Uniformed Services Pension Plan for the Province of Newfoundland and Labrador

Actuarial Valuation as at December 31, 2017 for Funding Purposes

Report prepared September 2018

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Introduction

This report presents the results of the actuarial valuation as at December 31, 2017 of the Uniformed Services Pension Plan for the Province of Newfoundland and Labrador ("the Plan"). The Government of Newfoundland and Labrador ("the Government") retained the services of Morneau Shepell Ltd ("Morneau Shepell") to perform this actuarial valuation. The last complete valuation that was filed with the Newfoundland and Labrador Superintendent of Pensions and the Canada Revenue Agency was performed as at December 31, 2014.

This report was prepared for the Government for the following purposes:

- to determine the funded status of the Plan on the going-concern basis;
- to determine the funded status of the Plan on both solvency and hypothetical wind-up bases;
- to estimate the Government contributions required under the Plan during the period from this valuation date up to the next valuation; and
- to provide the information and the actuarial opinion required by the Newfoundland and Labrador *Pension Benefits Act, 1997,* and the *Income Tax Act* (Canada).

Events since the last valuation as at December 31, 2014

New collective agreements have been signed with the RNC employees and correctional officers providing for a temporary salary freeze:

- For RNC employees, April 1st 2018, 2019, and 2020 contractual salary increases are nil;
- For correctional officers, November 1st 2018 contractual salary increase is nil.

These freezes have been reflected in this report.

Terms of engagement

This report takes into account the terms of engagement letter dated September 12, 2018. In accordance with this letter, no provision for adverse deviations is included in our results.

Changes since previous valuation

The solvency and hypothetical wind-up bases have been updated to reflect market conditions as at the valuation date. In addition, changes were made to the actuarial assumptions on the going-concern basis. A summary of the going-concern methods and assumptions is provided in Appendix A. A summary of the hypothetical wind-up and solvency methods and assumptions is provided in Appendix B.

Restriction on use of this report

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

Section 1 – Actuarial Opinion

This opinion is given with respect to the registered pension plan ("RPP") portion of the Uniformed Services Pension Plan for the Province of Newfoundland and Labrador ("the Plan"). We performed a valuation of the Plan as at December 31, 2017, based on the Plan provisions and data as at that date. The Government has confirmed that, between December 31, 2017 and September 2018, no subsequent events, modifications or extraordinary changes to the membership or the Plan that would materially affect the results of this actuarial valuation have occurred, except as indicated in this report.

We hereby certify that, in our opinion, as at December 31, 2017:

- The Plan is not fully funded on the going-concern basis. The actuarial liabilities exceed the actuarial value of assets by $287,575,000.
- The Plan has a solvency deficiency of $468,068,000.
- The Plan assets would have been less than the actuarial liabilities by approximately $468,068,000 if the Plan had been wound up on the valuation date.
- The solvency ratio of the Plan, as defined under the Newfoundland and Labrador *Pension Benefits Act, 1997*, is equal to 27.8%.
- The total normal cost for the 12-month period following the valuation is equal to 17.7% of projected payroll, estimated to be $9,480,000.
- At the valuation date, member contributions are, in aggregate, 8.8% of projected payroll, estimated to be $4,699,000 for the 12-month period following the valuation. With Government matching contributions of 8.8% of payroll, the normal cost deficit is 0.1% of projected payroll, estimated to be ($70,600) for the 12-month period following the valuation.
- In accordance with Section 7 of the *Uniformed Services Pensions Act, 2012,* the minimum Government contribution in the 12-month period following the valuation is estimated to be $4,710,000 or 8.8% of projected payroll.

These contributions conform to the eligibility requirements of the *Income Tax Act* (Canada) if contributed within the fiscal year or remitted within 120 days after the end of the fiscal year.

In our opinion, for the purposes of this 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 report has been prepared, and our opinion given, in accordance with accepted actuarial practice in Canada.

The assumptions that form the going-concern basis used in this report were reasonable at the time this actuarial valuation report was prepared and contributions were determined.

This actuarial valuation was performed in accordance with the going-concern and solvency standards prescribed under the Newfoundland and Labrador *Pension Benefits Act, 1997*.

The calculations in the actuarial valuation report have been prepared in accordance with subsection 147.2(2) of the *Income Tax Act* (Canada).

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 Plan administrator, the Government or the members 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 may result in gains or losses, which may affect future contribution levels. These gains or losses will be revealed in future actuarial valuations.

The next actuarial valuation will have to be performed not later than as at December 31, 2020.

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

Stephen Kelloway, FCIA	Maude Trudeau-Morin, FCIA
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Section 2 – Going-Concern Funded Status

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.

