Actuarial Valuation Report as at December 31, 2019

Lutheran Church - Canada Pension Plan

ASP Registration No. 00355610
CRA Registration No. 00355610

August, 2020

Ellement
Pensions | Benefits | Investments

75 Re	16 S	66 Dy	4 Be	57 La	34 Se	03 Li	01 H
105 Db	74 W	58 Ce	22 Ti	18 Ar	59 Pa	24 Cr	39 Y
50 Sn	74 Ru	10 Ca	103 Lr	66 Dy	45 Rh	82 Pb	31 Ga
47 Ag	06 C	13 Al	83 Bi	80 Hg	81 Tl	79 Au	39 V
28 Ni	07 N	32 Ge	51 Sb	78 Pt	76 Os	89 Ac	77 Ir
87 Fr	56 Ba	11 Na	73 Ta	19 K	38 Sr	55 Cs	02 He
10 Ne	08 O	54 Xe	70 Yb	100 Fm	98 Cf	97 Bk	09 F
36 Kr	92 U	94 Pu	95 Am	90 Th	101 Md	99 Es	49 In
107 Bh	64 Gd	63 Eu	69 Tm	65 Tb	17 Cl	109 Mt	48 Cd
106 Sg	92 U	94 Pu	95 Am	90 Th	101 Md	99 Es	49 In
40 Zr	64 Gd	63 Eu	69 Tm	65 Tb	17 Cl	109 Mt	48 Cd

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APPENDICES

1. ACTUARIES' OPINION

This Actuarial Valuation Report (Report) has been prepared for the Lutheran Church – Canada (Plan Sponsor) of the Lutheran Church – Canada Pension Plan (Plan) and presents the results of the valuation for funding purposes on a going concern and solvency (hypothetical wind-up) basis as at December 31, 2019 (Valuation Date). This Report recommends the required contributions to the Plan; and provides the information and the actuarial certification required by the Alberta Superintendent of Pensions (ASP) and the Canada Revenue Agency (CRA).

The Plan self-insures all benefits and therefore is exposed to investment and demographic risks, which must continue to be monitored in the future. Benefits may alternatively be purchased at an insurance carrier to eliminate a portion of these risks. This strategy may be cost effective in an appropriate economic climate and should be reviewed on an on-going basis by the Plan Sponsor.

- The value of the Plan's assets would be less than the actuarial liabilities by $15,809,762 if the Plan had been wound up on the Valuation Date (hypothetical wind-up valuation).
- The Plan has no excess surplus based on the requirements found in Section 147.2 of the Income Tax Act.
- This Report reflects an asset smoothing reserve equal to $3,529,938 on the going concern balance sheet and none on the solvency balance sheet.
- This Report reflects no contingency adjustment on the going concern and solvency balance sheets.
- Asset and liabilities have been rounded to the nearest dollar in this Report. In the Subsequent Events section of this Report, we nevertheless describe the uncertainty implicit in the actuarial calculations. Due to the limited scope of our engagement, other than interest discount sensitivity analysis discussed in Section 8, an analysis of the potential range of future measurements of the Plan's financial health due to alternative actuarial assumptions, future Plan experience, or changes in legislation was not performed, nor was it required to be performed.
- On November 28, 2018, an annuity purchase buy-out was completed with Canada Life for an amount totaling $1,399,116, of which $661,096 was paid for with Plan assets and $738,020 was paid for from the annuity buy-in contract entered in 2017. Additionally, another annuity buy-out was performed on March 21, 2019 totaling $154,360, of which 75,526 was paid for with Plan assets and $78,835 was transferred from the annuity buy-in.
- This Report does not reflect the change in the solvency interest rates after the Valuation Date, nor is it required to do so.
- The impact due to the global pandemic surrounding Covid-19 is unknown at this time. Although it appeared to have impacted the financial markets in a negative way in the first quarter, the markets partially recovered in April. The full financial and demographic impact in 2020 and moving forward remains unclear and will be monitored.
- We are not aware of any other matters or subsequent events occurring since the completion of this Report which would materially adversely affect the financial position of the Plan as at December 31, 2019.

In our opinion:

- The financial data (Appendix I) is sufficient and reliable for the purpose of the Report.
- The membership data (Appendix II) on which the Report is based are sufficient and reliable for the purpose of the Report.
- The benefits used in the calculations are based on the Plan as amended to the Valuation Date (Appendix III).
- The assumptions and methods (Appendix IV & V) are appropriate for the purpose of the Report.
- This Report has been prepared, and our opinions given, in accordance with accepted actuarial practice in Canada.

We hereby certify that, in our opinion, the assets of the Plan, together with the special contribution payments (if applicable), transfer ratio payments (if applicable), contributions in arrears with interest (if applicable), and investment income, are sufficient to provide the benefits promised by the Plan, in respect of service completed up to the Valuation Date, provided future experience is equal to or better than the experience anticipated in the actuarial assumptions. Nevertheless, emerging experience differing from the assumptions, will result in gains or losses, which will be revealed in subsequent valuations.

The opinion is this Report is subject to our understanding that ASP is aware and has granted regulatory forbearance such that the solvency payments for the Plan have not been remitted to date and are not required to be remitted by the Plan although no formal solvency exemption exists.

This Report is subject to approval by the ASP and CRA. It is required that the next actuarial valuation report occur no later than December 31, 2022.

Respectfully submitted,

ELLEMENT CONSULTING GROUP

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May 29, 2020

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May 29, 2020

2. EXECUTIVE SUMMARY

This Report has been prepared for the Plan as at December 31, 2019 for the primary purpose of establishing the funding recommendation for the Plan until the next such valuation is performed. The table below provides a summary of the results of this Report but is not intended to replace the detailed information presented in the Report. The results have been prepared as at December 31, 2019, with comparative results as at December 31, 2017.

Going Concern Valuation	**31-Dec-2019**	**31-Dec-2017**
Market Value of Assets	$ 85,420,982	$ 78,874,768
Accounts Receivable/(Payable)	(37,390)	407,014
Actuarial Liability	(79,330,233)	(76,405,948)
Surplus/(Unfunded Liability) Before Adjustments	$ 6,053,359	$ 2,875,834
Asset Smoothing Adjustment	(3,529,938)	(2,712,980)
Contingency Adjustment	-	-
Surplus/(Unfunded Liability) After Adjustments	$ 2,523,421	$ 162,854
Funded Ratio Before Adjustments	107.6%	103.8%
Funded Ratio After Adjustments	103.2%	100.2%

Solvency Valuation	**31-Dec-2019**	**31-Dec-2017**
Market Value of Assets	$ 85,420,982	$ 78,874,768
Accounts Receivable/(Payable)	(37,390)	407,014
Estimated Wind-Up Expenses	(250,000)	(250,000)
Solvency Liability	(100,943,354)	(98,740,841)
Hypothetical Wind-Up Excess/(Deficiency)	$ (15,809,762)	$ (19,709,059)
Solvency Ratio	84.3%	80.0%

Annual Contribution Requirements	**% DB Salary**	**2020 Expected**	**% DB Salary**	**2019 Actual**
Defined Benefit Plan				
Employers Contributions		$ 1,992,792		$ 2,344,520
Employee Contributions		47,575		50,525
Total Contributions **[A]**		$ 2,040,367		$ 2,395,045
Normal Actuarial Cost	17.0%	(202,194)	16.3%	(206,106)
Special Payments: Going Concern		-		-
Special Payments: Solvency [1]		(3,385,269)		(4,230,237)
Transfer Ratio Payments		(105,027)		(149,710)
Contributions in Arrears with Interest		-		-
Total Annual Contribution Requirements **[B]**		(307,221)		(355,816)
Contribution Margin/(Deficiency) (**[A]** + **[B]**)		$ 1,733,146		$ 2,039,229
Defined Contribution Plan	**% DC Salary**		**% DC Salary**	
Employers Contributions	6.0%	$ 1,149,906	6.0%	$ 1,113,065
Employee Contributions	4.0%	766,604	5.2%	973,192
		$ 1,916,510		$ 2,086,257
Total Contributions (DB + DC)	**% Total Salary**		**% Total Salary**	
Employers Contributions	15.4%	$ 3,142,698	17.4%	$ 3,457,585
Employee Contributions	4.0%	814,179	5.1%	1,023,717
		$ 3,956,877		$ 4,481,302
Total Estimated/Actual Employee Payroll				
DB Member Payroll		$ 1,189,376		$ 1,264,451
DB / DC Member Salaries		12,528,536		12,193,222
DC Member Payroll		5,496,382		5,349,277
NALC Payroll [2]		1,140,189		1,109,673
		$ 20,354,483		$ 19,916,623

[1] The opinion in this Report is subject to our understanding that ASP is aware and has granted regulatory forbearance such that the solvency payments for the Plan have not been remitted to date and are not required to be remitted by the Plan although no formal solvency exemption exists.

[2] NALC salaries are not included in the expected payments for the Defined Benefit Plan.

[3] Lump sum termination payments must be topped up 15.7%.

3. GOING CONCERN VALUATION

The going concern valuation provides an assessment of the Plan's financial position at the Valuation Date on the premise that the Plan continues into the future indefinitely. On the basis of the asset information, membership data, going concern assumptions and methods and Plan provisions described in the Appendices, the going concern financial position of the Plan as at the Valuation Date is shown in the following table. Amounts have been rounded to the nearest dollar.

