MORNEAU SHEPELL

NEW BRUNSWICK TEACHERS' PENSION PLAN

ACTUARIAL VALUATION REPORT AS AT AUGUST 31, 2016

Report prepared in April 2017

Registration number: Canada Revenue Agency: 0293696

NB Superintendent of Pensions: 0293696

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Introduction

This report was prepared for the Board of Trustees ("Trustees") of the New Brunswick Teachers' Pension Plan ("NBTPP") for the following purposes:

- to document the results of the funding valuation, as required under subsection 17(1) of the New Brunswick Teachers' Pension Plan Act ("TPPA") and provide the related actuarial opinion;
- to document the results of the going-concern actuarial valuation required under subsection 16(1) of the TPPA in order to determine the maximum eligible employer contribution to the NBTPP under subsection 147.2(2) of the Income Tax Act (Canada) ("ITA") and provide the related actuarial opinion;
- to document the results of a hypothetical wind-up valuation of the NBTPP as required under the Canadian Institute of Actuaries Standards of Practice, and provide the related actuarial opinion; and
- to document the results of the risk management procedures as required under section 15 of the TPPA.

The Board of Trustees is also seeking the approval of the Superintendent of Pensions for the following items, as required under the TPPA, the Pension Benefits Act ("PBA") and accompanying Regulations:

- approval of the generational mortality table used in the funding valuation as required under sub-paragraph 17(9)(c)(ii) of the TPPA;
- approval of the asset liability model used, as described in Section 4 of the report, 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 NBTPP retained the services of Morneau Shepell Ltd ("Morneau Shepell") to prepare this report. The report is suitable for filing with the Superintendent of Pensions and with the Canada Revenue Agency.

The last actuarial valuation report prepared for the NBTPP and filed with both the Superintendent of Pensions and the Canada Revenue Agency was performed as at January 1, 2014.

The next actuarial valuation report for the NBTPP will be due no later than August 31, 2019.

Effective September 1, 2016, Supply Teachers as defined in the *Collective Agreement between Board of Management and the New Brunswick Teachers' Federation/la Fédération des enseignants du Nouveau-Brunswick, March 1, 2012 to February 29, 2016* are required to participate in the NBTPP with an "opt-out" option if they meet the following eligibility requirements:

- earn a minimum of 35% of the Year's Maximum Pensionable Earnings (the "YMPE") for each of the prior two consecutive calendar years; and
- have a minimum of 24 months of continuous employment[1] from their most recent hire date.

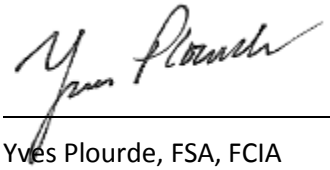
At the time of conducting this valuation, the process of enrollment and opting out related to these new members was still in progress. The addition of these new members would not impact the level of the actuarial liabilities under any of the bases presented in this report. Due to the scarcity of the information related to these future new members, and the likely limited impact on the level of the normal cost and payroll, we did not make any provision for such new members in our valuation. Any impact on our valuation results related to these new members will be recognized in the next actuarial valuation. We are not aware of any other event subsequent to the valuation date which may have a material impact on the results of this valuation.

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 will be revealed in future valuations.

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

Respectfully submitted,



Yves Plourde, FSA, FCIA

May 30, 2017

Date

This report has been peer reviewed by Conrad Ferguson, FSA, FCIA.

Section 1 – Funding Valuation

A funding valuation is required under subsection 17(1) of the TPPA. The results of the funding valuation of the NBTPP as at August 31, 2016 are found below.

The funding valuation results presented in this section are based on asset information found in Appendix A, membership data found in Appendix B, and Plan provisions summarized in Appendix D. The methods and assumptions used in the funding valuation are presented later in this section.

Funding Valuation Funded Status

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

Table 1.1 – Funding Valuation Funded Status

	August 31, 2016	January 1, 2014
	$M	$M
Actuarial Value of Assets		
• Fair market value of assets	$5,481.7	$4,653.2
Funding valuation actuarial liabilities		
• Active members	1,634.1	1,594.7
• Retirees and survivors	3,494.7	3,026.8
• Deferred vested and suspended members	59.9	23.2
• Total	$5,188.7	$4,644.7
Funding valuation excess (unfunded liability)	$293.0	$8.5
Termination value funded ratio [calculated in accordance with subsection 17(7) of the TPPA]	105.6%	100.2%

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 Plan. It is calculated in accordance with subsection 17(7) of the TPPA.

Funding Valuation Normal Costs and Excess Contributions

The table below provides the funding valuation normal cost, being the value of the pension benefits accrued in the twelve-month period after the valuation date. It compares the funding valuation normal cost to the level of member and employer contributions in order to determine the level of contributions being made to the NBTPP in excess of the funding valuation normal cost.

Table 1.2 – Funding Valuation Normal Cost and Excess Contributions

	Year following August 31, 2016 [2]		Year following January 1, 2014 [1]	
	$M	**% of payroll**	**$M**	**% of payroll**
A. Funding valuation normal cost	$103.4	16.91%	$95.6	14.33%
B. Contributions:				
• Members	$61.1	10.00%	$60.0	9.00%
• Employer initial contributions	59.6	9.75%	65.0	9.75%
• Employer temporary contributions:				
- for 5 years after 1.7.2014	4.6	0.75%	5.0	0.75%
- for 10 years after 1.7.2014	4.6	0.75%	5.0	0.75%
- for 15 years after 1.7.2014	4.6	0.75%	5.0	0.75%
Total	$134.5	22.00%	$140.0	21.00%
C. Excess contributions (B. – A.)	$31.1	5.09%	$44.4	6.67%
Estimated payroll for following year	$611.4 M		$667.0 M	

[1] *The contribution rates shown are only applicable from July 1, 2014, effective date of the TPPA.*

[2] *The contribution rates shown are those effective from July 1, 2016.*

Reconciliation of Funding Valuation Funded Status with Previous Valuation

The table below describes the change in the Plan's funded status between the last funding valuation as at January 1, 2014 to this funding valuation as at August 31, 2016:

Table 1.3 – Reconciliation of Funded Status

	$M	$M
Funding valuation excess (unfunded liability) as at January 1, 2014		$8.5
Expected changes in funded status		
• Interest on funding excess (unfunded liability)	1.5	
• Total contributions in excess of normal cost (shortfall) with interest	89.3	
• Total		$90.8
Expected funding valuation excess (unfunded liability) as at August 31, 2016		$99.3
Experience gains (losses) due to the following factors:		
• Investment return on actuarial value of assets different than assumed	464.7	
• Incidence of retirement	12.9	
• Incidence of termination of employment	10.8	
• Incidence of mortality	(6.3)	
• Net gain on estimated accrued benefits for active and suspended members	29.3	
• Indexing of accrued pensions and pensions in payment different than assumed	44.9	
• Other factors	19.7	
• Total		$576.0
Impact of changes in actuarial assumptions		($382.3)
Funding valuation excess (unfunded liability) as at August 31, 2016		$293.0

Reconciliation of Total Normal Cost

The factors contributing to the change in the total normal cost from the last funding valuation as at January 1, 2014 to this funding valuation as at August 31, 2016 are shown below:

Table 1.4 – Reconciliation of Total Normal Cost

	% of payroll
Total normal cost as at January 1, 2014	14.33%
Impact of changes in demographics	0.97%
Impact of changes in assumptions	1.61%
Total normal cost as at August 31, 2016 (see Table 1.2)	16.91%

Funding Valuation Actuarial Methods

Asset Valuation Method

The assets used for the funding valuation are equal to the fair market value of the assets.