Table 2.1 – Going-Concern Funded Status

	December 31, 2017	December 31, 2014
	$000	$000
Actuarial value of assets		
Market value	182,224	180,566
In transit	(1,728)	-
Total	180,496	180,566
Actuarial liabilities		
Active and transferred members	145,802	156,876
Deferred pensioners and pending transfers	1,008	675
Retired members and beneficiaries	321,261	273,314
Total	468,071	430,865
Actuarial surplus (unfunded liability)	(287,575)	(250,299)
Funding ratio	38.6%	41.9%

Reconciliation of Going-Concern Funded Status

The table below describes the change in the Plan's going-concern funded status since the last valuation:

Table 2.2 – Reconciliation of Going-Concern Funded Status

	$000	$000
Actuarial surplus (unfunded liability) as at December 31, 2014		(250,299)
Expected changes in funded status		
Interest on actuarial surplus (unfunded liability)	(54,184)	
Contributions in excess of the cost of service accruals	681	
Total		(53,503)
Expected surplus (unfunded liability) as at December 31, 2017		(303,802)
Actuarial gains (losses) due to the following factors		
Investment return on market value of assets (actual average annual return of 10.5% vs expected of 6.75%)	19,793	
Salary experience	6,138	
Mortality experience	1,257	
Retirement experience	5,246	
Disability experience	85	
Data corrections	1,002	
Other factors	285	
Total		33,806
Other gains (losses)		
Changes in actuarial assumptions		
– Changes in salary assumptions and discount rate	(24,530)	
– Recognition of wage freeze per collective agreements	6,951	
Total		(17,579)
Actuarial surplus (unfunded liability) as at December 31, 2017		(287,575)

Sensitivity Analysis on the Going-Concern Basis

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 2.3 – Sensitivity of Actuarial Liabilities on the Going-Concern Basis

	December 31, 2017	Discount rate 1% lower
	$000	$000
Actuarial liabilities	468,070	528,383
Increase in actuarial liabilities		60,313

Section 3 – Solvency and Hypothetical Wind-Up Funded Status

Solvency Funded Status

A solvency valuation is a hypothetical valuation prescribed by the Newfoundland and Labrador *Pension Benefits Act, 1997*. As all benefits have been included, the Plan's solvency financial position is identical to the wind-up financial position.

Table 3.1 – Solvency Funded Status

	December 31, 2017	December 31, 2014
	$000	$000
Solvency assets		
Market value of assets	182,224	180,566
In transit	(1,728)	-
Wind-up expenses	(600)	(600)
Total	179,896	179,966
Solvency liabilities		
Active and transferred members	197,036	233,036
Deferred pensioners and pending transfers	2,030	1,597
Retired members and beneficiaries	448,898	399,270
Total	647,964	633,903
Assets less liabilities on the solvency basis	(468,068)	(453,937)
Solvency ratio	27.8%	28.4%

Solvency Ratio

The solvency ratio is equal to the ratio of the solvency assets to the solvency liabilities as indicated in Table 3.1.

Hypothetical Wind-up Funded Status

Since all benefits have been valued, if the Plan had been liquidated as at December 31, 2017 and assuming that the asset liquidation value had been equal to the market value, the hypothetical wind-up funded status would have been similar to the solvency funded status shown in Table 3.1.

Sensitivity Analysis on the Solvency Basis

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

Table 3.2 – Sensitivity of Actuarial Liabilities on the Solvency Basis

	December 31, 2017	Discount rates 1% lower
	$000	$000
Actuarial liabilities	647,964	753,992
Increase in actuarial liabilities		106,028

Incremental Cost on the Solvency Basis

The incremental cost on the solvency basis represents the present value of the expected aggregate change in the solvency liabilities from December 31, 2017 to December 31, 2020, adjusted for expected benefit payments in the inter-valuation period. This incremental cost is estimated to be $29,729,000 as at December 31, 2017.

Section 4 – Normal Cost and Amortization Payments

Normal Cost

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

Table 4.1 – Normal Cost

	2018	2015
	$000	**$000**
Total normal cost	9,480	9,198
Estimated member required contribution*	4,699	4,699
Estimated Government required contribution	4,710	4,711
Estimated contribution excess (deficit)	(71)	212
Following year expected payroll	53,502	53,618
Total estimated contribution as a percentage of payroll	17.6%	17.6%
Total normal cost as a percentage of payroll	17.7%	17.2%
Contribution excess (deficit) as a percentage of payroll	(0.1%)	0.4%

* *Member contributions are capped at 9% of pay (the maximum contribution to the registered pension plan), while Government contributions are matched to total member contributions without recognition of the 9% cap.*

The normal cost for firefighters and non-firefighters are shown separately below:

Table 4.2 – Normal Cost by Division

	Firefighters	Non-Firefighters
	$000	**$000**
Total normal cost	276	9,204
Estimated member required contribution*	109	4,590
Estimated Government required contribution	112	4,598
Estimated contribution excess (deficit)	(55)	(16)
Following year expected payroll	1,211	52,290
Total estimated contribution as a percentage of payroll	18.2%	17.6%
Total normal cost as a percentage of payroll	22.8%	17.6%
Contribution excess (deficit) as a percentage of payroll	(4.5%)	(0.0%)

In the case of the remaining closed group of firefighters, the overall normal cost can be expected to increase as a percentage of payroll as the group continues to mature. However, based on the age and service of the group, we note that the relative size of the group is expected to decline rapidly as members retire, as will its overall impact on total normal cost.