	31-Dec-2019		31-Dec-2017	
ASSETS	$	% of Liabilities	$	% of Liabilities
Market Value of Assets	$ 66,396,985		$ 57,357,823	
Annuity Buy-In	19,023,997		21,516,945	
Accounts Receivable/(Payable)	(37,390)		407,014	
Total Assets	$ 85,383,592	107.6%	$ 79,281,782	103.8%
LIABILITIES*				
Actives (2019: 195 / 2017: 252)				
- Active-R	$ 18,379,054	23.2%	$ 21,135,945	27.7%
- Active	6,279,282	7.9%	7,853,668	10.3%
- Disabled-R	932,466	1.2%	939,686	1.2%
- Disabled	116,070	0.1%	140,926	0.2%
	$ 25,706,872	32.4%	$ 30,070,225	39.4%
Deferreds et al (2019: 252 / 2017: 254)				
- Deferred-R	$ 5,741,809	7.2%	$ 5,430,331	7.1%
- Deferred	2,399,277	3.0%	1,913,250	2.5%
- US-R	2,760,066	3.5%	2,758,633	3.6%
- US	227,634	0.3%	324,543	0.4%
	$ 11,128,786	14.0%	$ 10,426,757	13.6%
Pensioners et al (2019: 386 / 2017: 379)				
- Pensioner-R	$ 22,202,948	28.0%	$ 17,473,851	22.9%
- Survivor-R	1,267,630	1.6%	1,316,441	1.7%
- Pensioner-R (Annuity Buy-In)	17,470,947	22.0%	15,802,233	0.21
- Survivor-R (Annuity Buy-In)	1,553,050	2.0%	1,316,441	0.02
	$ 42,494,575	53.6%	$ 35,908,966	47.0%
Total Liabilities (2019: 833 / 2017: 885)	$ 79,330,233	100.0%	$ 76,405,948	100.0%
Surplus/(Unfunded Liability) Before Adjustments	$ 6,053,359		$ 2,875,834	
Asset Smoothing Adjustment	(3,529,938)		(2,712,980)	
Contingency Adjustment	-		-	
Surplus/(Unfunded Liability) After Adjustments	$ 2,523,421		$ 162,854	
Funded Ratio Before Adjustments	107.6%		103.8%	
Funded Ratio After Adjustments	103.2%		100.2%	

* Please note that the "-R" refers to those members that are within the retirement window.

Liability % for those members that are retired or eligible to retire		88.7%		86.6%
Liability % for those members that are <u>not</u> retired or eligible to retire		11.3%		13.4%

Going Concern	Number of Years Remaining	Annual Payment	31-Dec-2019 Unamortized	31-Dec-2017 Unamortized
Normal Actuarial Cost	-	$ 202,194	$ -	$ -
Unfunded Liability 31-Dec-2017	-	-	-	-
Unfunded Liability 31-Dec-2019	-	-	-	-
Solvency Deficiency 31-Dec-2017	-	-	-	-
Solvency Deficiency 31-Dec-2019	-	-	-	-
Transfer Ratio Payments	-	105,027	-	-
Contributions in Arrears with Interest	-	-	-	-
Total 31-Dec-2019		$ 307,221	$ -	$ -

4. SOLVENCY / HYPOTHETICAL WIND-UP VALUATION

The solvency valuation is a financial assessment of the Plan that is required under the Employees' Pension Plans Act (EPPA) of Alberta and is performed in accordance with requirements prescribed by this Act. It is intended to provide an assessment of the Plan's financial position assuming a plan termination basis. The standards of practice of the Canadian Institute of Actuaries also requires that a valuation be prepared on a plan termination basis. This valuation is referred to as a hypothetical wind-up valuation.

On the basis of the asset information, membership data, solvency assumptions and methods and Plan provisions described in the Appendices, as well as the requirements of the EPPA, the solvency financial position of the Plan as at the Valuation Date is shown in the following table. Amounts shown have been rounded to the nearest dollar.

	31-Dec-2019		31-Dec-2017	
ASSETS	$	% of Liabilities	$	% of Liabilities
Market Value of Assets	$ 66,396,985		$ 57,357,823	
Annuity Buy-In	19,023,997		21,516,945	
Accounts Receivable/(Payable)	(37,390)		407,014	
Estimated Wind-Up Expenses	(250,000)		(250,000)	
Total Assets	$ 85,133,592	84.3%	$ 79,031,782	80.0%
LIABILITIES*				
Actives (2019: 195 / 2017: 252)				
- Active-R	$ 23,403,948	23.2%	$ 26,233,536	26.6%
- Active	10,089,355	10.0%	10,756,399	10.9%
- Disabled-R	1,107,341	1.1%	1,206,840	1.2%
- Disabled	189,075	0.2%	183,858	0.2%
	$ 34,789,719	34.5%	$ 38,380,633	38.9%
Deferreds et al (2019: 252 / 2017: 254)				
- Deferred-R	$ 7,725,878	7.7%	$ 7,308,572	7.4%
- Deferred	5,450,043	5.4%	3,808,547	3.9%
- US-R	3,475,056	3.4%	3,479,230	3.5%
- US	398,669	0.4%	480,910	0.5%
	$ 17,049,646	16.9%	$ 15,077,259	15.3%
Pensioners et al (2019: 386 / 2017: 379)				
- Pensioner-R	$ 28,526,942	28.3%	$ 22,151,484	22.4%
- Survivor-R	1,553,050	1.5%	1,614,520	1.6%
- Pensioner-R (Annuity Buy-In)	17,470,947	17.3%	19,902,425	20.2%
- Survivor-R (Annuity Buy-In)	1,553,050	1.5%	1,614,520	1.6%
	$ 49,103,989	48.6%	$ 45,282,949	45.8%
Total Liabilities (2019: 833 / 2017: 885)	$ 100,943,354	100.0%	$ 98,740,841	100.0%
Hypothetical Wind-Up Excess/(Deficiency)	$ (15,809,762)		$ (19,709,059)	
Solvency Ratio	84.3%		80.0%	
* Please note that the "-R" refers to those members that are within the retirement window.				
Liability % for those members that are retired or eligible to retire		84.0%		84.5%
Liability % for those members that are <u>not</u> retired or eligible to retire		16.0%		15.5%

Solvency	Number of Years Remaining	Annual Payment	31-Dec-2019 Unamortized	31-Dec-2017 Unamortized
Normal Actuarial Cost	-	$ 202,194	$ -	$ -
Unfunded Liability 31-Dec-2017	-	-	-	-
Unfunded Liability 31-Dec-2019	-	-	-	-
Solvency Deficiency 31-Dec-2017	-	-	-	19,709,059
Solvency Deficiency 31-Dec-2019[1]	5.00	3,385,269	15,809,762	-
Transfer Ratio Payments	-	105,027	-	-
Contributions in Arrears with Interest	-	-	-	-
Total 31-Dec-2019		$ 307,221	$ 15,809,762	$ 19,709,059

[1] The opinion in this Report is subject to our understanding that ASP is aware and has granted regulatory forbearance such that the solvency payments for the Plan have not been remitted to date and are not required to be remitted by the Plan although no formal solvency exemption exists.

5. ANALYSIS OF RESULTS – GOING CONCERN

Cash Flow Gain/(Loss) Analysis		Financial Position		
		Assets	Liabilities	Surplus/ (Unfunded)
Going Concern Position 31-Dec-2017 (Report)		$ 76,568,802	$ 76,405,948	$ 162,854
Adjustments	- Asset Smoothing Adjustment: Removed	2,712,980	-	2,712,980
Going Concern Position 31-Dec-2017 (Preliminary)		$ 79,281,782	$ 76,405,948	$ 2,875,834
Contributions	- Employee Contributions	113,285	113,285	-
	- Employers Contributions Normal Cost	358,768	358,768	-
	- Required Special Payments: Going Concern	-	-	-
	- Additional Employers Contributions	5,388,255	-	5,388,255
Gross Investment Income	- Gross Expected Interest	9,473,405	9,041,884	431,521
	- Gross Investment Gain/(Loss)	2,108,268	-	2,108,268
Benefits	- Pensions (Retirement Experience)	(7,181,228)	(7,314,699)	133,471
	- Commuted Value Lump sums (Termination Experience)	(1,341,339)	(1,160,289)	(181,050)
	- Annuity Buy-out	(1,553,476)	(1,192,913)	(360,563)
	- Mortality Experience	-	341,026	(341,026)
	- Salary Experience (Salary / YMPE / Maximum Pension)	-	(250,321)	250,321
Expenses	- Operating Expenses	(733,052)	(576,329)	(156,723)
	- Investment Expenses	(531,076)	(493,996)	(37,080)
Methodology et al	- Data, Methodology, et al	-	227,811	(227,811)
Going Concern Position 31-Dec-2019 (Preliminary)		$ 85,383,592	$ 75,500,175	$ 9,883,417
Actuarial	- Methodology: Change in Annuity Buy-In Value	-	3,830,058	(3,830,058)
	- Salary Scale: no change	-	-	-
	- YMPE and ITA: no change	-	-	-
	- Interest Rate: no change	-	-	-
Going Concern Position 31-Dec-2019 (Before Adjustments)		$ 85,383,592	$ 79,330,233	$ 6,053,359
Adjustments	- Asset Smoothing Adjustment: Re-Established	(3,529,938)	-	(3,529,938)
Going Concern Position 31-Dec-2019 (After Adjustments)		$ 81,853,654	$ 79,330,233	$ 2,523,421

The retirement pensions in 2019, equal to $3,644,114, was compared to the membership records received (see Appendix II – Page 2: $3,682,440 = 12 x [386 x $795]) and found to be reasonable given the timing of retirements and deaths during the year.

