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Actuarial Valuation as at December 31, 2015 for Supplementary Retirement Plan for Public Service Managers

March 13, 2017

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Executive Summary

An actuarial valuation has been prepared for the Supplementary Retirement Plan for Public Service Managers (the "Plan") as at December 31, 2015 for the primary purpose of establishing a funding range for the Plan until the next actuarial valuation is performed. This section provides an overview of the important results and the key valuation assumptions which have had a bearing on these results. The next actuarial valuation for the purposes of developing funding requirements should be performed no later than as at December 31, 2018.

Summary of Principal Results

December 31, 2015	December 31, 2015	December 31, 2012
Assets	$ 158,820,000	$ 103,323,000
Liabilities	$ 212,130,000	$ 123,110,000
Actuarial Excess/(Deficit)	**$ (53,310,000)**	**$ (19,787,000)**

Contribution Requirements

The contribution rates established as a percentage of excess earnings, are as follows:

	December 31, 2015	December 31, 2012
Member Contribution Rate to RCA Fund / RTA	12.80%	11.16% in 2013 12.80% thereafter
Matching Employer Contribution Rate to RCA Fund / RTA	12.80%	11.16% in 2013 12.80% thereafter
Employer Contribution Rate to Reserve Fund	9.9%	22.6% (January 1, 2013) 2.4% (April 1, 2014) 9.9% (April 1, 2015)

Key Assumptions

The principal assumptions to which the valuation results are most sensitive are outlined in the following table.

	December 31, 2015	**December 31, 2012**
Rate of return on assets	RCA Fund: 2.50% per year Reserve Fund: 6.0% per year	RCA Fund: 2.50% per year Reserve Fund: 6.25% per year
Discount rate	4.0% per year	4.1% per year
Inflation rate	2.0% per year	2.25% per year
Salary increase – Base	0.0% for 2016, 0.0% for 2017, then 2.75% per year thereafter	0.0% for 2013, 2.0% for 2014, 2.25% for 2015, 2.5% for 2016, then 3.0% per year thereafter
Salary increase – Merit and Promotion	0.8% per year	1.3% per year
Maximum pension increase	2.75% per year	3.0% per year
Mortality table	2014 Canadian Public Sector Pensioner Mortality Table (“CPM2014Publ”) with generational improvements using CPM Scale B2D (“CPMB2D2014”)	1994 Uninsured Pensioner (“UP94”) Mortality Table with generational improvements using Scale AA
Retirement rates	Rates following 2016 experience study for MEPP	Rates following 2012 experience study for MEPP
Employer contribution rate to Reserve Fund	9.9%	22.6% (January 1, 2013 to March 31, 2014) 2.4% (April 1, 2014 to March 31, 2015) 9.9% (April 1, 2015)

Section 1: Introduction

Purpose and Terms of Engagement

We have been engaged by the Supplementary Retirement Plan for Public Service Managers Advisory Committee, and hereafter referred to as the "Committee", to conduct an actuarial valuation of the Plan, as at December 31, 2015 for the general purpose of determining the funding contributions based on the actuarial assumptions and methods summarized herein. More specifically, the purposes of the valuation are to:

- Determine the financial position of the Plan on a going concern basis as at December 31, 2015; and
- Determine whether the contribution rate is sufficient to meet the funding requirements to the Reserve Fund to eliminate the deficit.

The results of this report may not be appropriate for accounting purposes or any other purposes not listed above. The next required valuation will be as at December 31, 2018.