Actuarial Cost Method

The funding valuation actuarial liabilities and normal cost were calculated using the accrued benefit (or unit credit) actuarial cost method in accordance with the requirements of subsection 17(9) of the TPPA.

The funding 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. The actuarial liabilities take into account future increases in accrued pensions due to regular cost-of-living adjustments granted to active and retired members.

The funding 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 has been estimated for the year following the valuation date 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 members remain stable. All other things being equal, an increase in the average age of the active 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 Valuation Actuarial Assumptions

The main actuarial assumptions employed for the funding valuation are summarized in the following table. Emerging experience differing from these assumptions will result in gains or losses, which will be revealed in future funding valuations. Experience gains and losses emerging in future funding valuations will impact the 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 1.5 – Funding Valuation Actuarial Assumptions

	August 31, 2016		January 1, 2014	
Discount rate	5.85% per annum		6.25% per annum	
Inflation	2.25% per annum		2.25% per annum	
Indexing of active members accrued pensions	100% of inflation[1]		100% of inflation[1]	
Indexing of retiree pensions and other inactive members accrued pension	75% of inflation[1]		75% of inflation[1]	
Salary increase for year following valuation (for normal cost purposes only)	2.75% plus merit and promotion		2.00% plus merit and promotion	
YMPE increase for year following valuation (for normal cost purposes only)	2.75%		2.75%	
Mortality	CPM2014 Public Sector generational mortality using improvement scale CPM-B, adjusted by 0.90 for males and 0.90 for females GAM71 for disabled members		CPM2014 Public Sector generational mortality using improvement scale CPM-B, adjusted by 1.12 for males and 1.01 for females GAM71 for disabled members	
Spousal age difference	Males 3 years older than females		Males 3 years older than females	
Retirement	If unreduced retirement age[2] attained within 5 years of 1.1.2014: 45% at 85 points 45% at 87 points 10% at 90 points but not later than attainment of 35 years of service or age 60		If unreduced retirement age[2] attained within 5 years of 1.1.2014: 45% at 85 points 45% at 87 points 10% at 90 points but not later than attainment of 35 years of service or age 60	
	If unreduced retirement age[2] attained after 5 years of 1.1.2014: 45% at 89 points 45% at 91 points 10% at 94 points but not later than attainment of 37 years of service or age 62		If unreduced retirement age[2] attained after 5 years of 1.1.2014: 45% at 89 points 45% at 91 points 10% at 94 points but not later than attainment of 37 years of service or age 62	
Disability (Sample rates of disability)	Age	Rate	Age	Rate
	30	0.08%	30	0.08%
	35	0.11%	35	0.11%
	40	0.17%	40	0.17%
	45	0.27%	45	0.27%
	50	0.45%	50	0.45%
	55	0.76%	55	0.76%
	60	1.22%	60	1.22%
Proportion of members married	Active males: 80% Active females: 70% Deferred and pensioners: Varies by age		Active males: 80% Active females: 70% Deferred and pensioners: Varies by age	

[1] Inflation is adjusted down by 0.15%per annum for purposes of indexing to take into account the impact of the 4.75% cap applied under the Plan for indexing purposes.

[2] Unreduced retirement age determined in accordance with the provisions of the Plan applicable to service before July 1, 2014.

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 rate of inflation should be between 2.00% and 2.50%.

Consistent with this range, we have used an inflation assumption of 2.25% per annum.

Discount Rate Development

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

Table 1.6 – Development of Funding Valuation Discount Rate

	%
Expected long-term nominal return (based on the long-term target asset mix, including impact of rebalancing and diversification, and added value for active management)	6.05
Expected investment and administration expenses paid from the fund	(0.20)
Discount rate	5.85

The long-term target asset mix used in our analysis is found in Table A.4 and is in accordance with the Statement of Investment Policies adopted by the Trustees for the NBTPP. The expected long-term nominal return by asset class is provided in Appendix C. It should be noted that the return assumptions for bonds has been determined mainly on current market conditions while the return assumptions for equities and alternative investments are based more on long-term expectations.

Expenses

The allowance for investment management and administrative expenses paid from the fund built into the discount rate is 0.20% of assets based on recent Plan history and our expectation for future expenses.

Rate of Salary Increase

We use a salary increase assumption of 2.75% per annum, based on a difference of 0.5% per annum above inflation.

In addition to the above salary increase, we include a promotional scale to reflect the various steps in pay scales and promotions during the career of a member. The recommended promotional salary scale varies by age and is greater at the younger ages in order to reflect the seniority increases typically granted early in an individual's career. The recommended scale is the same one used in the previous valuation and is equivalent to an additional cumulative increase of approximately 1.5% per annum over the age range 20 to 60, 1.00% per annum over the age range 30 to 60, 0.5% per annum over the age range 40 to 60 and 0.25% per annum over the age range 50 to 60. Thus, the aggregate provision for salary increases range from about 4.25% per annum for a member aged 20 and 3.00% per annum for a member aged 50.

Mortality

To take into account the improved life expectancy of Canadian pensioners as identified by the Canadian Institute of Actuaries in its Canadian Pensioners' Mortality Report released on February 13, 2014, this valuation report uses the mortality table CPM-2014Publ with mortality improvement scale CPM-B, varying by gender, age and calendar year. A mortality study was undertaken using the Plan experience from 2005 to 2015. This study revealed mortality rates that were lower than that produced by the mortality table and projection scale used in the previous valuation. As a result, adjustment factors of 90% for males and 90% for females were adopted for this valuation.

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

Table 1.7 - Life Expectancy for Females and Males

Females					Life expectancy by Age in Year…
Age	2016	2021	2026	2031	2036
55	35.0	35.3	35.5	35.7	36.0
60	30.1	30.4	30.6	30.8	31.1
65	25.3	25.6	25.8	26.1	26.3
70	20.8	21.0	21.2	21.4	21.6
75	16.4	16.6	16.8	17.0	17.2
80	12.3	12.5	12.7	12.8	13.0
Males					**Life expectancy by Age in Year…**
Age	2016	2021	2026	2031	2036
55	32.9	33.2	33.4	33.7	33.9
60	28.1	28.4	28.7	28.9	29.2
65	23.5	23.8	24.0	24.2	24.5
70	18.9	19.2	19.5	19.7	19.9
75	14.6	14.9	15.2	15.3	15.5
80	10.7	11.0	11.2	11.3	11.5

For existing disability pensioners, the mortality table used is the 1971 GAM Table. This table is the same as for the previous valuation for disabled pensioners and remains appropriate for this group of pensioners.