6. CONTRIBUTUION REQUIREMENTS

Normal Cost

The defined benefit normal cost means the amount estimated, on the basis of a going concern valuation and using the methods and assumptions that are used to determine going concern liabilities, to be the cost of benefits under a plan's defined benefit provision for a fiscal year. The estimated normal cost rule is developed in the table below:

		2020
Total Normal Cost		202,194
Employee Contributions		47,575
Employers Normal Cost		154,619
Estimated Employee Defined Benefit Payroll	$	1,189,376
Employers Normal Cost as a % of Employee Payroll		13.0%

Special Payments – Going Concern and Solvency

There is a requirement to fund any going concern unfunded liability as determined based on legislation and regulations in Alberta. There are no going concern special payments as the Plan is in a surplus position. As the Plan has been granted regulatory forbearance on solvency funding requirements, no solvency funding is required.

Transfer Ratio Payments

The amount of any solvency deficiency payments related to a solvency ratio of less than one in respect of lump sum settlements is known as transfer ratio payments. There is a requirement to top up lump sum termination payments by 15.7%. This is estimated to be 105,027 in 2020.

Contributions in Arrears with Interest

Contributions with interest not paid in previous years are due immediately. No contribution in arrears with interest are included in this year's minimum required contribution.

Minimum Contribution

The minimum contribution is equal to the normal cost plus any contributions in arrears with interest, transfer ratio payments, and going concern and solvency special payments. The minimum contribution for the purposes of this Report is estimated to be $259,646 in 2020.

Maximum Contribution

The maximum contribution in any year is equal to the normal cost plus the greater of the going concern deficiency and the solvency deficiency minus the required use of any excess surplus. The maximum contribution is equal to $15,964,381.

Maximum Permitted Surplus

The maximum permitted actuarial surplus under Section 147.2 of the Income Tax Act is now equal to 25% of the going concern actuarial liabilities, or $19,832,558 In addition, paragraph 147.2(2)(c) allows recognition of off balance sheet liabilities for cost-of-living and other adjustments, which are reasonably expected to occur in the future. Thus, there is no offside surplus at this time.

7. ANALYSIS OF RESULTS - SOLVENCY

The solvency valuation interest rate assumption for annuity purchases has decreased 0.07% from 3.02% to 2.95%. The solvency valuation less than 10-year interest rate assumption for cash settlements has decreased by 0.20% from 2.60% to 2.40%, while the greater than 10-year rate has decreased by 0.90% from 3.40% to 2.50%. This has resulted in an overall blended decrease in the interest rates used for the solvency valuation causing a 3.09% increase in liabilities equal to $3,119,404.

Pursuant to the Standards of the Canadian Institute of Actuaries (CIA) it is now required to disclose the incremental cost in the next three years on a hypothetical wind-up/solvency basis. This cost is equal to $1,086,000 as at December 31, 2019.

The incremental cost on a solvency basis represents the present value at the Valuation Date of the expected aggregate change in the solvency liability between December 31, 2019 and December 31, 2022, adjusted upwards for expected benefit payments during this period.

The solvency incremental cost reflects expected decrements and related changes in membership status, accrual of service, expected changes in benefits, and a projection of pensionable earnings based on the going concern assumptions summarized in Appendix IV. The projection of the solvency liability to December 31, 2022 assumes that no new members enter the Plan for the purposes of determining the incremental cost.

8. SENSITIVITY TEST (DURATION)

The impact on pension liabilities of changes in the actuarial assumptions depends largely upon the number of years over which benefits will be paid and the exact pattern of the expected benefits cash flow.

The demographics of the group covered by a valuation basis have an impact on the resulting change in liability for a given change in an actuarial assumption.

Different parts of the valuation are affected differently by a change in a specific valuation assumption. One of the more significant assumptions is the assumed rate of return.

There are rules of thumb to estimate the effect upon liabilities of a change in the assumed rate of return. These rules of thumb can be expressed mathematically by introducing the concept of duration where:

% change in liability = - duration x % change in assumed rate

The approximation is usually quite good for small changes in the assumed rate (we will test a negative 1% change – the "Estimated Duration" shown below is the effect of a 1% decrease in the assumed rate of return).

The following table summarizes the application of the above formula to the Plan data as at December 31, 2019.

		Sensitivity of a Decrease in the Assumed Rate of Return			
Going Concern Liability Category	**5.50% Liability**	**4.50% Liability**	**$ Change in Liability**	**% Change in Liability**	**Estimated Duration**
Actives & Disableds	$ 25,706,872	$ 30,023,216	$ 4,316,344	16.8%	16.8
Deferreds et al	11,128,786	12,955,910	1,827,124	16.4%	16.4
Pensioners et al	42,494,575	46,475,170	3,980,595	9.4%	9.4
Total	$ 79,330,233	$ 89,454,296	$ 10,124,063	12.8%	12.8

		Sensitivity of a Decrease in the Assumed Rate of Return			
Normal Cost	**5.50% Normal Cost**	**4.50% Normal Cost**	**$ Change in Normal Cost**	**% Change in Normal Cost**	**Estimated Duration**
Total	$ 202,194	$ 227,171	24,977	12.4%	12.4

		Sensitivity of a Decrease in the Assumed Rate of Return			
Solvency Liability Category	**2.40%/2.50%/2.95% Liability**	**1.40%/1.50%/1.95% Liability**	**$ Change in Liability**	**% Change in Liability**	**Estimated Duration**
Actives & Disableds	$ 34,789,719	$ 41,519,561	$ 6,729,842	19.3%	19.3
Deferreds et al	17,049,646	20,588,126	3,538,480	20.8%	20.8
Pensioners et al	49,103,989	54,180,785	5,076,796	10.3%	10.3
Total	$ 100,943,354	$ 116,288,472	$ 15,345,118	15.2%	15.2

The higher the duration, the more sensitive the financial position of the Plan is to a change in actuarial assumptions.

Active participant liabilities are generally more sensitive (volatile) to a change in the assumed rates than other participants. Pensions in payment liabilities are the least sensitive.

A 1% decrease in the going concern assumed rate of return would result in a 12.8% increase in the going concern liability and a 12.4% increase in the 2020 normal actuarial cost.

9. MARGIN FOR ADVERSE DEVIATIONS (MfADs)

MfAD = Margin for Adverse Deviation – the difference between the assumption for a calculation and the corresponding best estimate assumption.

PfAD = Provision for Adverse Deviation – the $ value of the MfAD calculated as the difference between the results based on the assumptions and the corresponding results based on the best estimate assumption.

The actuarial assumptions must be, individually and in aggregate, appropriate for the purpose of the valuation. The assumptions are the sum of the actuarial best estimate plus a MfAD. Best estimates are developed by the actuary; however, it is the responsibility of the Lutheran Church – Canada Board of Directors (Administrator) to determine the extent of any MfADs.

Pension plan funding has a main goal of security of benefits for the Plan participants. Funding may also have the goal of achieving stable benefit levels or contributions over time. A variable Provision for Adverse Deviation (PfAD) (e.g. as a percentage of actuarial liabilities), one that increases or decreases as Plan experience is favourable or unfavourable, respectively, can enhance the stability of the plan benefits and contributions.

A PfAD in the going concern valuation alone, while enhancing benefit security, would not necessarily be sufficient to ensure that all accrued benefits could be covered where the Plan is actually to wind-up, hence a PfAD may also be developed on the solvency balance sheet as the opportunity permits. In choosing an appropriate PfAD the Committee must examine several factors, including:

- The financial strength of the employers (less financial ability and willingness then more PfAD);
- The uncertainty of future Plan experience (more uncertainty, more PfAD);
- The appropriate time horizon for consideration (1 year, 3 years, etc., longer outlooks increase the PfAD);
- The maturity of the Plan liabilities (more retirees may require a larger PfAD);
- The asset mix of the Plan (more equity requires a larger PfAD).

Individual MfADs

Each actuarial assumption developed in Appendix IV and V may simply be a best estimate with no MfAD or may have an MfAD implicitly imbedded. The most notable is in the development of the assumed rate of return. There is a possible 0.04% MfAD present in the assumed rate of return of 5.50% (please refer to Appendix IV, page 4 for further detail). The magnitude of this PfAD for the going concern balance sheet can be calculated from the duration shown on page 8 to be about $406,171 (0.04% x 12.8 x $79,330,233) or a PfAD equal to 0.50% of going concern liabilities. The nature of the solvency balance sheet, being a hypothetical windup, does not permit making a similar statement.

Contribution Margin

Before any special payments for deficits, if the expected employee and employer contributions exceed the normal actuarial cost, present value of these "unallocated" contributions represent the contribution margin. The current valuation indicates an expected going concern contribution margin equal to $1,733,146 after reflecting the going concern special payments. The contribution margin is nil after reflecting solvency special payments.

Contingency Adjustment

There is no contingency adjustment on the going concern and solvency balance sheets.

10. ADDITIONAL COMMENTARY AND SUBSEQUENT EVENTS

- This Report does not reflect the change in the going concern or solvency test discount rates after the Valuation Date, nor is it required. An actuarial valuation report is a snapshot of a plan's estimated financial condition at a particular point in time; it does not predict the pension plan's future financial condition or its ability to pay benefits in the future.

  Over time, the Plan's actual cost will depend on a number of factors, including the level of the benefits in the Plan, the number of individuals paid benefits, the amount of Plan expenses, and the amount earned on any assets invested to pay the benefits. These amounts and other variables are uncertain and unknowable at the Valuation Date.

  To prepare this Report, actuarial assumptions, as described in Appendices IV and V, are used to select a single scenario from the range of possibilities. The results of that single scenario are included in this Report. However, the future is uncertain, and the Plan's actual experience will differ from those assumptions; these differences may be significant or material. In addition, different assumptions or scenarios may also be within the reasonable range and results based on those assumptions would be different. Actuarial assumptions may also be changed from one valuation to the next because of changes in regulatory requirements, plan experience, changes in expectations about the future and other factors.

  Because actual Plan experience will differ from the assumptions, decisions about benefit changes, investment policy, funding amounts, benefit security and/or benefit-related issues should be made only after careful consideration of alternative future financial conditions and scenarios, and not solely on the basis of an actuarial valuation report or reports.