Summary of Changes Since the Last Valuation

The last such actuarial valuation in respect of the Plan was performed as at December 31, 2012. Since the time of the last valuation, we note that the following events have occurred:

- Going concern actuarial assumptions have been revised. The changes are summarized as follows:
  - The discount rate assumption changed to 4.0% per year from 4.1% per year.
  - The inflation rate assumption changed to 2.0% per year from 2.25% per year.
  - The ITA maximum pension limit increase was changed to 2.75% per year from 3.0% per year.
  - The salary rate assumption was changed to 0.0% per year for 2016 and 2017, and 2.75% per year thereafter from 2.5% per year for 2016 and 3.0% per year thereafter.
  - The salary increase for merit and promotion assumption was changed to 0.8% per year from 1.3% per year.
  - The mortality table was changed to the 2014 Canadian Public Sector Pensioners' Mortality Table with mortality improvement scale CPM-B from the 1994 Uninsured Pensioner Mortality Table with mortality improvement Scale AA.
  - The termination rates assumption has been changed based on the 2016 experience study for the Management Employees Pension Plan ("MEPP") from the termination rates based on the 2012 experience study for MEPP.
  - The retirement rates assumption has been changed based on the 2016 experience study for MEPP from the retirement rates based on the 2012 experience study for MEPP.
  - The non-retired pension partner proportion assumption was changed to 80% from 90%.

Information and Inputs

In order to prepare our valuation, we have relied upon the following information:

- A copy of the previous valuation report as at December 31, 2012;
- Membership data compiled as at December 31, 2015 by Alberta Pensions Services Corporation ("APS");
- Asset data taken from the Plan's audited financial statements; and
- Confirmation of the Plan's provisions up to and including December 31, 2015.

Furthermore, our actuarial assumptions and methods have been chosen to reflect our understanding of the Plan's desired funding objectives with due respect to accepted actuarial practice.

Subsequent Events

As of the date of this report, we have not been made aware of any subsequent events which would have an effect on the results of this valuation. However, the following points should be noted in this regard:

- Actual experience deviating from expected after December 31, 2015 will result in gains or losses which will be reflected in the next actuarial valuation report; and
- To the best of our knowledge, the results contained in this report are based on the legal environment in effect at the date of this report and do not take into consideration any potential changes that may be currently under review. To the extent that actual changes in the legal environment transpire, any financial impact on the Plan as a result of such changes will be reflected in future valuations.

Section 2: Results

Financial Position of the Plan

The financial position of the Plan on the going concern basis is measured by comparing the actuarial value of assets to the actuarial value of liabilities at the valuation date on the premise that the Plan continues on into the future indefinitely.

The selection of the applicable actuarial assumptions and methods reflect the Plan's funding objectives, as communicated by the Committee, actuarial standards of practice, and pension standards.

On the basis of the Plan provisions, membership data, assumptions and methods, and asset information described in the Appendices, the financial position of the Plan on a going concern basis as at December 31, 2015 is shown in the following table. The results as at December 31, 2012 are also shown for comparison purposes.

Financial Position

	December 31, 2015	December 31, 2012
Assets		
Retirement Compensation Arrangement	$ 22,013,000	$ 19,200,000
Refundable Tax Account	33,398,000	25,241,000
Reserve Fund	103,409,000	58,882,000
Actuarial Value of Assets	**$ 158,820,000**	**$ 103,323,000**
Actuarial Liabilities		
Active members	$ 115,422,000	$ 77,536,000
Pending members	2,847,000	0
Deferred vested members	8,206,000	5,105,000
Amounts held on deposit	515,000	158,000
Retired members and beneficiaries	85,140,000	40,311,000
Total Liabilities	**$ 212,130,000**	**$ 123,110,000**
Actuarial Excess/(Unfunded Liability)	**$ (53,310,000)**	**$ (19,787,000)**

On the basis of the Plan provisions, membership data, assumptions and methods and asset information described in the Appendices, the contribution requirements of the Plan as at December 31, 2015 are shown in the following table as a percentage of excess earnings. The contribution requirements as at December 31, 2012 are also shown for comparison purposes.

Contribution Requirements

	December 31, 2015	December 31, 2012
Member Contribution Rate to RCA Fund / RTA	12.80%	11.16% in 2013 12.80% thereafter
Matching Employer Contribution Rate to RCA Fund / RTA	12.80%	11.16% in 2013 12.80% thereafter
Employer Contribution Rate to Reserve Fund	9.9% (April 1, 2015) 11.6% (April 1, 2017)	22.6% (January 1, 2013) 2.4% (April 1, 2014) 9.9% (April 1, 2015)

Given the Employer contributions into the Reserve Fund will remain at 9.9%, these are insufficient to meet the funding requirements determined using the methodology set out in this report. In order for the Plan to meet its obligations, contributions will need to be increased at some point in the future, or significant actuarial experience gains will need to occur.