Rate of Increase in YMPE

We have continued to assume in this valuation that the YMPE will increase at the same rate as salary (before merit and promotional increase). As a result, we have used a rate of 2.75% per annum. The YMPE is automatically updated to its revised base level at each valuation date.

Retirement

The early retirement subsidies have changed for service after July 1, 2014. We estimate that members who are a few years from their retirement will not necessarily delay that date. We also estimate that those who are further from retirement will delay that date given the changes in the early retirement subsidies. As a result, we adopted retirement assumptions that vary depending on the number of years separating the member from his/her unreduced retirement age at December 31, 2013. A member who is more than five years from his/her unreduced retirement date at December 31, 2013 is expected to retire later on average than a member who is less than five years from that date. We will continue to monitor this assumption for reasonableness.

Opinion on Funding Valuation

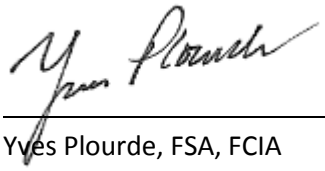
In our opinion, for the purposes of the funding valuation section of the report:

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

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

The assumptions used under the funding valuation of this report were reasonable and consistent with the objectives of the Plan at the time this actuarial valuation report was prepared.

Respectfully submitted,



Yves Plourde, FSA, FCIA

May 30, 2017

Date

Section 2 – Going-Concern Valuation

The going-concern valuation is conducted in accordance with subsection 16(1) of the TPPA in order to determine the maximum eligible employer contribution to the NBTPP under subsection 147.2(2) of the *Income Tax Act (Canada)* ("ITA") and provide the required actuarial opinion.

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

Going-Concern Funded Status

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

Table 2.1 – Going-Concern Funded Status

	August 31, 2016	January 1, 2014
	$M	$M
Actuarial value of assets		
• Fair market value of assets	5,481.7	4,653.2
Going-concern actuarial liabilities		
• Active members	1,981.3	2,449.4
• Retirees and survivors	3,812.8	3,627.9
• Deferred vested and suspended members	73.3	24.9
• Total	5,867.4	6,102.2
Going-concern valuation excess (unfunded liability)	(385.7)	(1,449.0)
Going-concern funded ratio	93.4%	76.3%

Sensitivity Analysis on the Going-Concern Basis

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

Table 2.2 – Sensitivity of Actuarial Liabilities on the Going-Concern Basis

	August 31, 2016	Discount rate 1% lower
	$M	$M
Actuarial liabilities		
• Active members	1,981.3	2,492.2
• Retirees and survivors	3,812.8	4,229.7
• Deferred vested and suspended members	73.3	93.7
• Total	5,867.4	6,815.6
Increase in actuarial liabilities		948.2

Going-Concern Residual Normal Cost

The table below summarizes the estimated going-concern residual normal cost of pension benefits being earned in the twelve-month period after the valuation date.

Table 2.3 – Going-Concern Residual Normal Cost

	As at August 31, 2016		As at January 1, 2014	
	$M	% of payroll	$M	% of payroll
Total normal cost	124.7	20.4	167.7	25.1
Less Member contributions	61.1	10.0	55.7	8.4
Residual normal cost	63.6	10.4	112.0	16.7
Estimated payroll for the following year	611.4		667.0	

Sensitivity Analysis on the Going-Concern Residual Normal Cost

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

Table 2.4 – Sensitivity of Going-Concern Residual Normal Cost

	As at August 31, 2016		Discount rate 1% lower	
	$M	% of payroll	$M	% of payroll
Total normal cost	124.7	20.4	162.4	26.5
Less Member contributions	61.1	10.0	61.1	10.0
Residual normal cost	63.6	10.4	101.3	16.5
Increase in residual normal cost			37.7	6.1

Maximum Eligible Employer Contribution Under the Income Tax Act

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

On the basis of the methods and assumptions in this report, the maximum eligible employer contribution for the year following August 31, 2016 is equal to $449.3M (representing $63.6M of residual normal cost and $385.7M of going-concern unfunded liability).

When spreading the going-concern unfunded liability over the next three years (period for which this going-concern valuation is valid under the PBA), the maximum eligible employer contribution for the three years following August 31, 2016 (ignoring interest and salary increases) would be as follows:

Table 2.5 – Maximum Eligible Employer Contributions Spread Over Three Years

Year following	Gong-Concern Unfunded Liability	Residual Normal Cost	Total	
	$M	$M	$M	% of payroll
August 31, 2016	128.6	63.6	192.2	31.4
August 31, 2017	128.6	60.5	189.1	30.9
August 31, 2018	128.6	60.5	189.1	30.9

Based on the above, the employer contribution requirements under the terms of the NBTPP of 12.0% of payroll (comprised of 9.75% of earnings in initial contributions, and 2.25% of earnings in temporary contributions) are eligible contributions under the ITA. Furthermore, should employer contributions be increased by a maximum of 1.5% of earnings as may be required under the Funding Policy if a deficit recovery plan is applied, those higher employer contributions would also be eligible contributions under the ITA up to the date of the next going-concern valuation scheduled for no later than August 31, 2019.

Going-Concern Valuation Actuarial Methods

The asset valuation method and the actuarial cost method under the going-concern valuation are identical to the asset valuation method and the actuarial cost method under the funding valuation. The going-concern valuation assumptions are also identical, except for the discount rate.

Discount Rate

In order to balance the need to fund intended benefits in a secure and responsible manner, while recognizing the necessity for CRA to monitor the impact of over-conservatism in assumptions, we developed a methodology to select an appropriate discount rate which we believe will balance those concerns. The discount rate selected is determined by using the nominal investment return expected from the long-term asset mix of the NBTPP over the next 20 years at its 75th percentile. This leads to a nominal discount rate of 4.95% per year.

Other going-concern actuarial assumptions

All other assumptions in our going-concern valuation are identical to the assumptions used under the funding valuation detailed in Table 1.5 of Section 1 of this report, and the rationale for the choice of those assumptions also applies for the going-concern valuation.

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

Opinion on Going-Concern Valuation

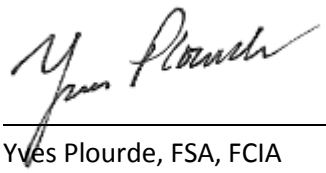
In our opinion, for the purposes of the going-concern valuation section of the report:

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

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

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

Respectfully submitted,



Yves Plourde, FSA, FCIA

May 30, 2017

Date

Section 3 – Hypothetical Wind-Up Valuation

A hypothetical wind-up valuation assumes that the Plan is wound-up on the valuation date and member's 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 plan allowed under the TPPA, 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 plan allowed under the TPPA 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 conducting the hypothetical wind-up valuation as at August 31, 2016, we therefore made the assumption that the conversion to a plan allowed under the TPPA would be void, and that the Plan would be wound-up as at August 31, 2016 in accordance with rules found under Part 1 of the PBA. This assumption has been made solely on the basis that subsection 16(3) would apply, and does not represent a legal opinion on the validity of this scenario.

We have valued the hypothetical 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 fully indexed annuity purchases as at August 31, 2016.