- Solvency Ratio Impact: The Employment Pension Plans Act (Regulations) of Alberta states:

  "Where a plan has solvency ratio of less than 1, a transfer shall be considered to impair the solvency of the plan, but the Administrator may make the transfer where:

  (a) the employers have remitted sufficient money to the plan the eliminate any transfer deficiency relating to the transfer, or

  (b) the transfer deficiency for any person is less than 5% of the Year's Maximum Pensionable Earnings (YMPE) for the year in which the transfer is made and the total of all such transfer deficiencies since the last review date does not exceed 5% of the market value of the assets of the plan at the time of transfer, or

  (c) the transfer is an amount equal to the commuted value of a benefit less the transfer deficiency related to the benefit."

  Any amount withheld must be paid to the individual within 5 years from the date of initial transfer. This hold back amount need not be made if the Administrator can demonstrate that the margin in the contributions is adequate for this purpose.

  This Solvency Ratio is subject to the approval of the Superintendent of Pensions.

- The opinion in this Report is subject to our understanding that ASP is aware and has granted regulatory forbearance such that the solvency payments for the Plan have not been remitted to date and are not required to be remitted by the Plan although no formal solvency exemption exists.

- We are not aware of any other matters or subsequent events occurring since the completion of this Report which would materially adversely affect the financial position of the Plan as at December 31, 2019.

APPENDIX I

Asset Data

We have relied on the audited financial statements prepared by KPMG, and provided to us by management at the Lutheran Church – Canada. We have performed a reconciliation of the assets year-over-year and compared the actual cash flows to the expected.

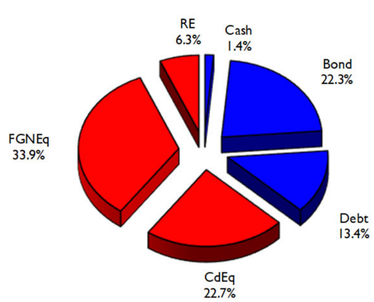
Asset Class Mix

A breakdown of the market value of the assets of the Plan using the audited custodial statements is shown below. The Investment Policy reflects the new mix adopted by the Board of Directors on March 23, 2018.

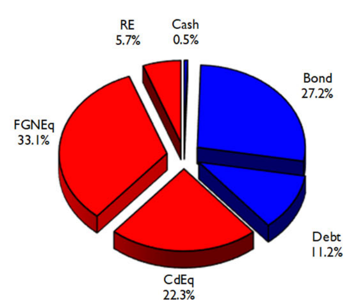
Asset Class Mix		31-Dec-2019		31-Dec-2017		Investment Policy	
		Market Value	%	Market Value	%	Range	Target
	Transaction Account	$ -	-	$ -	0.0%		
1	Cash & Net Assets (Cash)	1,229,527	1.4%	407,014	0.5%	0-10%	2.00%
2	Fixed Income (Bond) *	19,023,997	22.3%	21,583,405	27.2%	0-45%	23.00%
	Private Debt (Debt)	11,478,266	13.4%	8,883,000	11.2%	0-20%	15.00%
	Total Fixed Income	$ 31,731,790	37.1%	$ 30,873,419	38.9%		
3	Canadian Equities (CdEq)	19,402,764	22.7%	17,649,103	22.3%	15-30%	20.00%
4	Foreign Equities (FGNEq)	28,907,544	33.9%	26,235,153	33.1%	20-40%	30.00%
5	Real Estate (RE)	5,341,494	6.3%	4,524,107	5.7%	0-15%	10.00%
	Total Equity	$ 53,651,802	62.9%	$ 48,408,363	61.1%		
	Total Market Value	$ 85,383,592	100.0%	$ 79,281,782	100.0%		

* Fixed Income includes the Annuity Buy-In equal to $19,023,997.

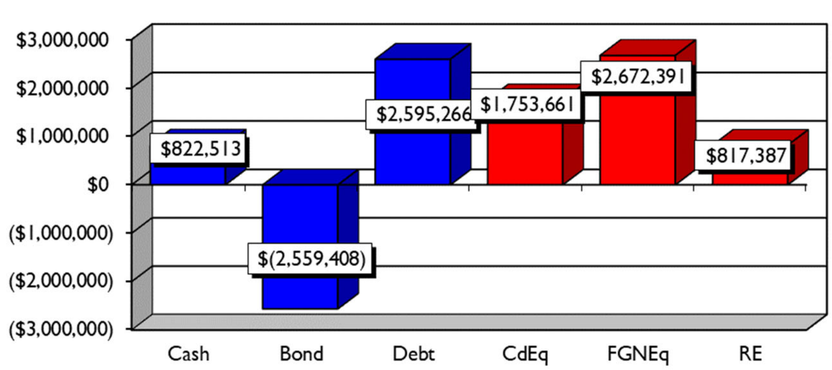
31-Dec-2019
(62.9% Equity)



31-Dec-2017
(61.1% Equity)



Change in Asset Class Holdings Since Previous Valuation



Historical Cash Flow

Year	Opening Market Value	Transfer Out	Contributions Employee	Contributions Employers	Investment Income	Benefits Pensions	Benefits Lump Sums	Expenses Operating	Expenses Investment	Closing Market Value	Gross Return	Net Return
2012	73,669,697		-	5,466,914	7,191,274	(3,529,302)	(624,671)	(517,997)	(179,778)	81,476,137	9.72%	8.74%
2013	81,476,137		198,248	2,725,764	12,526,054	(3,850,020)	(697,588)	(361,032)	(281,443)	91,736,120	15.59%	14.73%
2014	91,736,120		207,601	2,712,656	9,018,234	(4,258,499)	(738,472)	(269,533)	(343,358)	98,064,749	9.98%	9.27%
2015	98,064,749	(30,425,177) [1]	89,708	1,779,136	4,989,263	(4,600,475)	(243,195)	(278,017)	(404,492)	68,971,500	6.16%	5.29%
2016	68,971,500	(110,171) [2]	77,116	3,481,624	6,003,485	(3,893,946)	(315,583)	(296,057)	(269,729)	73,648,239	8.79%	7.93%
2017	73,648,239		74,470	3,089,661	6,696,277	(3,351,711)	(358,372)	(273,388)	(243,394)	79,281,782	9.16%	8.42%
2018	79,281,782	(1,399,116) [3]	62,760	3,402,503	617,921	(3,537,114)	(591,289)	(382,824)	(261,155)	77,193,468	0.79%	(0.03%)
2019	77,193,468	(154,360) [3]	50,525	2,344,520	10,963,752	(3,644,114)	(750,050)	(350,228)	(269,921)	85,383,592	14.46%	13.59%
			$ 760,428	$ 25,002,778	$ 58,006,260	$ (30,665,181)	$ (4,319,220)	$ (2,729,076)	$ (2,253,270)	"8-Year Average"	9.24%	8.41%
										"6-Year Average"	8.14%	7.33%
										"3-Year Average"	7.99%	7.18%

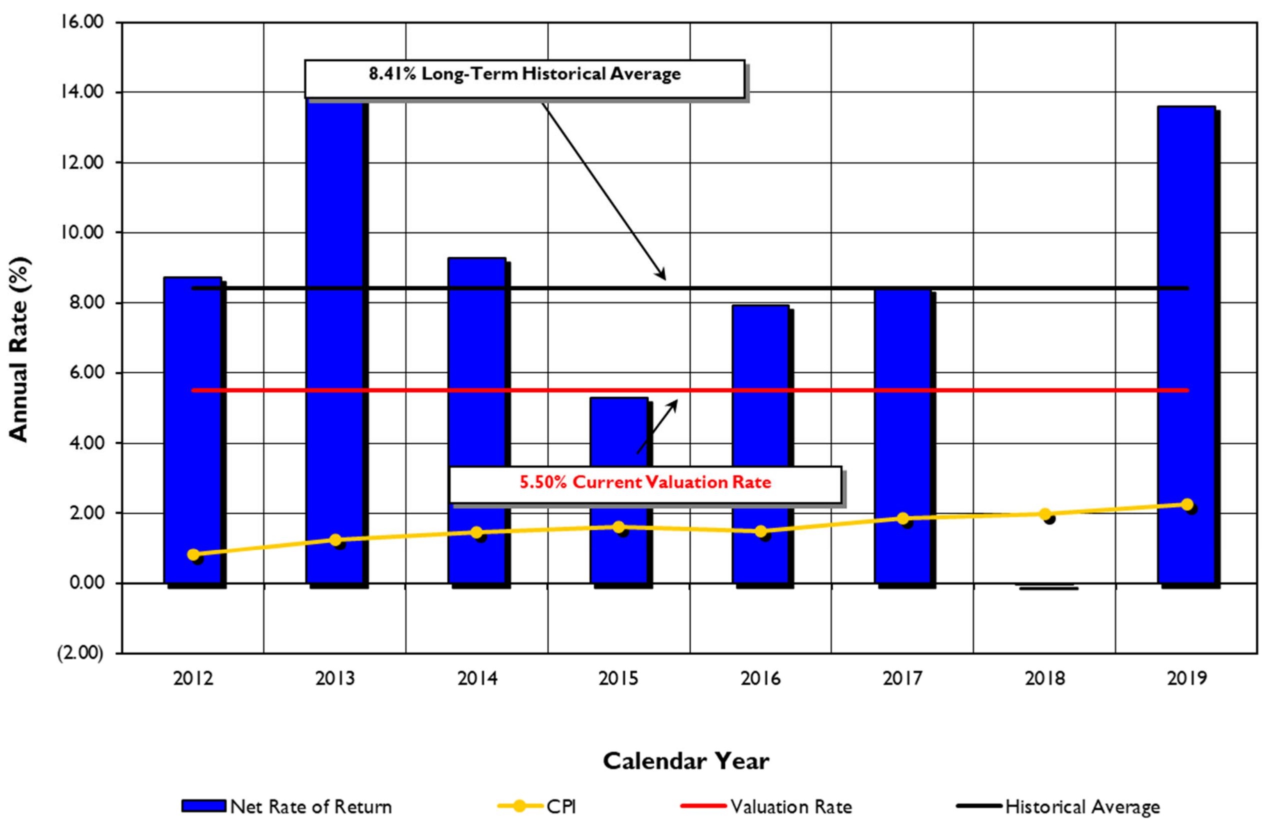
[1] Concordia University of Edmonton withdrew as a participating employer in the Plan. The Pension Transfer Agreement between Concordia and LCC was equal to $30,425,177

[2] Payable to Concordia University of Edmonton

[3] Annuity Buy-out transfer to Canada Life

Net Return = Gross Return net of both Operating and Investment expenses.
Dollar-weighted rates of return were calculated on the basis of mid-year cash flow; geometric averages.
Time-weighted returns may vary.