Change in Financial Position

During the period from December 31, 2012 to December 31, 2015, the financial position of the Plan changed from an unfunded liability of $19,787,000 to an unfunded liability of $53,310,000. The major components of this change are summarized in the following table.

Reconciliation of the Financial Position
For the Period from December 31, 2012 to December 31, 2015

Actuarial Excess/(Unfunded Liability) as at December 31, 2012	**$**	**(19,787,000)**
Expected interest on actuarial excess/(unfunded liability)		(2,535,000)
Expected Actuarial Excess/(Unfunded Liability) as at December 31, 2015	**$**	**(22,322,000)**
Change in financial position due to experience gains/(losses)		
Gain/(loss) from investment earnings greater/lower than expected		18,281,000
Gain/(loss) due to salary increases lower/greater than expected		(40,187,000)
Gain/(loss) due to demographic experience		(14,236,000)
Gain/(loss) due to contributions		9,772,000
Net gain/(loss) due to other experience and miscellaneous items		(14,222,000)
Actuarial Excess/(Unfunded Liability) After Experience Gains/(Losses) as at December 31, 2015	**$**	**(62,914,000)**
Change in liabilities due to change in economic assumptions		7,316,000
Change in liabilities due to change in demographic assumptions		2,288,000
Change in liabilities due to plan amendments		0
Actuarial Excess/(Unfunded Liability) as at December 31, 2015	**$**	**(53,310,000)**

Discussion of Experience Gains and Losses

Investment Earnings

The annualized rate of return earned by the RCA Fund based on the Actuarial Value of Assets for the valuation period from December 31, 2012 to December 31, 2015 was 4.0% per year. The assumed rate of return for the RCA Fund for valuation purposes is 2.50% per year. The annualized rate of return earned by the Reserve Fund based on the Actuarial Value of Assets for the valuation period from December 31, 2012 to December 31, 2015 was 13.6% per year. The assumed rate of return for the Reserve Fund for valuation purposes is 6.25% per year. An actual rate of return greater than the assumed rate resulted in a net actuarial gain of $18,281,000.

Salary Experience

The annualized salary rate paid to members of the Plan for the valuation period from December 31, 2012 to December 31, 2015 was 7.3% per year. The assumed salary rate for going concern valuation purposes is 2.30% per year, which consists of the base salary increase rate and the salary increase due to merit and promotion. An actual salary rate paid to members of the Plan greater than the assumed rate resulted in a net actuarial loss of $40,187,000.

Demographic Experience

Over the inter-valuation period, the Plan experienced an actuarial loss of $14,236,000 due to retirements, terminations and mortality. This is due to a combination of more retirements occurring than expected, the prescribed transfer value basis which produced a lump sum payout greater than the liability held on a funding basis, and pensioners surviving slightly longer than anticipated, combined with lump sum payments greater than expected.

Discussion of Changes in Assumptions

Effective December 31, 2015, the following assumptions were changed:

Economic Assumption

- Base salary increase rate was changed to 0.0% in 2016 and 2017 and 2.75% per year thereafter from 2.5% in 2016 and 3.0% per year thereafter.
- Inflation rate was changed to 2.0% per year from 2.25% per year.
- The ITA maximum pension limit increase was changed to 2.75% per year from 3.0% per year.
- Discount rate was changed to 4.0% per year from 4.1% per year.

In combination, these changes in assumptions decreased the actuarial liability by $7,316,000.