Reconciliation of Normal Cost

The factors contributing to the change in the normal cost are shown below:

Table 4.3 – Reconciliation of Normal Cost

	% of Payroll
Normal cost as at December 31, 2014	17.2%
Demographic changes of active members	(0.3%)
Changes in assumptions and methods	1.5%
Salary increases freeze for RNC employees and correctional officers	(0.7%)
Normal cost as at December 31, 2017	17.7%

Sensitivity Analysis on the Going-Concern Basis

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

Table 4.4 – Sensitivity of Normal Cost on the Going-Concern Basis

	As at December 31, 2017	Discount Rate 1% Lower
	$000	$000
Normal cost	9,480	11,950
Increase in normal cost		2,470

Amortization Payments

Government contributes to the Plan in accordance with Section 7 of the *Uniformed Services Pensions Act, 2012,* which requires the Government to match required members contributions. The Plan is exempt from the funding requirements set out in the Newfoundland and Labrador *Pension Benefits Act* and *Regulations.*

There are no legislative requirements to make amortization payments to liquidate the Plan's going-concern unfunded liability at the valuation date (nor are additional Government contributions required to cover any normal cost funding deficit). However, the following table demonstrates the annual payments that would be required over various periods in order to eliminate the going-concern unfunded liability of $287,575,000 (note that these calculations do not considered the normal cost deficit created by the current matching contribution levels under the normal cost).

Table 4.5 – Amortization Payments

	Over 20 Years	Over 30 Years	Over 40 Years
Fixed annual payment (in $000's)	24,819	20,813	19,129
Annual payment as a fixed % of projected payroll	36.7%	28.0%	23.9%

These amortization payment schedules have been provided for illustrative purposes only as there is no legislative requirement for Government to contribute more than the required member contributions.

Appendix A – Going-Concern Actuarial Basis

Asset Valuation Method

The actuarial value of the assets used to determine the going-concern funded status is equal to the market value, adjusted for amounts payable and receivable. This method is the same as the one used in the last valuation.

Actuarial Cost Method

The actuarial liabilities and the normal cost on the going-concern basis were calculated using the projected accrued benefit (or projected unit credit) actuarial cost method.

The 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 assumptions as indicated hereafter.

The normal cost is equal to the actuarial present value of benefits expected to be earned by members in the year following the valuation date. The residual normal cost is the excess of the normal cost over employees' required contributions.

The valuation method for determining the actuarial liabilities and the normal cost is the same as the one used in the last valuation.

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, the age has been calculated by rounding to the nearest birthday.

Actuarial Assumptions

The main actuarial assumptions used in the going-concern valuation are summarized in the following table. Some assumptions used in this valuation are different from those used in the previous valuation. For comparison purposes, the assumptions used in the last valuation are also included in the table. All rates and percentages are annualized unless otherwise noted.

Table A.1 – Going-Concern Actuarial Assumptions

	December 31, 2017	December 31, 2014
Discount rate	6.25%	6.75%
Inflation	2.25%	2.50%
Salary increases		
> Non-Firefighters	RNC: Contractual increase of 3.00% starting from January 1, 2021 plus merit and promotion of 11.75% in the first four years of service, then 0.75% up to the 24th year of service; 1.00% thereafter	RNC: 15.00% in the first four years of service, then 4.00% up to the 24th year of service; 4.25% thereafter
	Correctional Officers: Contractual increase of 3.00% starting from January 1, 2020 plus merit and promotion of 0.75% per year	Correctional Officers: 3.75% in the first year after the valuation and 4.00% thereafter
> Firefighters	3.75%	4.00%
YMPE increases	3.00%	3.25%
Mortality	CPM-RPP2014 Public Table with generational projection using improvement scale CPM-B adjustment factors of 1.1 for males and females Sex-distinct	Same
Termination (membership)	None	Same
Disability	<u>Age</u> / <u>Percentage</u> 35 and under: 0.10% 40: 0.15% 45: 0.30% 50: 0.80% 55: 0.00%	Same
Retirement		
> Non-Firefighters	RNC: 25% at 25 years of service and the remainder at 30 years of service Correctional Officers: 50% at 25 years of service and the remainder at 30 years of service. No active members are assumed to work beyond age 60.	Same
> Firefighters	20% at 25 years of service, 50% of the remainder at 30 years of service and the remainder at 35 years of service. No active members are assumed to work beyond age 60. The earliest a member is assumed to retire is 1 year after the valuation date.	

	December 31, 2017	December 31, 2014
% with eligible survivors	At retirement or death: 85%	Same
Difference in age between spouses	Male is 3 years older than female	Same
Provision for expenses	Implicitly recognized in the interest rate	Same

Choice of Assumptions

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

Inflation rate

As stated in its monetary policy, the Bank of Canada aims to keep inflation at the 2% target, i.e. the midpoint of the 1% to 3% inflation-control target range. Given historical increases in consumer prices in Canada, the rates expected by the market, portfolio managers' expectations and the Bank of Canada policy, an expected rate of inflation of 2.25% has been retained.