Historical Rates of Return (ROR) and Inflation (CPI)



APPENDIX II

Membership Data

This Report and the membership data used to calculate employee benefits and consequently, the going concern and solvency liabilities reflects the employee salary rates in effect on December 31, 2019.

The data used in the development of this Report was provided by the employers of Lutheran Church - Canada. Internal consistency checks were performed on the data to ensure reasonableness. The Plan Text was reviewed to ensure that the data provided was appropriate for the purposes of the Actuarial Valuation Report.

A membership reconciliation was performed on the current valuation data and the data provided at the last valuation. The following fields were compared to the previous valuation data to ensure consistency:

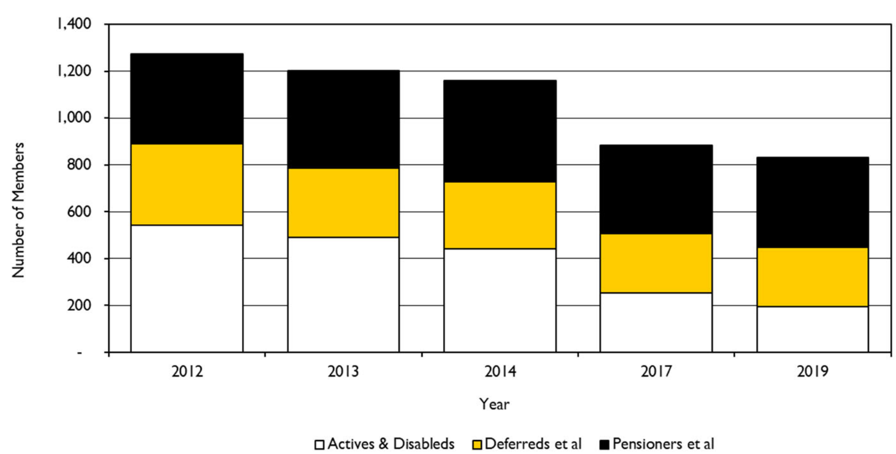
- date of birth;
- date of hire;
- date of enrollment;
- date of termination;
- date of retirement;
- spouse date of birth; and
- gender.

Further data analysis was conducted on service and salary fields, ensuring that the values can be reconciled and are reasonable. All pensions in payment will be checked against the custodial and financial statements for consistency and compared against amounts communicated in previous valuations.

In the event that data is missing or contains limitations, the actuary may use reasonable adjustments and assumptions to perform the required valuations. After review, no data is missing and the data does not contain any material defects. This Report does not make use of any data adjustments or assumptions and is reasonable and appropriate for the purposes of the valuation.

Historical Membership

Year	*Actives & Disableds*	*Deferreds et al*	*Pensioners et al*	*Total*
2012	544	345	386	1,275
2013	492	296	416	1,204
2014	443	285	432	1,160
2017	252	254	379	885
2019	195	252	386	833



Membership Reconciliation

		Actives et al		*Deferreds et al*		*Pensioners et al*		
		Active	*Disabled*	*US*	*Deferred*	*Pensioner*	*Survivor*	*Total*
Membership as at 31-Dec-2017		244	8	52	202	316	63	885
Adjustments		(1)	-	-	(1)	2	(2)	(2)
New Entrants		-	-	-	-	-	-	-
Return to work		-	-	-	-	-	-	-
Disabled		(1)	1	-	-	-	-	-
Retirements	- cash refund	-	-	-	-	-	-	-
	- pension	(18)	(1)	(7)	(10)	36	-	-
Terminations	- transferred/cash refund	(10)	-	-	(10)	-	-	(20)
	- vested	(24)	(1)	(6)	31	-	-	-
	- US transfer	(2)	-	2	-	-	-	-
	- Annuity Buy-out	-	-	-	-	(16)	(2)	(18)
Deaths	- no benefit remaining	-	-	-	(1)	(7)	(4)	(12)
	- pension to survivor	-	-	-	-	(8)	8	-
Membership as at 31-Dec-2019		188	7	41	211	323	63	833

Membership Data

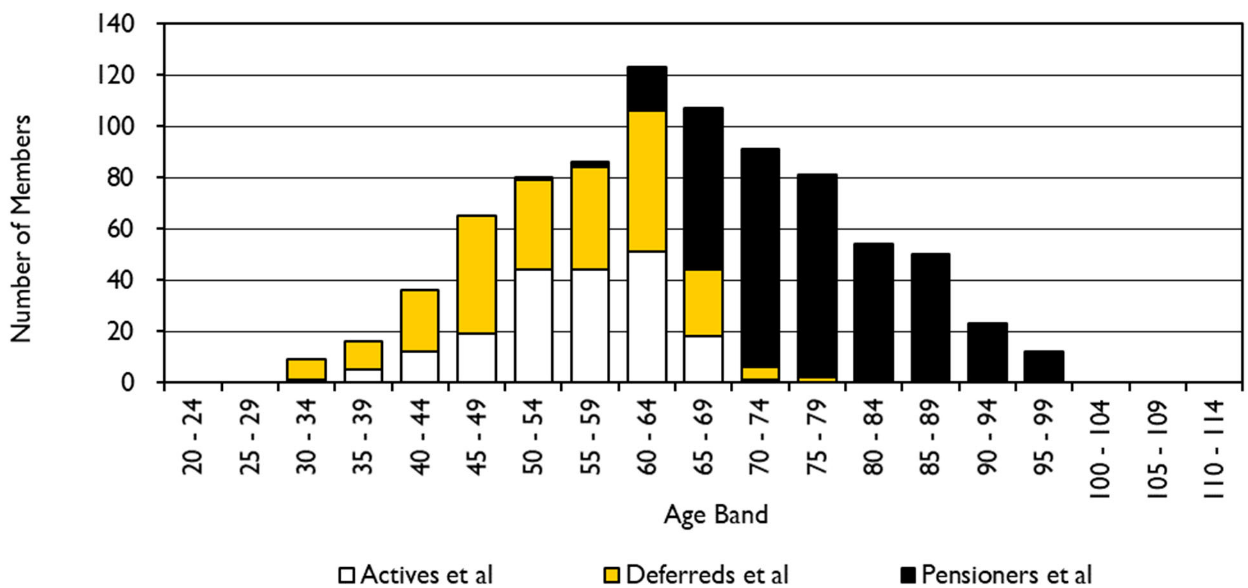
	31-Dec-2019			**31-Dec-2017**		
	Number	***Average Age***	***Average Monthly Pension***	***Number***	***Average Age***	***Average Monthly Pension***
Actives						
- Active-R	107	60.8	$ 1,568	127	60.2	$ 1,632
- Active	81	48.6	767	117	47.0	688
- Disabled-R	4	60.5	1,634	4	60.0	1,658
- Disabled	3	45.3	437	4	44.8	402
	195	55.5	$ 1,219	252	53.8	$ 1,175
Deferreds et al						
- US-R	32	61.4	$ 613	41	60.5	$ 491
- US	9	47.7	268	11	46.2	332
- Deferred-R	90	62.7	459	86	61.4	483
- Deferred	121	46.0	294	116	44.3	267
	252	54.0	$ 393	254	52.8	$ 379
Pensioners et al						
- Pensioner-R	323	76.1	$ 869	316	75.6	$ 819
- Survivor-R	63	81.3	417	63	80.0	412
	386	77.0	$ 795	379	76.3	$ 751
Total	833	65.0	$ 773	885	63.2	$ 765

Plan Year Profile

	Actives et al at 31-Dec-2019							
	Plan Years							
Age Band	0 - 4	5 - 9	10 - 14	15 - 19	20 - 24	25 - 29	> 30	Total
20 - 24	-	-	-	-	-	-	-	-
25 - 29	-	-						-
30 - 34	1	-	-					1
35 - 39	4	1	-					5
40 - 44	4	8	-	-	-			12
45 - 49	1	10	8	-	-	-		19
50 - 54	5	9	16	12	2	-	-	44
55 - 59	4	6	12	6	16	-	-	44
60 - 64	7	10	4	9	9	4	8	51
65 - 69	3	5	-	1	1	2	6	18
70 - 74	1	-	-	-	-	-	-	1
Total 31-Dec-2019	30	49	40	28	28	6	14	195
Total 31-Dec-2017	43	67	52	29	31	10	20	252

Age Profile

	Average Monthly Pension							
	Actives et al		***Deferreds et al***		***Pensioners et al***		***Total***	
Age Band	***Count***	***Average Monthly Pension***	***Count***	***Average Monthly Pension***	***Count***	***Average Monthly Pension***	***Count***	***Average Monthly Pension***
20 - 24	-	-	-	-	-	-	-	-
25 - 29	-	-	-	-	-	-	-	-
30 - 34	1	110	8	90	-	-	9	92
35 - 39	5	235	11	167	-	-	16	188
40 - 44	12	422	24	240	-	-	36	301
45 - 49	19	746	46	291	-	-	65	424
50 - 54	44	866	35	398	1	277	80	654
55 - 59	44	1,169	40	471	2	533	86	830
60 - 64	51	1,620	55	540	17	946	123	1,044
65 - 69	18	2,493	26	534	63	952	107	1,110
70 - 74	1	129	5	140	85	809	91	764
75 - 79	-	-	2	102	79	935	81	915
80 - 84	-	-	-	-	54	697	54	697
85 - 89	-	-	-	-	50	581	50	581
90 - 94	-	-	-	-	23	752	23	752
95 - 99	-	-	-	-	12	251	12	251
100 - 104	-	-	-	-	-	-	-	-
105 - 109	-	-	-	-	-	-	-	-
110 - 114	-	-	-	-	-	-	-	-
31-Dec-2019	195	1,219	252	393	386	795	833	773
31-Dec-2017	252	1,175	254	379	379	751	885	765



APPENDIX III

Summary of Plan Provisions

The following description of the Plan is a summary only. For more complete information, reference should be made to the Plan text.

