Funding Policy.

Table D.1 – Cost of Living Adjustments

Effective Date	Cost of Living Adjustment
January 1, 2013	2.00% (pro-rated by 50% for active members)
January 1, 2014	0.96% for current year, plus 0.4% for prior year
January 1, 2015	1.43%
January 1, 2016	1.49%
January 1, 2017	1.40%
January 1, 2018	1.47%
January 1, 2019	1.88%
January 1, 2020	2.12%

Further increases to accrued pensions for active members may be awarded under the terms of the Funding Policy once cost-of-living adjustments have been awarded and the results of the actuarial valuation preceding the effective date of the adjustments allow the Board of Trustees to spend additional funds on pension increases.

The following increases have been granted by the Board of Trustees based on the results of the actuarial valuation preceding the effective date of the adjustments and the terms found under "Other Actions", Step 2, of the Funding Excess Utilization Plan of the Funding Policy.

Table D.2 – Step 2 Pension Adjustments

Effective Date	Step 2 Pension Increase (active members only)
January 1, 2013	n/a
January 1, 2014	n/a
January 1, 2015	95% of additional increase necessary to provide all active members a lifetime benefit calculated using a 5-year final average benefit formula at December 31, 2013
January 1, 2016	100% of additional increase necessary to provide all active members a lifetime benefit calculated using a 5-year final average benefit formula at December 31, 2014
January 1, 2017	100% of additional increase necessary to provide all active members a lifetime benefit calculated using a 5-year final average benefit formula at December 31, 2015
January 1, 2018	100% of additional increase necessary to provide all active members a lifetime benefit calculated using a 5-year final average benefit formula at December 31, 2016
January 1, 2019	100% of additional increase necessary to provide all active members a lifetime benefit calculated using a 5-year final average benefit formula at December 31, 2017
January 1, 2020	100% of additional increase necessary to provide all active members a lifetime benefit calculated using a 5-year final average benefit formula at December 31, 2018

The following increases have been granted by the Board of Trustees based on the results of the actuarial valuation preceding the effective date of the adjustments and the terms found under "Other Actions", Step 3, of the Funding Excess Utilization Plan of the Funding Policy.

Table D.3 – Step 3 Pension Adjustments

Effective Date	Step 3 Pension Increase (pensioners only)
January 1, 2016	100% of additional increase necessary to provide all members receiving a pension at December 31, 2014 a lifetime benefit calculated using a 5-year final average benefit formula at their individual date of retirement
January 1, 2017	100% of additional increase necessary to provide all members receiving a pension at December 31, 2015 a lifetime benefit calculated using a 5-year final average benefit formula at their individual date of retirement. As Step 3 was granted a year prior, only members who retired in 2015 are affected.
January 1, 2018	100% of additional increase necessary to provide all members receiving a pension at December 31, 2016 a lifetime benefit calculated using a 5-year final average benefit formula at their individual date of retirement. As Step 3 was granted a year prior, only members who retired in 2016 are affected
January 1, 2019	100% of additional increase necessary to provide all members receiving a pension at December 31, 2017 a lifetime benefit calculated using a 5-year final average benefit formula at their individual date of retirement. As Step 3 was granted a year prior, only members who retired in 2017 are affected
January 1, 2020	100% of additional increase necessary to provide all members receiving a pension at December 31, 2018 a lifetime benefit calculated using a 5-year final average benefit formula at their individual date of retirement. As Step 3 was granted a year prior, only members who retired in 2018 are affected

The following increases have been granted by the Board of Trustees based on the results of the actuarial valuation preceding the effective date of the adjustments and the terms found under "Other Actions", Step 4, of the Funding Excess Utilization Plan of the Funding Policy.