Hypothetical Wind-Up Funded Status

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

Table 3.1 – Hypothetical Wind-Up Funded Status

	August 31, 2016	January 1, 2014
	$M	$M
Assets		
• Fair market value of assets	5,481.7	4,653.2
• Provision for wind-up expenses	(2.5)	(2.5)
• Total	5,479.2	4,650.7
Hypothetical wind-up liabilities		
• Active members	4,285.1	3,376.8
• Retirees and survivors	5,795.9	4,678.7
• Deferred vested and suspended members	170.7	11.0
• Total	10,251.7	8,066.5
Assets less liabilities on the hypothetical wind-up basis	(4,772.5)	(3,415.8)

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

Sensitivity Analysis on the Hypothetical Wind-up Basis

The Standards of Practice of the Canadian Institute of Actuaries require valuation reports to disclose the sensitivity of the liabilities to changes in the discount rate assumption. The table below illustrates the effect 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 3.2 – Sensitivity of Actuarial Liabilities on the Hypothetical Wind-up Basis

	August 31, 2016	Discount rates 1% lower
	$M	$M
Actuarial liabilities		
• Active members	4,285.1	5,814.3
• Retirees and survivors	5,795.9	6,618.6
• Deferred vested and suspended members	170.7	238.2
• Total	10,251.7	12,671.1
Increase in actuarial liabilities		2,419.4

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 August 31, 2016 to August 31, 2017, adjusted for expected benefit payments in the inter-valuation period. This incremental cost is estimated to be $229.6M as at August 31, 2016.

Hypothetical Wind-up Asset Valuation Method

Hypothetical wind-up assets are equal to the fair market value of assets less and 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 TPA was not subject to the PBA before it was converted to the NBTPP, in the absence of specific direction to the contrary in the Former TPA, 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 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 fully indexing annuity purchases as at August 31, 2016.

The primary actuarial assumptions employed for the hypothetical wind-up valuation are summarized in the following table. All rates and percentages are annualized unless otherwise noted. The rates in brackets represent the estimated annuity purchase rates for fully indexed annuities.

Table 3.3 – Hypothetical Wind-Up Actuarial Assumptions

	August 31, 2016	January 1, 2014
Interest rate		
• Interest rate for active members and deferred vested members under 55	2.83% per annum (-0.48% per annum when net of assumed cost-of-living increases)	3.93% per annum (0.15% per annum when net of assumed cost-of-living increases)
• Interest rate for retired members and those 55 and over	2.83% per annum (-0.48% per annum when net of assumed cost-of-living increases)	3.93% per annum (0.15% per annum when net of assumed cost-of-living increases)
Salary increases	None	None
Mortality	CPM2014 generational mortality using improvement scale CPM-B	UP-94 generational using scale AA
Wind-up expenses	$2,500,000	$2,500,000
Retirement	Age which maximizes the value of the pension	Age which 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 fully indexed group annuities for annuitants already retired, based on the suggested rates for such annuitants published by the CIA.

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

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.
- NBTPP conversion would be void and the Plan would be wound-up under Part 1 of the PBA.

Margin for Adverse Deviations

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

Provision for Fees

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

Hypothetical Wind-up Incremental Cost

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

1. Present value of expected benefit payments between August 31, 2016 and August 31, 2017, discounted to August 31, 2016;

   Plus

2. Projected hypothetical wind-up liabilities as at August 31, 2017, discounted to August 31, 2016;

   Less

3. Hypothetical wind-up liabilities as at August 31, 2016.

Opinion on Hypothetical Wind-up Valuation

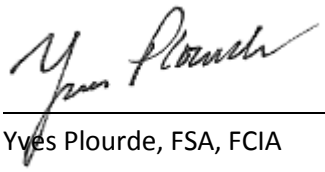
In our opinion, for the purposes of the hypothetical wind-up valuation section of the report:

- 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

May 30, 2017

Date

Section 4 – Risk Management Goals and Procedures

Meeting Risk Management Goal

The NBTPP was designed to achieve or exceed the risk management goal prescribed under the TPPA. Certain procedures were developed to test whether this goal can be achieved. The goal and procedures are described separately below, along with the relevant results of the stochastic analysis required under the TPPA as at August 31, 2016.

Risk Management Goal

The risk management goal under the TPPA is to achieve a 97.5% probability that past base benefits at the end of each year will not be reduced over the 20 years following the valuation.

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

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

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

For the purposes of meeting this goal, base benefits include the accrual of extra service of members and any regular indexing insofar as it is 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 regular 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 goal is measured using an asset liability model with future economic scenarios developed using a stochastic process.

The model was run with 2,000 alternative economic scenarios over 20 years. This exceeds the minimum requirements under the PBA of 1,000 economic scenarios.

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 exceptions noted under the goal above. When modeling the funding deficit recovery plan actions over the 20-year period of each of the 2,000 economic scenarios, each of the first five steps identified in the funding deficit recovery plan under Section IV of the Funding Policy is implemented in sequence until such time as the Plan expects to achieve a closed group funded ratio of 100% over a period of no more than 15 years. A “benefit reduction trial” is recorded (for purposes of the risk management goal calculation) when step 6 or 7 of the funding deficit recovery plan found in Section IV of the Funding Policy is triggered (i.e. a reduction in past base benefits) at any point in the 20-year period of an economic scenario. The

primary risk management measure is therefore the proportion of those 2,000 scenarios that do not lead to a base benefit reduction over a 20-year period. In order to pass the risk management goal, at least 1,950 of those 2,000 scenarios must not trigger a "benefit reduction trial" at any point over the 20-year period.

The asset liability model using a stochastic process requires that a number of important modeling assumptions be made. The main assumptions are described below:

- The economic assumptions are developed for each asset class and for key economic parameters based on a combination of past experience, current economic environment and a reasonable range of future expectations. These assumptions are reviewed annually and updated as required. They are also subject to approval by the Superintendent of Pensions. These assumptions are found in Appendix C.
- For purposes of this report, the Plan's contributing member population is assumed to reduce by 2.00% per year for a period of 2 years following August 31, 2016, and remain stable thereafter in each subsequent year of the projection period. As such, departures from the Plan, for any reason, are assumed to be replaced by the number of new entrants required to respect the said goals that the overall contributing member population reduces by 2.00% per year for a period of 2 years following August 31, 2016, and remains stable thereafter in each subsequent year of the projection period. The new entrant population reflects the profile of new Plan members expected in the future based on Plan experience. The profile of new entrants used for this analysis is found under Table 4.1.

The risk management goal was tested as at August 31, 2016. The result of this test combined with the results of the funding valuation at the same date will determine the actions the Board of Trustees are required to take, or can consider, under the terms of the Funding Policy.

The risk management goal must be achieved or exceeded:

- At January 1, 2014;
- 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 excluding any catch-up related to the level of regular indexing; or
- At the date the contribution adjustments exceeding those set out in the Funding Policy are applied.

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, other than an improvement in scheduled escalated adjustments, or an increase in other ancillary benefits allowed under the Funding Policy.

Additional assumptions on a funding basis for the purpose of the stochastic analysis

Other assumptions are needed for the stochastic analysis required under the risk management procedures for the Plan. These additional assumptions are used to establish future Plan membership as well as future earnings, so as 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 liability and assets at each future date, as well as the present value of possible future funding corrections set out in the Funding Policy.