Effective September 1, 2014, the plan was amended and restated.

- to set a default investment option under the Defined Contribution (DC) provision of the Plan; and
- to require each member to immediately vest all service in the Plan; and
- to provide the ability for a member to elect pension commencement prior to the Plan's pension eligibility date; and
- to provide a provision for unlocking due to shortened life expectancy and non-residency; and
- to provide full commuted value for death benefits; and
- to provide for any other changes or revisions to the Employment Pension Plan Act and Regulations.

Effective Date

The effective date of the restated Plan is January 1, 2012.

Eligibility

Eligibility and membership are effective on the first day of the calendar month next following the date of employment.

Member and Employers DC Contributions

Effective January 1, 2012, each active DC member will be required to contribute 4% of earnings under the defined contribution provision.

Effective January 1, 2013, each active DB/DC member will be required to contribute 4% of earnings under the defined contribution provision.

Disabled DC and DB/DC members are not required to contribute under the defined contribution provision.

The Church will contribute 6% of earning in respect of the above active and disabled DC and DB/DC members.

Member DB Contributions

Effective January 1, 2013, each active DB member will be required to contribute 4% of earnings under the defined benefit provision.

Normal Retirement

Normal retirement is at the first day of the month coincident with or next following the member's 65th birthday.

Monthly pension equals to the Accrued Pension (DB Benefit) plus a monthly pension that the member can purchase from the member's contribution account balance (DC Benefit).

Maximum DB Pension equals the lesser of:

- $3025.56 or other amount as determined by the Income Tax Act, times total defined benefit Credited Service (pre-1992 service not exceeding 35 years); or

- 2% times the average of the member's highest three years of indexed compensation times total credited service.

Early Retirement

DC Benefit

Monthly pension the member can purchase from the member's contribution account balance.

DB Benefit

Benefit may commence on the first day of the month coincident with or next following the member's 55th birthday and the completion of two years of Continuous Service.

Monthly pension:

- Retirement at Age 60 to 65: Monthly Accrued Pension reduced by 0.55% per month that retirement precedes age 65.

- Retirement at Age 55 to 60: Monthly Accrued Pension reduced by 33% plus an additional 0.27% for each month that retirement precedes age 60.

The above reduction does not apply if at the date of termination of employment, the member has attained age 62 and the total of his age and Credited Service equals or exceeds 85 years.

Maximum pension upon early retirement equals the monthly Maximum DB Pension reduced by 1/12 of 3% for each month before the earliest of age 60, 30 years of Continuous Services, or the date age plus Continuous Service equals 80.

Postponed Retirement

Where a member continues employment after normal retirement age, Accrued Pension is calculated at postponed retirement date including accruals after normal retirement age plus the monthly pension the member can purchase from the member's contribution account balance.

Normal Forms of Pension

Member with no spouse

Pension payable for life of member with a guarantee of at least ten years of pension payments.

Member with a spouse

Pension payable for life of member with a guarantee of five years and, thereafter, 66 2/3% of pension continued to surviving spouse.

Termination Benefits

DC Benefit

Entitlement to the distribution of member's account balance.

DB Benefit

Monthly pension equals to the Accrued Pension commencing at normal retirement age.

An Inactive Member who is at least age 55 has the right to receive an early retirement benefits subject to reduction described above.

Member may elect to transfer the commuted value of his vested benefit to a locked in registered vehicle if at the date of termination of employment, the member has not attained age 55.

Death Benefits

Before Retirement

If the member has an eligible spouse and dies after age 55, the spouse will receive a pension payable for life equal to 66 2/3% of the amount the member would have received had the member retired on his date of death.

If the member has an eligible spouse and dies prior to attaining age 55, the spouse will receive for life a pension equal to 66 2/3% of the amount the member would have received had the member lived to age 55 and retired.

The spouse or beneficiary shall receive 100% of the commuted value in respect of service after 1999 (all valued as Alberta members).

After Retirement

Based on form of pension elected by the member.

Ad hoc Pension Increases

Effective January 1, 2002, each member who retired prior to 2002 and who was in receipt of pension payments, received an ad hoc pension increase equal to 1%.

Definitions

Average YMPE

The lesser of:

- The average of the YMPE for the year of determination and the two preceding years; or
- Final Average Earnings.

Accrued Pension

DC Benefit – The value of the member's contribution account balance.

DB Benefit – Equal to the greater of:

- 1.25% of the Final Average Earnings up to the Average YMPE, plus 1.60% of the Final Average Earnings in excess of the Average YMPE multiplied by Credited Service; or
- $48 multiplied by Credited Service.

Continuous Service – Total service with Lutheran Church – Canada.

Credited Service – Total service while an active member of the defined benefit provisions of the plan.

Final Average Earnings – Average monthly regular earnings for the 60 consecutive months in which regular earnings were highest within the last 20 years of Credited Service.

APPENDIX IV

Going Concern Assumptions and Valuation Methods

Actuarial Assumptions and Methods	31-Dec-2019	31-Dec-2017
1. Actuarial Cost Method	Projected Unit Credit	same
2. Asset Valuation Method	market value plus an asset smoothing adjustment	same
3. Expense Reserve		
- balance sheet	nil	same
- contribution rate	nil	same
- assumed rate of return	0.75%	0.65%
4. Contingency Adjustment	nil	same
5. Assumed Rate of Return		
- inflation rate	2.00%	same
- real rate	3.50%	same
- total nominal rate	5.50%	same
6. Assumed Salary Increase Rate		
- inflation rate	2.00%	same
- productivity rate	0.75%	same
- merit	0.00%	same
- total nominal rate	2.75%	same
7. Assumed Annual Salary (Last Salary - Actives)	$63,688	$60,215
8. Indexing		
- if retired or eligible to retire	n/a	same
- otherwise	n/a	same
9. Annual Employee Contributions Interest Credit	5-year fixed term yield rates average	same
10. Annual Rate of Increase in CPP Earnings Maximum	2.75%	Same
11. Rate of CRA Maximum Pension Increase under the Income Tax Act	2019: $3,025.56 Indexed at 2.75% thereafter	2018: $2,944.44 same
12. Retirement Age		
- Active - if retired or eligible to retire	See Table 1 (Appendix IV, Page 6)	same
- Inactive - if retired or eligible to retire	See Table 1 (Appendix IV, Page 6)	same
13. Termination Rates	nil	same
14. Disability Rates	nil	same
15. Mortality Rates	CPM 2014 Private Mortality Projected using Scale B	same
16. Unisex Weightings*		
- if retired or eligible to retire	sex distinct	same
- otherwise	sex distinct	same
17. Proportion of Employees with a Spouse	85%	same
18. Age of Spouse		
- retired members and beneficiaries	actual	same
- otherwise	+/-3	same
19. Proportion of Employees Choosing an Annuity		
- retired members and beneficiaries	n/a	same
- otherwise	n/a	same

* Liabilities are calculated using actual Member gender. The unisex percentage for individual calculations is calculated using a liability weighted methodology based on active Members. The unisex weighting is 85% male and 15% female. This is unchanged from the previous valuation

Going Concern Actuarial Cost Method

Actuarial cost methods are used to recognize and fund pension benefits over the working lifetimes of employees who will ultimately receive a pension benefit from the Plan. Different actuarial cost methods use different approaches to assign the costs of future pension benefits, in all cases the contributions plus investment income should equal or exceed the benefit at retirement plus any associated expenses.

The projected unit credit cost method was used to calculate the going concern liabilities and normal cost presented in this Report. This cost method accounts for salary increases by projecting employee earnings to the assumed retirement date. The benefit is then calculated at the assumed retirement date and redistributed across the employee's career. The liabilities presented in this report only reflect service accrued up to the valuation date and the normal cost reflects service that will be earned in the year following the valuation date.

Employment Pension Plans Act

Pursuant to the Employment Pension Plans Act (EPPA) of Alberta and the Regulations to the EPPA, the required contributions to be paid into the Plan, on at least a monthly basis (or within 30 days of the relevant month end) include:

Normal Actuarial Cost

In respect of current service, an amount equal to the normal actuarial cost allocated as stated in the most recent actuarial Valuation report or cost certificate filed with this Report.

Going Concern Payments

An unfunded liability must be funded by equal payments in an amount that is sufficient to amortize the liability over a term not exceeding 15 years from the review date that established the liability.