Table D.4 – Step 4 Pension Adjustments

Effective Date	Step 4 Pension Increase (pensioners only)
January 1, 2016	Retroactive lump sum payment necessary to provide all members receiving a pension at December 31, 2014 a lifetime benefit calculated using a 5-year final average benefit formula at their individual date of retirement, retroactive to their pension start date.
January 1, 2017	Retroactive lump sum payment necessary to provide all members receiving a pension at December 31, 2015 a lifetime benefit calculated using a 5-year final average benefit formula at their individual date of retirement, retroactive to their pension start date. As Step 4 was granted a year prior, only members who retired in 2015 are affected.
January 1, 2018	Retroactive lump sum payment necessary to provide all members receiving a pension at December 31, 2016 a lifetime benefit calculated using a 5-year final average benefit formula at their individual date of retirement, retroactive to their pension start date. As Step 4 was granted a year prior, only members who retired in 2016 are affected.
January 1, 2019	Retroactive lump sum payment necessary to provide all members receiving a pension at December 31, 2017 a lifetime benefit calculated using a 5-year final average benefit formula at their individual date of retirement, retroactive to their pension start date. As Step 4 was granted a year prior, only members who retired in 2017 are affected.
January 1, 2020	Retroactive lump sum payment necessary to provide all members receiving a pension at December 31, 2018 a lifetime benefit calculated using a 5-year final average benefit formula at their individual date of retirement, retroactive to their pension start date. As Step 4 was granted a year prior, only members who retired in 2018 are affected.

The following increases have been granted by the Board of Trustees based on the results of the actuarial valuation preceding the effective date of the adjustments and the terms found under "Other Actions", Step 5, of the Funding Excess Utilization Plan of the Funding Policy.

Table D.5 – Step 5 Pension Adjustments

Effective Date	Step 5 Pension Increase (active members only)
January 1, 2016	100% of additional increase necessary to provide all active members a lifetime accrued benefit escalated at the Average Industrial Wage rather than the Consumer Price Index at December 31, 2014.
January 1, 2017	As the Average Industrial Wage index over the year in question was less than the CPI granted in Step 1, Step 5 did not provide any increases.
January 1, 2018	As the Average Industrial Wage index over the year in question was less than the CPI granted in Step 1, Step 5 did not provide any increases.
January 1, 2019	As the Average Industrial Wage index over the year in question was less than the CPI granted in Step 1, Step 5 did not provide any increases.
January 1, 2020	As the cumulative increase in Average Industrial Wage index since the last time Step 5 was granted was less than the cumulative increase of CPI over the same period, Step 5 did not provide any increases.

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 or for sixty months, whichever is the longer. 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. Such automatic form of pension is actuarially equivalent to the normal form of pension.

Optional forms of pension are also available on an actuarially equivalent basis.

Early Retirement and Bridge Benefit

Early retirement is permitted on or after age 55 if the member has at least 5 years of employment or 2 years of plan membership.

On early retirement, a bridge benefit of $18.00 per month per year of pensionable service is payable in addition to the lifetime pension found under "Normal Retirement". The bridge benefit is payable to age 65 or to the death of the member, if earlier, and is not reduced for early retirement.

The portion of the lifetime pension accrued for service before July 1, 2012 is unreduced if the pension commences to be paid at age 60 or later. If such lifetime pension commences to be paid before age 60, it is reduced by 1/4% per month (3% per year) that the lifetime pension commencement date precedes age 60.

The portion of the lifetime pension accrued for service on and after July 1, 2012 is reduced by 5/12% per month (5% per year) that the lifetime pension commencement date precedes age 65.

Benefits on Termination of Employment

If a member terminates employment prior to completing five years of continuous employment and prior to completing two years of plan membership, the member is entitled to a refund of the total amount of his/her contributions to the plan, with interest.

If a member terminates employment before age 55 but after completing at least five years of continuous employment or two years of plan membership, 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 a registered retirement savings arrangement as allowed under the PBA.

Members electing a deferred lifetime pension will also be entitled to retire early in accordance with the "Early Retirement" section, and will also be eligible for a bridge benefit.

Death Benefits

If a member dies prior to completing five years of continuous employment and prior to completing two years of plan membership, the benefit payable is a refund of the member's own contributions to the plan, with interest.

If the member dies after completing at least five years of continuous employment or two years of plan membership, but before pension commencement, the death benefit payable is the termination value of the deferred pension determined in accordance with the PBA.

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 CUPE SRP Plan effective December 31, 2019. 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 CUPE 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

The primary benefit objective for the Plan is to deliver benefits that closely replicate, to the extent possible, the benefits provided under the Plan prior to the conversion, including inflation protection.

Furthermore, benefit accruals under the Plan after the conversion are based on a normal retirement age of 65 with a 5% 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 total contribution rate is equal to 19.1% of earnings (members at 9.0% of earnings and employer at 10.1% of earnings).

Contribution adjustments may be made by the Board of Trustees. A total contribution increase of up to 1% of earnings is to be triggered by the Board of Trustees if the open group funded ratio of the Plan, as defined by the PBA, falls below 100% for two successive year ends 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 contributions of up to a total of 2% of earnings can be triggered by the Board of Trustees if the conditions set forth in the funding excess utilization plan are met.