Table 4.1 – Additional Assumptions for Purpose of the Stochastic Analysis

	August 31, 2016		
New entrants	Active members are replaced at death or retirement by new entrants such that the total active population under the NBTPP reduces by 2.00% per year for a period of 2 years following August 31, 2016, and remains stable thereafter.		
Distribution of new entrants and salary at entry	Age	Distribution	Average Salary at Entry
	23	25.0%	$56,000
	26	25.0%	$56,000
	30	25.0%	$56,000
	40	25.0%	$56,000
Salary at Entry increases	2.75% per annum		
Salary increases (after entry)	2.75% per annum plus merit and promotions as described under the funding valuation		
YMPE increases	2.75% per annum		

Results of stochastic analysis as at August 31, 2016

The stochastic analysis undertaken as at August 31, 2016, took into account the main following items:

- Membership Data as at August 31, 2016 summarized in Appendix B;
- Economic and demographic assumptions as at August 31, 2016 for the funding valuation summarized in Section 1 and the additional assumptions in Table 4.1;
- 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;
- NBTPP provisions summarized in Appendix D;
- Funding deficit recovery plan found under Section IV of the NBTPP's Funding Policy (except for reduction in past base benefits);
- Funding excess utilization plan found under Section V of the NBTPP's Funding Policy (excluding permanent benefit changes).

Based on the above, the result of the stochastic analysis for the risk management goal as at August 31, 2016 is as follows:

Table 4.2 – Risk Management Goal

	Minimum Requirement under TPPA	Result for NBTPP as at August 31, 2016
Risk Management Goal [Subsection 11(1) of TPPA] - There is at least a 97.5% probability that the past base benefits at the end of each year will not be reduced over a 20-year period	97.5%	98.3% PASSED

As indicated in the table above, the risk management goal under the TPPA was achieved as at August 31, 2016, since the 98.3% probability exceeds the minimum requirement of 97.5% under the TPPA.

Appendix A – Assets

Description of Plan Assets

The assets of the Plan are held in a trust fund and are being managed by Vestcor Investment Management Corporation (VIMC). VIMC provided the information on fund assets as at August 31, 2016.

Statement of Market Value

The following table shows the market value of the assets split by broad investment categories as identified in the Plan's unaudited financial statements provided by VIMC as at August 31, 2016.

Table A.1 – Statement of Market Value

	August 31, 2016
	$M
Market value of assets	
• Fixed income	1,735.1
• Equities	2,323.6
• Inflation-linked assets	717.0
• Alternative pools	706.0
Total market value of assets	5,481.7

Changes to Plan Assets

The following table shows changes to the NBTPP assets during the inter-valuation period, based on market values. The reconciliation from January 1, 2014 to August 31, 2016 is based on unaudited financial statements issued by VIMC.

Table A.2 – Reconciliation of Assets

	Sept 1, 2015 to August 31, 2016 ($M)	Sept 1, 2014 to August 31, 2015 ($M)	Jan 1, 2014 to August 31, 2014 ($M)
Assets at beginning of period	$5,241.9	$5,014.9	$4,653.2
Adjustment to market value of assets	-	(0.2)	(0.2)
Receipts			
• Member contributions	58.9	58.5	30.9
• Employer contributions	72.9	72.4	29.7
• Investment income plus realized and unrealized capital appreciation and depreciation	399.2	382.5	488.0
• Total receipts	531.0	513.4	548.6
Disbursements			
• Pensions paid and refunds	281.5	275.7	181.7
• Expenses (fees)	9.7	10.5	5.0
• Total disbursements	291.2	286.2	186.7
Assets at end of period	5,481.7	5,241.9	5,014.9

Return on Assets

The Plan assets earned the following rates of return, net of investment management fees and other expenses charged to the Fund, based on our calculations which assume cash flow occurred in the middle of the period:

Table A.3 – Net Investment Return

Year	%
January 1, 2014 to August 31, 2014 (8 months)	10.5%
September 1, 2014 to August 31, 2015	7.5%
September 1, 2015 to August 31, 2016	7.5%
January 1, 2014 to August 31, 2016 (annualized)	9.6%

Target Asset Mix under the Plan

The Statement of Investment Policies for the NBTPP, as adopted by the Board of Trustees, provides for the following long term target asset mix.

Table A.4 – Target Asset Mix

	Target Allocation (%)
Asset classes	
Fixed income:	
• Short term assets	1.0%
• Government bonds	15.7%
• Corporate bonds	15.7%
Inflation linked:	
• Real return bonds	5.0%
• Real estate	4.0%
• Infrastructure	4.0%
Public equity (market capitalization):	
• Canadian equities	8.0%
• US equities	6.8%
• EAFE equities	6.5%
Public equity (low volatility):	
• Canadian equities	5.0%
• US equities	6.8%
• EAFE equities	6.5%
• Emerging markets equity	3.0%
Private equity	4.0%
Absolute return strategy	8.0%
Total	100.0%

This target asset mix was used to conduct the stochastic analysis required under the NBTPP to assess the risk management goal.

Appendix B – Membership Data

Description OF Membership Data

Data on Plan membership was obtained from the PIBA pension system maintained by Vestcor Pension Services Corporation (VPSC). The data was provided as at August 31, 2016.

The data was matched and reconciled with the data provided for the previous valuation as at April 1, 2013. Basic data checks were performed to ensure that age, salary and service data were reasonable for the purposes of the valuation and to ensure that the data was accurate, complete and consistent with previous data.

The data for accrued pensions of terminated and suspended members did not include the applicable pre-retirement indexing from date of termination to the date of conversion. The correct accrued pensions at date of valuation in respect of pre-conversion service was estimated for valuation purposes for these groups using the accrued pension data provided, adjusted for pre-retirement indexing using a date field provided by VSPC for this purpose.

Summary of Membership Data

The following tables were prepared using data provided by VPSC as at August 31, 2016.

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 August 31, 2016
- B.4 Distribution of Retirees and Survivors by Age Groups as at August 31, 2016
- B.5 Distribution of Deferred Vested and Suspended Members by Age Groups as at August 31, 2016

Table B.1 –Summary of Membership Data

		August 31, 2016	April 1, 2013
Active members	Number	8,121	9,145
	Total covered payroll	$612,391,500	$666,686,700
	Average salary	$75,400	$72,900
	Average accrued lifetime pension	$15,800	n/a
	Average accrued bridge pension	$5,000	n/a
	Average age	42.8	41.8
	Average credited service	13.7 years	12.1 years
Retirees and survivors	Number	9,052	8,562
	Average annual lifetime pension	$29,000	$27,900
	Average annual bridge benefit [1]	$10,000	$9,600
	Average age	71.0 years	69.4 years
Deferred vested and suspended members	Number	1,563	836
	Average accrued lifetime pension	$3,400	n/a
	Average accrued bridge pension	$1,400	n/a
	Average age	45.1 years	48.9 years