Expected Real Return

Morneau Shepell annually develops expected long-term asset class returns. These returns are established by reviewing historical real returns for various periods, current market conditions as well as fund managers' long-term expectations. Using these expected long-term real returns and the Plan's target asset mix we develop an expected long-term real return for the Plan as follows:

Table A.2 – Expected real return by asset class (passive management)

Asset classes	Target asset mix	Expected real return
	%	%
Canadian universe bonds	20.0	0.80
Canadian equity	25.0	4.45
Global equity	55.0	4.95
Total expected real return		4.00

Expected Value Added for Active Management

Additional investment management fees of 0.30% are associated with the active management of the Plan's assets over those for passive management. Consequently, in accordance with the CIA's Educational Note – Determination of Best Estimate Discount Rates for Going Concern Funding Valuations published in December 2010, we have assumed that active management will add value (provide returns above index returns) of 0.30% for the purpose of this valuation.

Portfolio Rebalancing and Effect of Diversification

Portfolio rebalancing affects a diversified portfolio's expected long-term return. In other words, realigning a portfolio's weightings to the target determined in the investment policy from time to time will have an impact on the long-term return. The impact of portfolio rebalancing depends on its frequency, the weightings between asset classes and the investment horizon. Our stochastic projections show that rebalancing generally has a modest but positive impact.

The expected return is also influenced by the level of diversification of the portfolio. The correlations between the asset categories play a positive impact on the portfolio's total expected return. Therefore, a portfolio's expected long-term return should include the impact of rebalancing and diversification.

For the Plan's portfolio, our stochastic projection suggests that the impact of rebalancing and diversification on the portfolio's return is 0.32%.

Margin for Adverse Deviations

As directed by the Government, the discount rate does not include a margin for adverse deviations. The December 31, 2014 valuation included a margin of 0.25%.

Investment and Administrative Expenses

We have reviewed investment and administration expenses for the Plan to reflect changes expected due to the removal of the Teachers' Pension Plan and the Public Service Pension Plan from the Pooled Pension Fund and Pensions Division administration branch. We believe that an assumption of 0.63% is a reasonable estimate of on-going expenses. For the December 31, 2014 valuation, expenses were assumed to equal 0.30% of assets annually.

Discount rate

The resulting development of the discount rate assumption for going-concern purposes is summarized in the table below:

Table A.2 – Discount Rate

	%
Expected rate of inflation	2.25
Expected real return on assets	4.00
Value added for rebalancing and diversification	0.32
Value added for active management	0.30
Expenses	(0.63)
Margin for adverse deviations	0.00
Discount rate (before rounding)	6.24

The final discount rate has been rounded to 6.25%.

Salary increases

The assumed rates of annual salary increase have been set equal to the assumed rate of increase in the YMPE (representative of general wage increases experienced nationally and equal to 3.00%) plus an component in respect of merit and promotional increases. For corrections officers and fire fighters, an additional 0.75% is added in respect of future merit and promotional increases.

In the case of RNC members, an additional merit increase of 11.75% over each of the first four years of a member's career and then 0.75% up to 24th year of service has been included to reflect set pay increases during the initial years of a member's employment. Beginning in the 24th year of service, an additional 1.00% merit increase is included to reflect actual salary experience relating to promotions to more senior management positions.

To reflect salary increase freeze provided in the collective agreements, correctional officers are assumed to have no contractual salary increase in the first 2 years following the valuation date and RNC employees are assumed to have not contractual salary increase in the first 3 years following the valuation date.

Retirement assumption

We maintained the retirement assumptions since the prior valuation. This assumption is based on historic plan experience and plan provisions. The results obtained in the next actuarial valuations will continue to be monitored and the assumptions adjusted if necessary.

Mortality assumption

For the last actuarial valuation as at December 31, 2014, the mortality assumption used was based on the CPM-2014 Public mortality table adjusted by 110% for both males and females, and the CPM-B generational projection scale, which varies by gender, age, and calendar year. Adjustments of 110% for both males and females reflect the industry group covered and is expected to be a conservative estimate given the Plan's historical experience. The mortality assumption as at December 31, 2017 remains unchanged since the last valuation.

Spousal assumption

Difference of age between spouses and % with eligible survivors assumptions are only used for non-retired members. For pensioners, information on the member's marital status and the actual spouse's age, if any, were used.

All other assumptions are the same as those used in the last actuarial valuation.

Appendix B – Solvency and Hypothetical Wind-Up Actuarial Basis

Asset Valuation Method

The actuarial value of the assets used to determine the solvency and hypothetical wind-up funded status is equal to the market value of assets, adjusted for amounts payable and receivable less an allowance for wind-up expenses. This valuation method is the same as the one used in the last valuation.

Actuarial Cost Method

The solvency and wind-up liabilities are determined using the accrued benefit (or unit credit) actuarial cost method. The solvency 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 (and treating all members as if vested). This method is the same as the one used in the last valuation.

Each member's age has been calculated by rounding to the nearest birthday.

Actuarial Assumptions

The main actuarial assumptions used in the solvency and hypothetical wind-up valuations correspond to those prescribed by the applicable legislation.

These assumptions are summarized in the following table. For comparison purposes, the assumptions used in the last valuation are also included. All rates and percentages are annualized unless otherwise noted.

In accordance with Directive #9 to the Newfoundland and Labrador *Pension Benefits Act, 1997*, the minimum wind-up liability is equal to the premium required to purchase the accrued pension from an insurance company.