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 contributions by up to a total of 1.0% of earnings.
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;
3. Change early retirement rules for pre-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 60;
4. Reduce base benefit accrual rates for future service after the date of implementation of the deficit recovery plan by not more than 5%;
5. In addition to the reduction in step 4 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 and when the primary risk management goal is met, no further actions are required at that time.

The base benefit reduction in point 5, if required, shall be such that both goals below are achieved:

1. 105% open group funding level; and
2. Primary risk management goal of 97.5% probability that base benefits need not be further reduced over the next 20 years

Contribution increases shall take effect no later than 12 months following the date of the funding policy valuation report that triggered the need for contribution increases, and all other actions shall take effect no later than 18 months following the date of the funding policy valuation report that triggered the need for the action.

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, there are no actions that can be taken under the funding excess utilization plan.

The amount available for utilization is as follows:

- 1/6th of the excess funds that make up the difference between the open group funding level at the valuation date to a maximum of 140% and 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 full CPI since the last date where full CPI was achieved.
2. Provide further increases in base benefits of members not in receipt of a pension such that the base benefits are upgraded to a final five year average.
3. Provide a further increase to retired members such that a final average formula is reasonably replicated for each retired member at their retirement date and indexed to full CPI thereafter.
4. Provide a lump sum payment representing a reasonable estimate of missed past increased payments up to the levels of benefits arising out of steps 2 and 3.
5. Provide a further increase to benefits of members who were not in receipt of a pension at the funding policy valuation date that triggered the action up to the rate of increase in the average wage.
6. Establish a reserve to cover the next 10 years of potential contingent indexing.
7. Apply contribution reduction adjustment of up to 2%.
8. Improve the normal form of pension for all members who are not in receipt of a pension.
9. Improve the bridge pension for all members eligible for a bridge pension whether or not in pay.
10. Improve the early retirement rules for service after June 30, 2012, provided that the Board of Trustees considers life expectancy experience as it develops.

Action 1 can be applied with excess funds available when the open group funded ratio is below 140%, provided the primary risk management test exceeds 95.0% and the asset mix has not been changed in a manner which increases the investment risk in the prior 6-month period. Actions 2 to 5 can be applied with excess funds available when the open group funded ratio is below 140%, provided the primary risk management test exceeds 97.5%. If all improvements from 1 through 5 above have been made and the open group funded ratio is still in excess of 140%, then actions 6 through 10 can be undertaken in sequence. After such actions have been undertaken, the Trustees may consider permanent benefit changes subject to the approval of the Province and Union 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 December 31st of each year. The discount rate is 4.5% per year and can only be changed with the approval of the Province and the Union. The intention is to keep the discount rate stable over time. Other assumptions may be changed as experience evolves.

Appendix F – Plan Administrator Confirmation Certificate

With respect to the Actuarial Valuation Report of the Shared Risk Plan for CUPE Employees of New Brunswick Hospitals as at December 31, 2019, I hereby confirm that to the best of my knowledge:

- the data regarding Plan members and beneficiaries provided to Morneau Shepell as at December 31, 2019 constitutes a complete and accurate description of the information contained in the files;
- copies of the official plan text and funding policy of the CUPE SRP Plan and all amendments to date were provided to Morneau Shepell; and
- there are no subsequent events other than those described in this valuation report or any extraordinary changes to the plan membership from December 31, 2019 to the date of this valuation report, which would materially affect the results.

Board of Trustees
Shared Risk Plan for CUPE Employees of New Brunswick Hospitals

Brenda Vienneau	L Guitard
Signature	*Signature*
Name: Brenda Vienneau	Name: Larry Guitard
Title: Chair	Title: Vice-Chair
Date: Oct 1/2020	Date: Oct 1, 2020

Morneau Shepell is the only human resources consulting and technology company that takes an integrated approach to employee well-being to meet health, benefits and retirement needs. The Company is the largest administrator of retirement and benefits plans and the largest provider of integrated absence management solutions in Canada. LifeWorks by Morneau Shepell is the leading total well-being solution that combines employee assistance, wellness, recognition and incentive programs. As a leader in strategic HR consulting and innovative pension design, the Company also helps clients solve complex workforce problems and provides integrated productivity, health and retirement solutions.

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