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

Table B.2 – Changes in Plan Membership

	Active Members	Retirees and Survivors	Deferred Vested and Suspended Members	Total
Members at April 1, 2013	9,145	8,562	836	18,543
New members	813	-	-	813
Retirements	(799)	835	(36)	-
Members who returned to active status	40	-	(40)	-
Terminations				
• with refunds or transfers out	(111)	-	(148)	(259)
• with deferred pensions	(8)	-	8	-
• suspended	(944)	-	944	-
Deaths				
• with no continuing benefits	(1)	(359)	(1)	(361)
• with survivors	(14)	(154)	-	(168)
New survivor pensions	-	168	-	168
Members at August 31, 2016	8,121	9,052	1,563	18,736

Table B.3 – Age/Service Distribution for Active Members as at August 31, 2016

Years of Service		Age									
		Under 25	25 - 29	30 - 34	35 - 39	40 - 44	45 - 49	50 - 54	55 - 59	60 and over	Total
0 - 4	Number	39	494	353	143	85	66	25	10	6	1,221
	Tot. Sal.	1,633,715	24,327,226	18,408,763	7,703,237	5,198,316	3,737,200	1,310,155	587,062	384,654	63,290,329
	Avg. Sal.	41,890	49,245	52,149	53,869	61,157	56,624	52,406	58,706	64,109	51,835
5 - 9	Number	0	65	707	451	209	113	64	33	6	1,648
	Tot. Sal.	0	4,260,366	51,369,143	33,897,986	15,419,324	8,644,566	4,801,749	2,435,288	353,966	121,182,388
	Avg. Sal.	0	65,544	72,658	75,162	73,777	76,501	75,027	73,797	58,994	73,533
10 - 14	Number	0	0	130	648	500	218	146	60	25	1,727
	Tot. Sal.	0	0	10,444,078	52,577,878	39,800,468	17,222,982	11,570,154	4,735,593	1,931,700	138,282,854
	Avg. Sal.	0	0	80,339	81,139	79,601	79,005	79,248	78,927	77,268	80,071
15 - 19	Number	0	0	0	83	729	430	154	80	38	1,514
	Tot. Sal.	0	0	0	6,859,275	58,990,445	35,011,972	12,422,074	6,461,246	2,999,296	122,744,309
	Avg. Sal.	0	0	0	82,642	80,920	81,423	80,663	80,766	78,929	81,073
20 - 24	Number	0	0	0	0	111	471	191	94	17	884
	Tot. Sal.	0	0	0	0	9,393,844	38,862,456	15,675,096	7,667,353	1,417,955	73,016,704
	Avg. Sal.	0	0	0	0	84,629	82,511	82,069	81,568	83,409	82,598
25 - 29	Number	0	0	0	0	0	179	540	147	17	883
	Tot. Sal.	0	0	0	0	0	15,011,213	44,648,387	12,024,259	1,420,875	73,104,734
	Avg. Sal.	0	0	0	0	0	83,862	82,682	81,798	83,581	82,791
30 - 34	Number	0	0	0	0	0	0	122	94	8	224
	Tot. Sal.	0	0	0	0	0	0	10,227,122	8,053,028	731,548	19,011,698
	Avg. Sal.	0	0	0	0	0	0	83,829	85,671	91,444	84,874
35 and over	Number	0	0	0	0	0	0	0	12	8	20
	Tot. Sal.	0	0	0	0	0	0	0	1,123,174	635,270	1,758,443
	Avg. Sal.	0	0	0	0	0	0	0	93,598	79,409	87,922
Total number		39	559	1,190	1,325	1,634	1,477	1,242	530	125	8,121
Total salaries		1,633,715	28,587,592	80,221,984	101,038,377	128,802,397	118,490,389	100,654,738	43,087,002	9,875,265	612,391,459
Average of salaries		41,890	51,141	67,413	76,255	78,826	80,224	81,042	81,296	79,002	75,408

Average age: 42.8 years

Average number of years of service: 13.7 years

Notes:

The age is computed at the nearest birthday.

The salary used is the member's salary rate as at August 31, 2016.

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

Membership for active members is composed of 1,930 males and 6,191 females.

Table B.4 – Distribution of Retirees and Survivors by Age Groups as at August 31, 2016

Age Group	Number	Total Annual Payments	
		Lifetime	Bridge
Under 55	93	$1,968,950	$422,966
55 - 59	601	$19,855,015	$5,789,940
60 - 64	1,498	$45,397,833	$13,524,541
65 - 69	2,455	$69,637,794	---
70 - 74	1,835	$51,815,540	---
75 - 79	1,214	$35,590,629	---
80 - 84	696	$19,786,444	---
85 - 89	397	$11,739,431	---
90 and over	263	$6,319,387	---
Total	9,052	$262,111,022	$19,737,448

Average age: 71.0 years

Note: Age groups are based on exact age. The pension used is the pension payable as at August 31, 2016. Membership for pensioners is composed of 3,203 males and 5,849 females.

Table B.5 – Distribution of Deferred Vested and Suspended Members by Age Groups as at August 31, 2016

Age Group	Number	Total Annual Deferred Payments	
		Lifetime	Bridge
Under 25	2	$630	$339
25-29	57	$73,372	$36,229
30-34	299	$749,954	$331,378
35-39	247	$814,320	$334,021
40-44	203	$657,426	$275,567
45-49	232	$799,414	$326,800
50 - 54	217	$814,589	$315,662
55 - 59	170	$837,579	$331,575
60 and over	136	$408,986	$167,531
Total	1,563	$5,156,270	$2,119,102

Average age: 45.1 years

Note: Age groups are based on exact age. Membership for deferred pensioners is composed of 318 males and 1,245 females.

Appendix C – Stochastic Projections Assumptions

Our assumptions for 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 a moderate level of conservatism in our assumptions, as high expectations can lead to biased results, understating the true risk level of plans.

Stochastic projection assumptions are updated annually by Morneau Shepell Asset and Risk Management with an anchor date of December 31st and a time horizon of up to 25 years. A multi-stage process is used to set the economic assumptions. First, a long term inflation rate assumption is selected 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. Market implied inflation is used as an indicator of the market expectation for long term trends for inflation. Secondly, historical and current bond data is used to determine the long term interest rates for key bond indices. It is assumed that current yields will revert to the projected long term rates over a projected period. Volatility assumptions are based on historical data modified to reflect current low yield rates. Expected return levels and standard deviations for Canadian bond indices are generated in a stochastic simulation approach.

The next stage is to determine nominal equity return assumptions. The process uses multiple sources including our inflation assumptions, historical data, GDP and other economic data, growth forecasts and dividend information. Standard deviations and correlations of equity returns are mainly derived from historical data. Purchasing power parity is assumed in setting foreign equity return assumptions. Alternative asset classes are primarily based on historical data but adjusted by factors specific for each asset class.