Table B.1 – Solvency and Hypothetical Wind-Up Actuarial Assumptions

	December 31, 2017	December 31, 2014
Discount rates		
> Active members not eligible for immediate retirement	2.60% for 10 years and 3.40% thereafter.*	2.50% for 10 years and 3.80% thereafter.*
> Pensioners, deferred pensioners and active members eligible for immediate retirement	3.12%	2.74%
Mortality	CPM2014 with full generational mortality improvement, using Scale CPM-B Sex distinct	1994 Uninsured Pensioners Mortality Table with generational projection with Scale AA. (UP94GT) Sex distinct
Retirement	Age that maximizes the value of the pension. All members assumed to retire immediately at the earliest date that they meet the eligibility requirements.	Same
Married %	85%	Same
Spousal age difference	Male is 3 years older than female	Same
Wind-up expenses	$600,000	Same

* *For active and deferred vested members each member's solvency and wind-up liability is, at a minimum, equal to the cost to purchase an annuity from an insurance company.*

Termination scenario

The termination scenario used in the solvency and hypothetical wind-up valuations includes the following assumptions:

- Plan wind-up would not result from employer insolvency.
- All assets could be realized at their reported market value.
- Membership in the Plan ceases on the valuation date.
- No projection of salaries and YMPE are assumed to occur after the valuation date for active members.

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

Margin for adverse deviations

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

Choice of Assumptions

Discount Rate

The Canadian Institute of Actuaries ("CIA") collects data from insurance companies and annually determines discount rates suitable for estimating the cost of single premium group annuities in solvency and hypothetical wind-up valuations. For pensioners and active or deferred vested members eligible for immediate retirement at the valuation date, the discount rate used in the present solvency and 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 would normally be either 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, or the discount rate for commuted values, depending on which rate maximizes the individual liabilities. This maximum liability has been valued on an individual basis for all active members and deferred vested members not eligible for immediate retirement. All solvency and hypothetical wind-up valuation results are therefore prepared under the fully indexed annuity purchase basis.

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

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. 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.

Mortality assumptions

On June 15, 2015, the Actuarial Standards Board promulgated the use of the 2014 Canadian Pensioner Mortality Table (CPM2014), combined with improvement scale CPM Improvement Scale B (CPM-B), for use in the calculation of pension commuted values, effective October 1, 2015. As such, the mortality table used for the valuation on the going-concern basis as at December 31, 2017 was changed from UP94 generational mortality with improvement scale AA to reflect the improvements in life expectancy substantiated by the Canadian Institute of Actuaries in its report on Canadian Pensioners' Mortality.

Incremental Cost

The incremental cost on the solvency basis is based on the actuarial method and assumptions described below.

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

1. Determine the present value of expected benefit payments between December 31, 2017 and December 31, 2020, discounted to December 31, 2017;
2. Add projected solvency liabilities as at December 31, 2020, discounted to December 31, 2017;
3. Subtract solvency liabilities as at December 31, 2017.

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 calculation of incremental cost is based on the following assumptions:

> 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, 2017.

> 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, 2017, taking into account the method of settlement applicable to each member as at December 31, 2020.

> However, we assume that the discount rates remain at the levels applicable as at December 31, 2017 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, 2017 remain in effect as at December 31, 2020.

> The projected solvency liabilities as at December 31, 2020 in item 2. above is calculated using the same postulated scenario as is used for the solvency valuation as at December 31, 2017.

> The rates used to discount items 1. and 2. above from December 31, 2020 to December 31, 2017 correspond to those used for the solvency valuation as at December 31, 2017. However, these rates are adjusted to take into account the applicable method of settlement applicable to each member as at December 31, 2020.

Appendix C – Assets

Source of Information

We have relied upon the audited financial statements provided by the Province of Newfoundland and Labrador for the following information.

Changes in Net Assets

The following table shows changes affecting the assets during the intervaluation period, based on market values.

Table C.1 – Reconciliation

	2015	2016	2017
	$000	$000	$000
Market value of fund at beginning of year	180,566	177,812	181,853
Adjustments	-	-	-
Adjusted market value at beginning of year	180,566	177,812	181,853
Receipts			
> Member contributions	4,760	4,617	4,657
> Government contributions	4,464	4,548	4,543
> Special Government contributions	-	-	-
> Investment return	13,352	20,847	21,133
Total receipts	22,576	30,012	30,333
Disbursements			
> Pension payments	24,445	25,519	26,779
> Lump sum payments	292	39	2,599
> Expenses	593	413	584
Total disbursements	25,330	25,971	29,962
Payables	-	-	(1,728)
Market value of fund at end of year	**$177,812**	**$181,853**	**$180,496**

Return on Assets

The Plan assets earned the following annualized rates of return, net of investment management fees and other expenses charged to the fund:

Table C.2 – Investment Return (net of expenses and in $000's)

Year	Market Value Basis	Excess Investment Gain / (Loss)*
Jan. 1, 2015 to Dec. 31, 2015	7.4%	1,094
Jan. 1, 2016 to Dec. 31, 2016	12.0%	8,985
Jan. 1, 2017 to Dec. 31, 2017	12.0%	8,955

** Relative to the going-concern valuation assumption in effect for that year (6.75% in 2015-17).*

Appendix D – Membership Data

Description of Membership Data

Our valuation is based on data provided to us by the Government's Pensions Administration Division, and was compiled as at December 31, 2017. We have taken the following steps to review the data to ensure sufficiency and reliability:

> Basic data checks were performed to ensure that age, salary and service data were reasonable for the purposes of the valuation.