Solvency Payments

A solvency deficiency must be funded by equal payments that are sufficient to amortize the deficiency over a term not exceeding 5 years, or such period permitted by ASP, from the review date that established the deficiency. Solvency relief was elected as at December 31, 2012 and existing solvency payments were consolidated and re-amortized over a 10-year period.

Transfer Ratio Payments

The amount of any solvency deficiency payments related to a solvency ratio of less than one in respect of lump sum settlements.

Contributions in Arrears with Interest

All contribution requirements not remitted in accordance with the actuarial valuation report shall be payable in the ensuing year, with interest, subject to the approval of the ASP and CRA.

It should be noted that the contribution levels do not anticipate any Plan change, change in actuarial basis, plan membership change, nor any experience gains (or losses), which may arise in the future. Should any of the above occur, a re-examination of the above recommendation may be necessary.

Amortization schedules for going concern unfunded liabilities and solvency deficiencies may be adjusted if experience gains arise after the amortization schedules are determined. For 2020, it is recommended that the contributions equal the normal actuarial cost, going concern special payments, solvency test special payments, transfer ratio payments, and contributions in arrears with interest, as applicable.

The opinion is this Report is subject to our understanding that ASP is aware and has granted regulatory forbearance such that the solvency payments for the Plan have not been remitted to date and are not required to be remitted by the Plan although no formal solvency exemption exists.

Asset Smoothing Adjustment

This Report uses an adjusted market value of assets. The adjusted market value of assets is calculated using a 5-year asset smoothing adjustment with a 10% corridor. The following table develops the asset smoothing as at December 31, 2019:

Calendar Year	Gross Investment Income	Rate of Return Gross	Rate of Return Assumed	Investment Gain/ (Loss)	Asset Smoothing Adjustment Proportion		Asset Smoothing Adjustment Amount
2015	$ 4,989,263	6.16%	6.70%	$ (437,370)	0.00%		$ -
2016	6,003,485	8.79%	6.70%	1,427,450	20.00%		285,490
2017	6,696,277	9.16%	6.70%	1,798,345	40.00%		719,338
2018	617,921	0.79%	6.15%	(4,192,477)	60.00%		(2,515,486)
2019	10,963,752	14.46%	6.15%	6,300,745	80.00%		5,040,596
					Calculated Asset Smoothing Adjustment:	Preliminary	$ 3,529,938
					Minimum Asset Smoothing Adjustment (-10.00% of assets):	Min	(8,538,359)
					Maximum Asset Smoothing Adjustment (+10.00% of assets):	Max	8,538,359
						Ires	3,529,938
					Provision for future Adverse Deviation:	PfAD	-
					Final Asset Smoothing Adjustment 31-Dec-2019:	Ires+PfAD	$ 3,529,938

Expense Provisions

Expenses of operation and investment are generally allocated, or not, in three areas:

A. Directly in the development of the contribution rate. No allocation was made for the Plan's Actuarial Valuation Report (AVR). Some actuaries use this exclusively for expense allocation and others do not. This Plan does, however, have some implicit allocation in the development of the normal actuarial cost through the use of the 5.50% discount rate used in the calculations. For this AVR, the operating expenses were placed in the development of the implicit rate of return calculation.

B. Directly on the balance sheet. No such allocation was made on the going concern balance sheet.

C. Directly in the development of the assumed rate of return. After recognizing the allocation in A. above we find that an additional allocation 0.40% is required to provide for operating expenses, plus a separate provision of 0.35% to provide for investment and custodial fees. Some actuaries use this exclusively for expense allocation and others do not. For next year it is expected that operating & investment expenses will be approximately 0.75%.

The following table details the allocation for the 2019 Plan year:

Expense Analysis	2019 Expense	A. Directly to Contribution Rate	B. Directly to Balance Sheet	C. Directly to Assumed Rate $	C. Directly to Assumed Rate % of Assets	Budget
Operating Expenses**	333,091	$ -	$ -	$ 333,091	0.41%	0.40%
Investment Expenses	287,058	-	-	287,058	0.35%	0.35%
Total Expenses	$ 620,149	$ -	$ -	$ 620,149	0.76%	0.75%

* Average Assets at Market Value = $77,193,468 x 0.5 + $85,383,592 x 0.5 = $81,288,530

** Includes actuarial, administration, accounting, audit, AIR fees, etc.

Contingency Adjustment Assumption

A contingency adjustment provides for the possibility of future adverse investment and/or demographic experience. This Report does not reflect a contingency adjustment on either the going concern or solvency test balance sheets.

Development of the Going Concern Rate of Return

The discount rate assumption is 5.50% per year.

The overall expected return ("best estimate") is 5.64%, which is based on an inflation rate of 2.00%, resulting in a real rate of return on the pension fund assets of 3.64% per year. This best estimate rate of return was developed using best estimate returns for each major asset class in which the pension fund is invested and then using a building block approach, based on the Plan's investment policy, to develop an overall best estimate rate of return for the entire pension fund. Any additional gains from rebalancing and diversification have been included.

Inflation	2.00%
Real Rate of Return (expected protfolio mix)	3.64%
Overall expected return	5.64%
Expenses	
Investing	(0.35%)
Operating	(0.40%)
Additional returns due to active management	0.25%
Rebalancing and Diversification	0.40%
Margin for adverse deviations (MfAD)	(0.04%)
Discount Rate	**5.50%**

The current discount rate has an estimated 4 basis points of margin for adverse deviation and will continue to be monitored.

Salary Increase Rate

The salary increase rate is developed based on a building block approach using the following components: inflation, productivity, and merit. The inflation and productivity assumptions are based on the following schedule:

	31-Dec-2019			31-Dec-2017	
Age Band	Count	Average Pensionable Salary*	2-Year Change %	Count	Average Pensionable Salary*
25 - 29	-	-	0.0%	-	-
30 - 34	1	45,273	3.1%	1	43,924
35 - 39	5	66,871	11.6%	12	59,945
40 - 44	12	67,316	(1.1%)	25	68,048
45 - 49	19	75,482	28.1%	40	58,915
50 - 54	44	63,689	2.4%	43	62,185
55 - 59	44	69,080	15.7%	61	59,726
60 - 64	51	55,751	(5.0%)	52	58,709
65 - 69	18	60,088	5.5%	17	56,974
70 -74	1	30,818	115.5%	1	14,300
Total/Average	195	$ 63,688	5.8%	252	$ 60,215

* Last salaries of Active and Disabled Members only.

Annuity Buy-in

The annuity buy-in assets and liabilities were valued on a solvency basis. Thus, the annuity buy-in asset value is equal to the annuity buy-in liability value on the going concern and solvency balance sheet.

Retirement Age Assumption

We note that there are many acceptable going concern retirement age assumptions, and certainly it would be appropriate to use the first subsidized age.

The retirement age assumption should consider:

- the plan design features
- historical experience and
- the future outlook for retirement experience.

For a plan that includes material early retirement subsidies, it is viewed as inappropriate to use a retirement age assumption that ignores the possibility of members taking advantage of the plan's early retirement options.

For this Report, Active, Disabled, and Deferred retirement rates are based on age in accordance with the following table:

Table 1 – Retirement Rates

Age	Male and Female
55	0.050
56	0.050
57	0.050
58	0.050
59	0.050
60	0.100
61	0.100
62	0.200
63	0.200
64	0.200
65	0.100

The retirement rates at December 31, 2019 remain unchanged from the previous valuation.

APPENDIX V

Solvency Assumptions and Valuation Methods

Actuarial Assumptions and Methods	*31-Dec-2019*	*31-Dec-2017*
1. Actuarial Cost Method	accrued benefit cost method	same
2. Asset Valuation Method	market value of assets	same
3. Expense Reserve		
- balance sheet	$250,000	same
- contribution rate	nil	same
- assumed rate of return	nil	same
4. Contingency Adjustment	nil	same

5. Assumed Rate of Return	31-Dec-2019 Annuity Purchases	31-Dec-2019 Cash Settlements <10 Yrs	31-Dec-2019 Cash Settlements >10 Yrs	31-Dec-2017 Annuity Purchases	31-Dec-2017 Cash Settlements <10 Yrs	31-Dec-2017 Cash Settlements >10 Yrs
- inflation rate	2.54%	1.20%	1.29%	2.45%	1.25%	1.80%
- real rate	0.41%	1.20%	1.21%	0.57%	1.35%	1.60%
- total nominal rate	2.95%	2.40%	2.50%	3.02%	2.60%	3.40%

Actuarial Assumptions and Methods	*31-Dec-2019*	*31-Dec-2017*
6. Assumed Salary Increase Rate		
- inflation rate	n/a	same
- productivity rate	n/a	same
- merit	n/a	same
- total nominal rate	n/a	same
7. Assumed Annual Salary	n/a	same
8. Indexing		
- If retired or eligible to retire	n/a	same
- otherwise	n/a	same
9. Annual Employee Contributions Interest Credit	n/a	same
10. Annual Rate of Increase in CPP Earnings Maximum	n/a	same
11. Rate of CRA Maximum Pension Increase under the Income Tax Act	2019: $3,025.56	2018: $2,944.44
12. Retirement Age		
- if retired or eligible to retire	immediate	same
- otherwise	age 65	same
13. Termination Rates	nil	same
14. Disability Rates	nil	same
15. Mortality Rates	CPM2014 Mortality Table Projected using Scale B	same
16. Unisex Weightings		
- if retired or eligible to retire	sex distinct	same
- otherwise	sex distinct	same
17. Proportion of Employees with a Spouse	85%	same
18. Age of Spouse		
- retired members and beneficiaries	actual	same
- otherwise	+/-3	same
19. Proportion of Employees Choosing an Annuity		
- retired members and beneficiaries	100%	same
- otherwise	0%	same

* Liabilities are calculated using actual member gender. The unisex percentage for individual calculations is calculated using a liability weighted methodology based on active Members. The unisex weighting is 85% male and 15% female. This is unchanged from the previous valuation.