The following expected return and volatility by asset class was used as at August 31, 2016:

Table C.1 – Expected Return Over 20 Years and Volatility (Standard Deviation) by Asset Class

	Expected Return	Volatility (standard deviation)
Inflation	2.25%	1.2%
Asset classes		
Fixed income:		
• Short term assets (ST)	1.80%	1.6%
• Government bonds (GB)	2.75%	7.6%
• Corporate bonds (CB)	3.60%	6.3%
Inflation linked:		
• Real return bonds (RRB)	2.55%	13.4%
• Real estate (RE)	6.25%	10.5%
• Infrastructure (IN)	6.90%	13.6%
Public equity (market capitalization):		
• Canadian equities (Can E)	6.70%	16.7%
• US equities (US E)	6.70%	17.4%
• EAFE equities (EAFE)	7.30%	16.2%
Public equity (low volatility)[1]:		
• Canadian equities (Can Eq LV)	6.20%	13.4%
• US equities (US Eq LV)	6.20%	13.9%
• EAFE equities (EAFE Eq LV)	6.80%	13.0%
• Emerging markets equities (Em Eq LV)	9.50%	24.9%
Private equity (PE)	10.25%	24.2%
Absolute return strategy (ARS)	5.90%	10.5%

[1] *For purposes of our stochastic analysis at August 31, 2016, specific assumptions were made for the public equities (low volatility) strategies. The methodology for deriving assumptions for such strategies was approved by the Superintendent of Pensions in a letter dated August 18, 2015. The conditions ultimately imposed by the Superintendent of Pensions for such strategies are as follows:*

- *Expected long term rate of return of 0.25% to 0.5% lower than regular market capitalization index*
- *Volatility of 80% of the regular market capitalization index*
- *Correlation of 30% lower than regular market capitalization index*
- *Maximum of 25% of the funds in such strategies for modeling purposes, with any excess modeled using the regular market capitalization index assumptions*

For every year in the 20-year projection, expenses of 10 basis points to reflect the cost of passive management and administrative costs is deducted from the assets (the additional cost of active management is expected to be achieved in addition to the expected returns shown above and therefore are not included in the analysis).

The following correlation among the various asset classes identified in Table C.1 was also used as at August 31, 2016:

Table C.2 – Correlation Among Asset Classes

Asset Classes	ST	GB	CB	RRB	Can E	Can Eq LV	US E	US Eq LV	EAFE	EAFE Eq LV	Em Eq LV	PE	ARS	RE	IN
ST	1.00	-0.04	-0.16	-0.24	-0.03	-0.15	0.00	0.00	0.01	0.00	-0.05	-0.04	0.14	0.26	-0.01
GB		1.00	0.87	0.53	-0.08	-0.09	0.01	0.01	-0.14	-0.10	-0.14	-0.04	-0.08	0.02	0.22
CB			1.00	0.57	0.20	0.11	0.14	0.10	0.05	0.04	0.05	0.16	0.16	-0.17	0.22
RRB				1.00	0.23	0.25	-0.14	-0.10	-0.08	-0.06	0.11	0.01	0.14	-0.01	0.42
Can E					1.00	0.48	0.35	0.24	0.59	0.41	0.50	0.51	0.75	0.02	0.14
Can Eq LV						1.00	0.28	0.20	0.35	0.25	0.24	0.33	0.43	0.24	0.14
US E							1.00	0.70	0.67	0.47	0.08	0.63	0.43	0.10	-0.08
US Eq LV								1.00	0.47	0.33	0.05	0.44	0.30	0.07	-0.06
EAFE									1.00	0.70	0.41	0.52	0.42	0.24	-0.05
EAFE Eq LV										1.00	0.29	0.36	0.29	0.17	-0.04
EM Eq LV											1.00	0.19	0.39	0.05	0.06
PE												1.00	0.54	0.06	0.01
ARS													1.00	0.15	0.11
RE														1.00	0.00
IN															1.00

Using a Monte Carlo simulation technique, the expected returns, volatility and correlation of the various asset classes shown above are used to model 2,000 series of alternative economic scenarios over 20-year periods. This provides at least 40,000 observations from which to measure whether the risk management goal has been achieved.

This exceeds the minimum requirements under the PBA of 1,000 series of economic scenarios for 20 years.

For each of these scenarios and for each year, the financial position of the NBTPP is measured on a funding basis. For the purpose of the stochastic analysis, the discount rate remains fixed at 5.85% per annum throughout the projection period. The discount rate of 5.85% per annum is used to project the funding liability and determine the value of any funding correction under the Funding Policy. 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 liability, as required under paragraph 15(2)(c) of Regulation 2012-75.

The risk management procedures are described in Section 4 of this report.

Appendix D – Summary of Plan Provisions

The following is a brief summary of the main provisions of the New Brunswick Teachers' Pension Plan ("NBTPP") as at August 31, 2016. For an authoritative statement of the provisions of the NBTPP, reference must be made to the official NBTPP documents.

Introduction

The New Brunswick Teachers' Federation/Fédération des enseignants du Nouveau-Brunswick, the Province of New Brunswick and the Minister of Finance, in his capacity as governor and administrator of the Former TPA entered into a Memorandum of Understanding pursuant to which they agreed to convert the Former TPA to the NBTPP effective July 1, 2014. As of that date, the *Teachers' Pension Act* ("Former TPA") was repealed by *An Act Respecting Pensions Under the Teachers' Pension Plan Act* (New Brunswick) which provided that the Former TPA be converted to a plan allowed under the TPPA.

Effective July 1, 2014, the NBTPP was created and is administered by an independent Board of Trustees.

Eligibility and Participation

Each Member of the Former TPA joins the NBTPP on July 1, 2014. Each Teacher is required to join the Plan upon employment.

Effective September 1, 2016, Supply Teachers as defined in the *Collective Agreement between Board of Management and the New Brunswick Teachers' Federation/la Fédération des enseignants du Nouveau-Brunswick, March 1, 2012 to February 29, 2016* are required to participate in the NBTPP with an "opt-out" option if they meet the following eligibility requirements:

- earn a minimum of 35% of the Year's Maximum Pensionable Earnings (the "YMPE") for each of the prior two consecutive calendar years; and
- have a minimum of 24 months of continuous employment from their most recent hire date.

Required Contributions

From January 1, 2014 to June 30, 2014, each member is required to contribute 7.3% of earnings up to the YMPE, plus 9.0% of earnings in excess of the YMPE.

From July 1, 2014 to June 30, 2015, each member is required to contribute 8.5% of earnings up to the YMPE, plus 10.2% of earnings in excess of the YMPE.

From July 1, 2015 to June 30, 2016, each member is required to contribute 9.0% of earnings up to the YMPE, plus 10.7% of earnings in excess of the YMPE.

From July 1, 2016 to June 30, 2017, each member is required to contribute 9.5% of earnings up to the YMPE, plus 11.2% of earnings in excess of the YMPE.

From July 1, 2017 to June 30, 2029, each member is required to contribute10.0% of earnings up to the YMPE, plus 11.7% of earnings in excess of the YMPE.

As of July 1, 2029, each member is required to contribute consistent with a contribution formula of 9.25% of earnings up to the YMPE, plus 10.95% of earnings in excess of the YMPE, as defined in the Funding Policy.

From July 1, 2014 to June 30, 2019, the employer is required to contribute 11.5% of earnings up to the YMPE, plus 13.2% of earnings in excess of the YMPE.