> The membership was reconciled with the previous valuation and queries were submitted to the Government.

> A reconciliation was prepared in order to follow the changes concerning some of the active members, retirees and vested members.

Summary of Membership Data

The following tables were prepared using data provided by the Plan Administrator regarding its active members, retirees and former members.

These tables show the following:

D.1 A summary of the Plan membership data as at December 31, 2017 and December 31, 2014

D.2 Changes in the Plan membership

D.3 Age/Service Distribution for Active RNC Members as at December 31, 2017

D.4 Age/Service Distribution for Active Correctional Members as at December 31, 2017

D.5 Age/Service Distribution for Active Firefighters as at December 31, 2017

D.6 Age/Years since Retirement Distribution for Pensioners as at December 31, 2017

Table D.1 – Summary of Membership Data

	December 31, 2017	December 31, 2014
Active Members (Non-Firefighters)		
Number	652	634
Total salary (past year)	$51,815,358	$49,265,785
Average salary (past year)	$79,471	$77,706
Average years of service	12.0	13.0
Average age	39.3	39.6
Active Members (Firefighters)		
Number	9	18
Total salary (past year)	$1,136,739	$1,862,345
Average salary (past year)	$126,304	$103,464
Average years of service	33.7	33.0
Average age	57.8	56.8
Deferred Vested Members		
Number	14	9
Total annual pension	$196,950	$133,709
Average annual pension	$14,068	$14,857
Average age	42.1	41.1
Pending Terminations		
Number	18	22
Total pending refund	$112,227	$102,692
Average pending refund	$6,235	$4,668
Pensioners		
Number	913	852
Total annual lifetime pension	$25,076,398	$21,815,159
Average annual lifetime pension	$27,466	$25,605
Total annual bridge pension	$2,839,759	$2,800,858
Average annual bridge pension*	$7,082	$7,219
Average age	67.0	65.5

**Only reflects members who are currently in receipt of a bridge pension.*

Table D.2 – Changes in Plan Membership

	Active Members	Deferred Pensioners	Pending	Pensioners and Beneficiaries	Total
Members at December 31, 2014	**652**	**9**	**22**	**852**	**1,535**
New members	100	-	-	-	100
Returned to active employment	8	(1)	(7)	-	-
Retirements and disability pensions	(79)	-	-	79	-
Terminations:					
> Deferred pensions	(7)	7	-	-	-
> Non-vested or pending	(3)	-	3	-	-
> Fully settled (transfers/refunds)	(9)	(1)	-	-	(10)
Deaths	(1)	-	-	(42)	(43)
New survivors	-	-	-	21	21
New limited members	-	-	-	3	3
Data corrections	-	-	-	-	-
Members at December 31, 2017	**661**	**14**	**18**	**913**	**1,606**

Table D.3 – Age/Service distribution for active RNC members as at December 31, 2017

Years of service		Age									
		20-24	**25-29**	**30-34**	**35-39**	**40-44**	**45-49**	**50-54**	**55-59**	**60-64**	**Total**
0-4	**Number**	13	50	23	3	3	1				**93**
	Avg. Sal.	55,597	69,118	71,602	64,349	59,757					
5-9	**Number**		23	51	23	9	4				**110**
	Avg. Sal.		85,030	84,296	85,326	85,597	85,030				**84,798**
10-14	**Number**			19	36	26	11				**92**
	Avg. Sal.			88,342	89,848	88,235	87,349				**88,782**
15-19	**Number**				4	7	15	4	1		**31**
	Avg. Sal.				92,470	96,570	95,499	95,446			
20-24	**Number**						7	3			**10**
	Avg. Sal.						96,327	108,555			**99,995**
25-29	**Number**						5	15	3		**23**
	Avg. Sal.						104,587	103,226	97,501		**102,775**
30-34	**Number**							22	23		**45**
	Avg. Sal.							107,471	107,076		**107,270**
35-39	**Number**								5	3	**8**
	Avg. Sal.								111,394	106,288	**109,479**
Total	**Number**	**13**	**73**	**93**	**66**	**45**	**43**	**44**	**32**	**3**	**412**
	Avg. Sal.	**55,597**	**74,131**	**81,983**	**87,272**	**87,105**		**105,005**		**106,288**	**86,674**

Average age : *38.4*

Average number of years of service : *12.8*

Notes:

> *The age is computed at the nearest birthday.*

> *Years of service means the number of years of credited service in the plan.*

> *Certain figures not shown to protect confidentiality.*

Table D.4 – Age/Service distribution for active Correctional members as at December 31, 2017