Demographic Assumptions

- The retirement table was changed based on the 2016 experience study for MEPP from the retirement table based on the 2012 experience study for MEPP, and is shown in Appendix D.
- The termination table was changed based on the 2016 experience study for MEPP from the termination table based on the 2012 experience study for MEPP, and is shown in Appendix D.
- The mortality table was changed to the 2014 Canadian Public Sector Pensioners' Mortality Table with mortality improvement scale CPM-B from the 1994 Uninsured Pensioner Mortality Table with mortality improvement Scale AA.
- The salary increase for merit and promotion assumption was changed to 0.8% per year from 1.3% per year.
- The non-retired pension partner proportion assumption was changed to 80% from 90%.

In combination, these changes in assumptions decreased the actuarial liability by $2,288,000.

Valuation Sensitivity Results

In accordance with the Canadian Institute of Actuaries Standards of Practice specific to pension plans that became effective December 31, 2010, the table below presents the sensitivity of the actuarial liability and current service cost of using a discount rate 1% lower than that used for the valuation.

	Valuation Basis December 31, 2015	Based on Rate of 1% Lower	Effect $	Effect %
Actuarial liability	$ 212,130,000	$ 253,818,000	$ 41,688,000	19.7%
Current service cost	$ 10,940,000	$ 13,750,000	$ 2,810,000	25.7%

Note that using a discount rate 1% higher than that assumed would result in a comparable reduction in the Plan's actuarial liability.

Section 3: Contribution Requirements

The assets of the Plan are held in three separate vehicles, the Retirement Compensation Account Fund, the Refundable Tax Account and the Reserve Fund. The following tables outline the projections of each of these accounts based on the actuarial assumptions and methods described in the Appendices. The years 2007 through 2015 represent actual results.

The methodology used to determine the contribution rate to the Reserve Fund is described in Appendix D.

RCA Fund

Year	RCA Assets Beginning of Year ($)	Net Contributions ($)	Total Benefit Payments ($)	Expenses ($)	Investment Income ($)	Transfer To/From RTA ($)	Transfer To/From Reserve ($)	RCA Assets End of Year ($)
2007	7,070,000	2,218,000	610,000	238,000	122,000	532,000	0	9,094,000
2008	9,094,000	3,067,000	846,000	304,000	(191,000)	385,000	0	11,205,000
2009	11,205,000	3,264,000	1,307,000	414,000	979,000	615,000	0	14,342,000
2010	14,342,000	2,957,000	1,700,000	525,000	1,318,000	35,000	0	16,427,000
2011	16,427,000	3,127,000	2,458,000	484,000	1,585,000	(40,000)	0	18,157,000
2012	18,157,000	3,168,000	3,118,000	521,000	1,078,000	436,000	0	19,200,000
2013	19,200,000	3,335,000	3,636,000	549,000	(330,000)	1,020,000	0	19,040,000
2014	19,040,000	3,981,000	4,267,000	592,000	1,921,000	1,985,000	(1,450,000)	20,618,000
2015	20,618,000	5,282,000	4,823,000	622,000	811,000	1,147,000	(400,000)	22,013,000
2016	22,013,000	5,286,738	5,312,775	629,464	542,131	2,385,322	0	24,284,952
2017	24,284,952	4,443,392	6,033,635	637,018	579,283	2,727,176	0	25,364,150
2018	25,364,150	4,271,571	6,732,208	644,662	595,288	3,068,460	0	25,922,599
2019	25,922,599	4,078,542	7,533,340	652,398	596,725	3,468,308	0	25,880,436
2020	25,880,436	3,884,523	8,431,584	660,227	581,920	3,924,832	0	25,179,900
2021	25,179,900	3,704,592	9,360,657	668,150	550,445	4,405,106	0	23,811,236
2022	23,811,236	3,513,641	10,323,915	676,168	501,700	4,911,108	0	21,737,601
2023	21,737,601	3,314,983	11,303,922	684,282	435,025	5,434,449	0	18,933,854
2024	18,933,854	3,111,564	12,342,676	692,493	349,301	5,996,688	0	15,356,237
2025	15,356,237	2,905,626	13,370,613	700,803	244,334	6,563,140	0	10,997,921
2026	10,997,921	2,695,649	12,984,357	709,213	137,474	6,423,441	0	6,560,915
2027	6,560,915	2,485,464	8,328,655	717,724	82,011	4,123,322	0	4,205,333
2028	4,205,333	2,278,529	5,757,525	726,337	52,567	2,852,479	0	2,905,046
2029	2,905,046	2,069,705	4,239,698	735,053	36,313	2,101,693	0	2,138,006
2030	2,138,006	1,859,817	3,253,949	743,874	26,725	1,613,612	0	1,640,337
2031	1,640,337	1,651,218	2,538,755	752,800	20,504	1,259,125	0	1,279,629
2032	1,279,629	1,449,105	1,966,900	761,834	15,995	975,453	0	991,448
2033	991,448	1,256,177	1,476,649	770,976	12,393	732,128	0	744,521
2034	744,521	1,069,338	1,033,631	780,228	9,307	512,162	0	521,469
2035	521,469	898,695	630,573	789,591	6,518	312,027	0	318,545
2036	318,545	752,940	272,419	799,066	3,982	134,219	0	138,201
2037	138,201	622,949	0	761,150	1,728	(864)	0	864
2038	864	508,503	0	509,367	11	(6)	0	6
2039	6	407,300	0	407,306	0	0	0	0
2040	0	317,856	0	317,856	0	0	0	0
2041	0	242,249	0	242,249	0	0	0	0
2042	0	180,316	0	180,316	0	0	0	0
2043	0	130,490	0	130,490	0	0	0	0
2044	0	95,825	0	95,825	0	0	0	0
2045	0	69,245	0	69,245	0	0	0	0
2046	0	48,078	0	48,078	0	0	0	0
2047	0	32,806	0	32,806	0	0	0	0
2048	0	22,433	0	22,433	0	0	0	0
2049	0	15,761	0	15,761	0	0	0	0
2050	0	10,021	0	10,021	0	0	0	0
2051	0	6,444	0	6,444	0	0	0	0
2052	0	4,026	0	4,026	0	0	0	0