From July 1, 2019 to June 30, 2024, the employer is required to contribute 10.75% of earnings up to the YMPE, plus 12,45% of earnings in excess of the YMPE.

From July 1, 2024 to June 30, 2029, the employer is required to contribute 10.0% of earnings up to the YMPE, plus 11.70% of earnings in excess of the YMPE.

From July 1, 2029, the employer is required to match the teachers' contributions.

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

Normal Retirement

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

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

A. In respect of service before July 1, 2014, the product of:

   i. the number of years of the member's pensionable service before July 1, 2014, and

   ii. 1.3% of the annual average of the best five (5) consecutive years of earnings at July 1, 2014, up to the annual average YMPE for 2014, 2013 and 2012, plus 2.0% of the excess of the annual average of the best five (5) consecutive years of earnings at July 1, 2014 over the annual average YMPE for 2014, 2013 and 2012;

and

B. In respect of service from July 1, 2014, the sum of (i) and (ii) for each calendar year (or pro-rated for a portion thereof):

   iii. 1.3% of the Member's annualized earnings for the calendar year, up to the YMPE for the calendar year; and

   iv. 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 regular indexing every January 1st following July 1, 2014, equal to 100% of the increase in the Consumer Price Index (CPI) (subject to a maximum of 4.75%) while the Teacher is active, and equal to 75% of CPI (subject to a maximum of 4.75%) after the Teacher's termination of employment, and contingent on the NBTPP's financial condition as outlined in the Funding Policy.

Normal and Optional Forms of Pension

The normal form of pension is a pension payable in equal monthly instalments commencing on the member's pension commencement date and continuing thereafter during the lifetime of the member. For a member with a spouse or common-law partner at the time of the member's death, 50% of the member's pension (before

application of reductions for early retirement) continues to such spouse or common-law partner in equal monthly instalments for the life of the spouse or common-law partner. Should the member have dependent children at the time of his/her death, such dependent children may be entitled to a pension if there is no spouse or common-law partner or after the death of such spouse or common-law partner. A minimum amount of pension equal to the member's own contribution with interest to retirement will be payable in total.

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

Early Retirement and Bridge Benefit

Early retirement is permitted as of the earliest of age 55, or 35 years of pensionable service or the age at which the member reaches 80 points (or 84 points if the member became a teacher after July 1, 2014).

On early retirement, an annual bridge benefit is payable in addition to the lifetime pension found under "Normal Retirement". The annual bridge benefit is payable to age 65 or to the death of the member, if earlier, and is equal to the sum of:

A. In respect of service before July 1, 2014, the product of:

   i. the number of years of the member's pensionable service before July 1, 2014, and

   ii. 0.7% of the annual average of the best five (5) consecutive years of earnings at July 1, 2014 up to the annual average YMPE for 2014, 2013 and 2012;

and

B. In respect of service from July 1, 2014, for each calendar year (or pro-rated for a portion thereof), 0.7% of the Member's annualized earnings for the calendar year up to the YMPE for the calendar year.

The portions of the lifetime pension and bridge benefit accrued for service before July 1, 2014 are unreduced if the pension and bridge commence to be paid upon or after fulfilment of one of the following criteria:

- Achievement of the 87 points rule (age + years of pensionable service)
- Age 60 and 20 years of pensionable service
- 35 years of pensionable service
- Age 65 and 5 years of continuous service or 2 years of pensionable service or Plan membership

If payment commences before any of these criteria are met, the lifetime pension and bridge benefit shall each be reduced by 5/12% per month (5% per year) that the pension and bridge commencement date precedes the first day of the month in which the criterion is met.

The portions of the lifetime pension and bridge benefit accrued for service on and after July 1, 2014 are reduced by 5/12% per month (5% per year) that the pension and bridge commencement date precedes the first day of the month following the first of the following events:

- Achievement of the 91 points rule (age+ years of pensionable service)
- Age 62 and 20 years of pensionable service
- 35 years of pensionable service

- Age 65 and 5 years of continuous service or 2 years of pensionable service or Plan membership.

Benefits on Termination of Employment

If a member terminates employment prior to completing 5 years of continuous service and prior to completing 2 years of pensionable service or Plan membership, the member is entitled to a refund of the total amount of his/her contributions to the NBTPP and Former TPA, if any, with interest.

If a member terminates employment before age 55 but after completing at least 5 years of continuous service or 2 years of pensionable service or Plan membership, the member may elect to receive:

i. a deferred lifetime pension payable from the 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 calculated in accordance with the TPPA, 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 5 years of continuous service and prior to completing 2 years of pensionable service or Plan membership, the benefit payable is a refund of the member's own contributions to the NBTPP and Former TPA, if any, with interest.

If the member dies after completing at least 5 years of continuous service or 2 years of pensionable service or Plan membership, but before pension commencement, the death benefit is as follows:

- a pension of 50% of the accrued lifetime pension payable to the surviving spouse or surviving common-law partner; or to dependent children if there is no surviving spouse or following the death of the surviving spouse an amount equal to the spouse's pension (split equally among dependent children). Any amount by which the Termination Value exceeds the aggregate of all pension payments made above, shall be paid to the designated beneficiary(ies) or estate.

- If no pension is payable to the surviving spouse or the surviving common-law partner, and if there is no dependent child or dependent at the time of death, the benefit payable is a refund of the member's own contributions to the NBTPP and Former TPA, if any, with interest, to the estate.

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.

Primary Goal, Benefit Security and Cost-of-Living Adjustments

The primary goal of the NBTPP is to provide pensions to eligible teachers after retirement and until death in respect of their service as teachers. A further purpose of this NBTPP is to provide secure pension benefits to members without an absolute guarantee but with a risk-focused management approach delivering a high degree of certainty that full base benefits will be payable in the vast majority of potential future economic scenarios. As a plan allowed under the TPPA, all future cost-of-living adjustments and other ancillary benefits under the

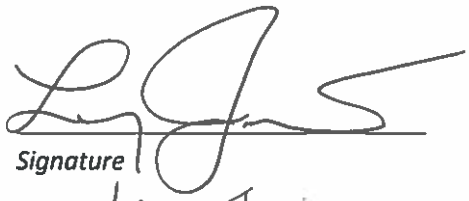
NBTPP shall be provided only to the extent that funds are available for such benefits, as determined by the Board of Trustees in accordance with applicable laws and the Funding Policy.

Appendix E – Plan Administrator Confirmation Certificate

With respect to the Actuarial Valuation Report of the New Brunswick Teachers' Pension Plan as at August 31, 2016, I hereby confirm that to the best of my knowledge:

- the data regarding Plan members and beneficiaries provided to Morneau Shepell as at August 31, 2016 constitutes a complete and accurate description of the information contained in our files;
- copies of the official Plan text, Funding Policy and Statement of Investment Policies of the NBTPP and all amendments to date were provided to Morneau Shepell; and
- there are no subsequent events or any extraordinary changes to the Plan membership from August 31, 2016 which would materially affect the results, other than those noted in this report.

The NBTPP Board of Trustees



Signature

Name: Larry Jamieson

Title: Chair

Date: May 29, 2017

MORNEAU SHEPELL

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