Solvency Cost Method

A solvency and hypothetical wind-up valuation determine the funded status of the Plan on the assumption that the Plan is terminated and wound up at the valuation date. Under this scenario current earnings and YMPE values are used to determine employee benefits. Contingent benefits are included in the calculation when appropriate.

This Report uses an accrued benefit cost method when calculating the solvency/hypothetical wind-up funded status. This cost method determines employee benefits based on service accrued up to the valuation date and assumes no increases in future earnings.

Solvency/Hypothetical Wind-Up Asset Valuation Method

This Report uses the market value of assets.

Wind-Up Expenses

Solvency and hypothetical wind-up valuations require that the actuary explicitly reflect any costs associated with the wind-up on the solvency/hypothetical wind-up balance sheet. This Report reflects a wind-up expense allowance of $250,000.

Annuity Purchases

1. Basis: Educational Note - Assumption for Hypothetical Wind-Up and Solvency Valuations with Effective Dates between December 31, 2019 and December 30, 2020.
2. Members valued: Members who are retired or who are eligible to retire.
3. Retirement Age: Immediate (current age).
4. Mortality: CPM2014 Mortality Table projected using Scale B.
5. Interest Rate: In accordance with the Guidance provided by the Canadian Institute of Actuaries. The annuity purchase rate was determined to be 2.95%

Commuted Value (CV) Basis – Non-Indexed rates are required for the Plan

1. Basis: Commuted values (CVs) were calculated in accordance with the Canadian Institute of Actuaries (CIA) Standard of Practice – Practice-Specific Standards for Pension Plans, Section 3500.
2. Members Valued: Members who are not retired or eligible to retire.
3. Retirement Age: Optimal retirement age was assumed that provided the largest CV.
4. Mortality: CPM2014 Mortality Table projected using Scale B.
5. Interest Rates: The non-indexed interest rate changes monthly. For example, the non-indexed interest rates for December 2019 were 2.40% for the first 10 years, and 2.50% thereafter.

Development of the Annuity Purchase Rate – Non-Indexed

On April 24, 2020, the Canadian Institute of Actuaries (CIA) released an Educational Note "Assumptions for Hypothetical Wind-Up and Solvency Valuations with Effective Dates between December 31, 2019 and December 30, 2020" outlining how to determine the annuity purchase rate to be used for solvency valuations as at December 31, 2019.

Determine the duration of the portion of the liabilities assumed to be settled through the purchase of annuities based on a discount rate of 2.96% (CANSIM V39062 plus 120 bps at December 31, 2019).

Liabilities were calculated for the members who were retired or eligible to retire as at December 31, 2019 (age 55 or older) using a discount of 2.96% and 2.97% to determine the duration. Their liabilities are as follows:

	Liabilities	
Discount Rate	2.96%	2.97%
Active-R	23,373,636	23,343,388
Disabled-R	1,105,864	1,104,391
Deferred-R	11,186,749	11,172,592
Pensioner-R/Survivor-R	49,008,844	48,962,297
Total	84,675,093	84,582,668

Using these liabilities, duration was determined to be 10.93 for this group of members retired or eligible to retire. To determine the spread above the unadjusted CANSIM V39062, we interpolated using the following table:

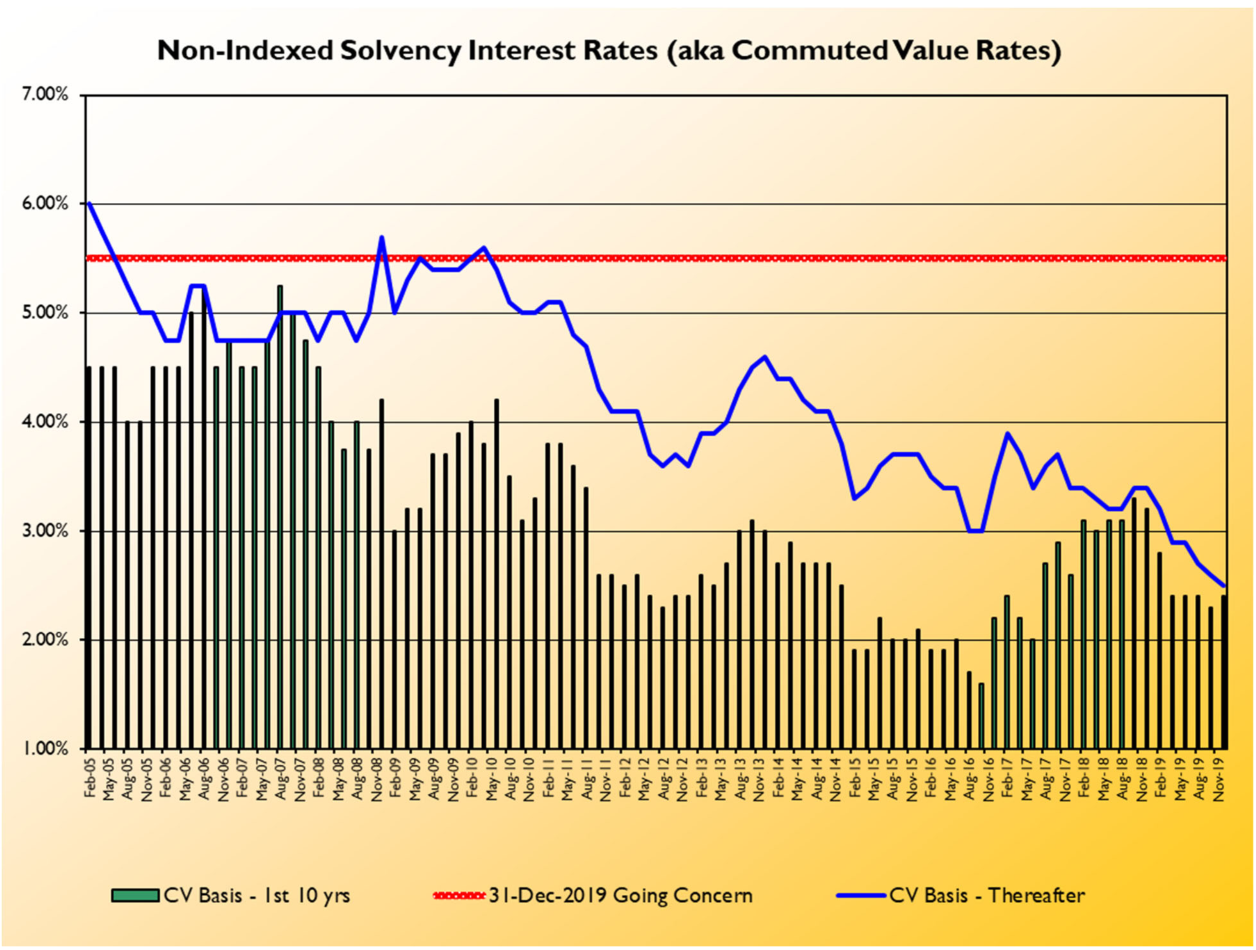
Illustrative Block	Duration based on 2.96% discount rate	Spread above unadjusted CANSIM V39062
Low Duration	8.6	+ 110 bps
Medium Duration	11.2	+ 120 bps
High Duration	13.7	+ 120 bps

The spread calculated was 1.19%. Therefore, the CAMSIM V39062 as at December 31, 2019 (1.76%) plus the spread (1.19%) is equal to the Annuity Purchase rate of 2.95%.

Development of the Solvency Test Rate of Return – Non-Indexed

The discount rates for cash settlements in the solvency Valuation are based on the same rates that are used for the commuted value calculations including the 1-month lag as required by the Canadian Institute of Actuaries (CIA) standards. Effective for events commencing in October, 2015, the Canadian Institute of Actuaries (CIA) standards utilize the 2014 Canadian Pensioners Mortality Table (CPM2014) with generational projection using Scale B, and the dual interest rates, one applicable to the first 10 years and the other applicable thereafter. These rates are based on the following CANSIM series and formulas:

Lump Sum Formula				Spot Rate	Used Rate
CANSIM V122542 NOVEMBER, 2019 RATE (i_7)			=	1.50%	n/a
CANSIM V122544 NOVEMBER, 2019 RATE (i_L)			=	1.58%	n/a
First 10 Years:	=	$i_7 + 0.90\%$	=	2.40%	2.40%
After 10 Years:	=	$i_L + 0.5 * (i_L - i_7) + 0.90\%$	=	2.52%	2.50%



75 Re	16 S	66 Dy	4 Be	57 La	34 Se	03 Li	01 H
105 Db	74 W	58 Ce	22 Ti	18 Ar	59 Pa	24 Cr	39 Y
50 Sn	74 Ru	10 Ca	103 Lr	66 Dy	45 Rh	82 Pb	31 Ga
47 Ag	06 C	13 Al	83 Bi	80 Hg	81 Tl	79 Au	39 V
28 Ni	07 N	32 Ge	51 Sb	78 Pt	76 Os	89 Ac	77 Ir
87 Fr	56 Ba	11 Na	73 Ta	19 K	38 Sr	55 Cs	02 He
10 Ne	08 O	54 Xe	70 Yb	100 Fm	98 Cf	97 Bk	09 F
36 Kr	92 U	94 Pu	95 Am	90 Th	101 Md	99 Es	49 In
107 Bh	64 Gd	63 Eu	69 Tm	65 Tb	17 Cl	109 Mt	48 Cd
106 Sg	92 U	94 Pu	95 Am	90 Th	101 Md	99 Es	49 In
40 Zr	64 Gd	63 Eu	69 Tm	65 Tb	17 Cl	109 Mt	48 Cd

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