Years of service		Age									
		20-24	**25-29**	**30-34**	**35-39**	**40-44**	**45-49**	**50-54**	**55-59**	**60-64**	**Total**
0-4	**Number**	1	22	16	11	8	6	2			**66**
	Avg. Sal.		60,202	62,682	64,176	65,529	64,911	61,184			
5-9	**Number**		4	20	16	17	8	6		1	**72**
	Avg. Sal.		65,310	64,841	65,931	65,993	65,099	65,099			
10-14	**Number**			2	11	14	5	3		1	**36**
	Avg. Sal.			65,099	67,626	66,147	67,652	68,779			
15-19	**Number**				2	6	16	3	1		**28**
	Avg. Sal.				71,012	72,844	66,775	80,858			
20-24	**Number**						15	9			**24**
	Avg. Sal.						74,673	73,280			**74,151**
25-29	**Number**						2	6	1		**9**
	Avg. Sal.						82,392	77,014			
30-34	**Number**							2	3		**5**
	Avg. Sal.							88,151	83,087		**85,113**
Total	**Number**	**1**	**26**	**38**	**40**	**45**	**52**	**31**	**5**	**2**	**240**
	Avg. Sal.		**60,988**	**63,945**	**66,169**	**66,872**	**69,265**	**72,896**	**79,515**	**65,099**	**67,107**

Average age : *40.7*

Average number of years of service : *10.8*

Notes:

- *The age is computed at the nearest birthday.*
- *Years of service means the number of years of credited service in the plan.*
- *Certain figures not shown to protect confidentiality.*

Table D.5 – Age/Service distribution for active Firefighters as at December 31, 2017

Years of service		Age 50-54	55-59	60-64	65+	Total
25-29	Number					
	Avg. Sal.					
30-34	Number	1	6			**7**
	Avg. Sal.		123,371			**123,595**
35-39	Number			1	1	**2**
	Avg. Sal.					**135,787**
40-44	Number					
	Avg. Sal.					
Total	**Number**	**1**	**6**	**1**	**1**	**9**
	Avg. Sal.		**123,371**			**126,304**

Average age : *57.8*

Average number of years of service : *33.7*

Notes:

> *The age is computed at the nearest birthday.*

> *Years of service means the number of years of credited service in the plan.*

> *Certain figures not shown to protect confidentiality.*

Table D.6 – Age/Years since Retirement Distribution for Pensioners as at December 31, 2017

		Years Since Retirement								
Age		**0 - 4**	**5 - 9**	**10 - 14**	**15 - 19**	**20 – 24**	**25 – 29**	**30 – 34**	**35 +**	**Total**
Under 50	**Number**	9		1						**10**
	Avg Ann Pen	36,895								
50 – 54	**Number**	39	25							**64**
	Avg Ann Pen	47,302	30,278							**40,652**
55 – 59	**Number**	80	49	28	2	1				**160**
	Avg Ann Pen	52,251	39,908	24,156	8,979					
60 – 64	**Number**	40	53	47	11	5	1			**157**
	Avg Ann Pen	53,634	42,090	27,634	16,338	9,005				
65 – 69	**Number**	7	43	47	28	31	6	3		**165**
	Avg Ann Pen	23,678	37,758	29,551	19,684	22,220	13,072	7,047		**27,380**
70 – 74	**Number**	7	2	23	20	57	48	3	1	**161**
	Avg Ann Pen	12,671	12,681	28,293	32,844	23,088	22,957	15,430		
75 – 79	**Number**	10	9	7	12	11	36	21	2	**108**
	Avg Ann Pen	10,841	15,376	12,554	25,336	28,412	25,947	17,031	18,636	**21,113**
80 – 84	**Number**	3	6	2	2	7	11	9	11	**51**
	Avg Ann Pen	13,566	14,543	14,444	14,670	16,747	27,487	19,091	13,213	**18,097**
85 – 89	**Number**	3		1	3	1	3	5	1	**17**
	Avg Ann Pen	14,216			9,447	8,491	28,642	29,666		**19,922**
90 +	**Number**	3		3	2	6		2	4	**20**
	Avg Ann Pen	6,707		7,217	7,869	8,811		38,778	9,089	**11,214**
Total	**Number**	**201**	**187**	**159**	**80**	**119**	**105**	**43**	**19**	**913**
	Avg Ann Pen	**44,620**	**36,459**	**26,266**	**22,289**	**21,430**	**23,963**	**19,134**	**12,571**	**30,530**

Notes:

> *The age is computed at the nearest birthday.*

> *Avg. Ann Pen is the annualized pension payable at January 1, 2018 (including bridge benefits).*

> *Certain figures not shown to protect confidentiality.*

Appendix E – Summary of Plan Provisions

The Uniformed Services Pension Plan for the Province of Newfoundland and Labrador (the "Plan") became effective April 1, 1967. This is a summary of the Plan provisions in effect at the valuation date and is not intended to be a complete description of benefits.

Eligibility

All full-time employees must join the Plan on their date of employment.

Contributions

At the valuation date, each member contributes to the pension fund each year a percentage of salary as follows:

> 9.95% of salary up to the Year's Basic Exemption (YBE); plus

> 8.15% of salary in excess of the YBE up to the Year's Maximum Pensionable Earnings (YMPE); plus

> 9.95% of salary in excess of the YMPE.