Year	RCA Assets Beginning of Year ($)	Net Contributions ($)	Total Benefit Payments ($)	Expenses ($)	Investment Income ($)	Transfer To/From RTA ($)	Transfer To/From Reserve ($)	RCA Assets End of Year ($)
2053	0	2,262	0	2,262	0	0	0	0
2054	0	1,129	0	1,129	0	0	0	0
2055	0	474	0	474	0	0	0	0
2056	0	109	0	109	0	0	0	0
2057	0	26	0	26	0	0	0	0
2058	0	15	0	15	0	0	0	0

Refundable Tax Account

Year	RTA Assets Beginning of Year ($)	Contributions to RTA ($)	Transfer To/From RCA ($)	RTA Assets End of Year ($)
2007	9,404,000	2,212,000	(527,000)	11,089,000
2008	11,089,000	3,070,000	(381,000)	13,778,000
2009	13,778,000	3,185,000	(615,000)	16,348,000
2010	16,348,000	3,014,000	(35,000)	19,327,000
2011	19,327,000	3,130,000	40,000	22,497,000
2012	22,497,000	3,180,000	(436,000)	25,241,000
2013	25,241,000	3,334,000	(1,020,000)	27,555,000
2014	27,555,000	3,951,000	(1,985,000)	29,521,000
2015	29,521,000	5,024,000	(1,147,000)	33,398,000
2016	33,398,000	5,286,738	(2,385,322)	36,299,416
2017	36,299,416	4,443,392	(2,727,176)	38,015,632
2018	38,015,632	4,271,571	(3,068,460)	39,218,743
2019	39,218,743	4,078,542	(3,468,308)	39,828,978
2020	39,828,978	3,884,523	(3,924,832)	39,788,669
2021	39,788,669	3,704,592	(4,405,106)	39,088,155
2022	39,088,155	3,513,641	(4,911,108)	37,690,688
2023	37,690,688	3,314,983	(5,434,449)	35,571,223
2024	35,571,223	3,111,564	(5,996,688)	32,686,099
2025	32,686,099	2,905,626	(6,563,140)	29,028,586
2026	29,028,586	2,695,649	(6,423,441)	25,300,793
2027	25,300,793	2,485,464	(4,123,322)	23,662,935
2028	23,662,935	2,278,529	(2,852,479)	23,088,985
2029	23,088,985	2,069,705	(2,101,693)	23,056,998
2030	23,056,998	1,859,817	(1,613,612)	23,303,203
2031	23,303,203	1,651,218	(1,259,125)	23,695,295
2032	23,695,295	1,449,105	(975,453)	24,168,948
2033	24,168,948	1,256,177	(732,128)	24,692,997
2034	24,692,997	1,069,338	(512,162)	25,250,173
2035	25,250,173	898,695	(312,027)	25,836,840
2036	25,836,840	752,940	(134,219)	26,455,562
2037	26,455,562	622,949	864	27,079,375
2038	27,079,375	508,503	6	27,587,883
2039	27,587,883	407,300	0	27,995,183
2040	27,995,183	317,856	0	28,313,039
2041	28,313,039	242,249	0	28,555,288
2042	28,555,288	180,316	0	28,735,604
2043	28,735,604	130,490	0	28,866,094
2044	28,866,094	95,825	0	28,961,919
2045	28,961,919	69,245	0	29,031,164
2046	29,031,164	48,078	0	29,079,242
2047	29,079,242	32,806	0	29,112,048
2048	29,112,048	22,433	0	29,134,481
2049	29,134,481	15,761	0	29,150,242
2050	29,150,242	10,021	0	29,160,263
2051	29,160,263	6,444	0	29,166,707