The Government matches member contributions and contributes any additional amounts as may be prescribed.

Retirement Dates

Normal Retirement Date: First day of the month next following the attainment of age 60 provided that the member also has at least 5 years of pensionable service.

Early Retirement Date: A member may elect to retire and to receive a pension on the first day of the month following the date on which the member has at least 25 years of pensionable service.

Disability Retirement: An member who has been credited with at least 5 years of pensionable service, has used up all sick leave entitlement and is unable to perform efficiently the duties of his or her position or those duties of an alternative position owing to an incapacity which is medically certified to the satisfaction of the minister as likely to be permanent, shall be retired on account of disability. The pension payable shall be the pension accrued by the member to the date of disability.

Retirement Benefits

The annual amount of pension payable on retirement on or after the Normal or Early Retirement Date is the sum of the following:

> Service prior to April 1, 1967: 2.0% of the average of the member's best three years' salary multiplied by the years of pensionable service prior to April 1, 1967; plus

> Service from April 1, 1967 to March 31, 1993: 2.0% of the average of the member's best three years' salary less 0.60% of the average of the YMPE in the last three years multiplied by the years of pensionable service between April 1, 1967 and March 31, 1993; plus

> Service from April 1, 1993 to March 31, 1994: 1.7% for RNC, 1.4% for Correctional Officers and 2.0% for the remaining members of the average of the member's best three years' salary less 0.60% of the average of the YMPE in the last three years multiplied by the years of pensionable service between April 1, 1993 and March 31, 1994; plus

> Service from April 1, 1994: 2.0% of the average of the member's best three years' salary less 0.60% of the average of the YMPE in the last three years multiplied by the years of pensionable service since April 1, 1994.

Indexing

There is no post-retirement indexing.

Maximum Benefit

The benefits payable from the RPP portion of the Plan to any member shall be limited by the provisions of the *Income Tax Act.*

Vesting

Members are vested after attainment of five years of pensionable service.

Termination Benefits

<u>Non Vested Member</u>: If a member terminates employment prior to becoming vested, for any reason other than retirement, disability or death, the member is entitled to receive a refund of the member's contributions with credited interest to the date of settlement.

<u>Vested Member</u>: If a member terminates employment after to becoming vested, for any reason other than retirement, disability or death, the member is entitled to

> a transfer equal to the greater of the member's contributions with credited interest or the commuted value of the member's accrued pension, or

> a deferred pension payable from the member's normal retirement date.

In the lieu of the commuted value for that period of service, a vested can "unlock" pre 1987 member contributions with interest, or if not 45+10 (age 45 with 10 years of service) pre 1997 member contributions with interest. If elected then the member must transfer their remaining entitlement out of Plan.

Death Benefits

Before Retirement

Non Vested Member: If a member dies prior to pension commencement and prior to becoming vested, the beneficiary will receive a death benefit equal to the member's contributions with credited interest to the date of settlement.

Vested Member with a Spouse: If a vested member dies prior to pension commencement the member's spouse is entitled to

- A monthly survivor pension equal to 60% of the member's accrued pension to the date of death, or
- A lump sum transfer equal to the greater of the commuted value of the member's entitlement assuming the member terminated employment on the date of death, or the commuted value of the survivor pension.

Vested Member without a Spouse: If a member dies prior to pension commencement the member's beneficiary is entitled to the commuted value of the member's entitlement assuming the member terminated employment on the date of death

After Retirement

If a pensioner has an eligible spouse, the spouse will receive 60% of the pension received by the member. If there is no surviving spouse but there are dependent children, 60% of the pension received by the member will be paid equally to each dependent child until the child reaches age 18 (or age 24 if in full-time education program).

If a pensioner has no eligible spouse or dependents the pension will cease on death of the member.

However, if the total of all pension payments made to the member (and spouse and dependent children, if applicable) is less than the member's contributions with interest at retirement then the excess will be paid to the member's beneficiary or estate.

Appendix F – Employer Certification

With respect to the actuarial valuation report of the Uniformed Services Pension Plan for the Province of Newfoundland and Labrador (the "Plan") as at December 31, 2017, we hereby confirm that to the best of our knowledge:

> the data regarding Plan members and beneficiaries provided to Morneau Shepell constitutes a complete and accurate description of the information contained in our files;

> copies of the official text of the Plan and all amendments to date were provided to Morneau Shepell;

> the amount of Plan assets as set out in Appendix C provides an accurate and complete description of the Plan's assets; and

> there are no subsequent events nor any extraordinary changes to the membership which would materially affect the results.

Province of Newfoundland and Labrador

Janice Butt

Signature

Janice Butt

Name (printed)

Director

Title

Sept 28/18

Date

About Morneau Shepell Inc.

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.

Established in 1966, Morneau Shepell serves approximately 24,000 clients, ranging from small businesses to some of the largest corporations and associations. With more than 4,500 employees in offices across North America, the United Kingdom and Australia, Morneau Shepell provides services to organizations around the globe. Morneau Shepell is a publicly-traded company on the Toronto Stock Exchange (TSX:MSI). For more information, visit morneaushepell.com.

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