Year	RTA Assets Beginning of Year ($)	Contributions to RTA ($)	Transfer To/From RCA ($)	RTA Assets End of Year ($)
2052	29,166,707	4,026	0	29,170,733
2053	29,170,733	2,262	0	29,172,995
2054	29,172,995	1,129	0	29,174,124
2055	29,174,124	474	0	29,174,598
2056	29,174,598	109	0	29,174,707
2057	29,174,707	26	0	29,174,733
2058	29,174,733	15	(29,174,748)	0

Reserve Fund

Year	Reserve Fund at Beginning of Year ($)	Total Contributions ($)	Transfer from RCA/RTA ($)	Total Benefit Payments ($)	Expenses ($)	Investment Income ($)	Reserve Fund at End of Year ($)
2007	27,370,000	2,167,000	0	0	0	252,000	29,789,000
2008	29,789,000	3,364,000	0	0	0	(6,571,000)	26,582,000
2009	26,582,000	3,358,000	0	0	0	4,332,000	34,272,000
2010	34,272,000	3,317,000	0	0	0	3,525,000	41,114,000
2011	41,114,000	4,647,000	0	0	0	241,000	46,002,000
2012	46,002,000	6,552,000	0	0	0	6,328,000	58,882,000
2013	58,882,000	6,827,000	0	0	0	12,256,000	77,965,000
2014	77,965,000	2,187,000	1,450,000	0	0	8,824,000	90,426,000
2015	90,426,000	3,075,000	400,000	0	0	9,508,000	103,409,000
2016	103,409,000	4,086,648	0	0	0	6,327,139	113,822,787
2017	113,822,787	3,436,686	0	0	0	6,932,468	124,191,941
2018	124,191,941	3,303,793	0	0	0	7,550,630	135,046,365
2019	135,046,365	3,154,497	0	0	0	8,197,417	146,398,279
2020	146,398,279	3,004,436	0	0	0	8,874,030	158,276,745
2021	158,276,745	2,865,270	0	0	0	9,582,563	170,724,578
2022	170,724,578	2,717,582	0	0	0	10,325,002	183,767,162
2023	183,767,162	2,563,932	0	0	0	11,102,948	197,434,042
2024	197,434,042	2,406,600	0	0	0	11,918,241	211,758,883
2025	211,758,883	2,247,320	0	0	0	12,772,953	226,779,156
2026	226,779,156	2,084,916	0	1,378,274	0	13,627,949	241,113,748
2027	241,113,748	1,922,351	0	7,035,005	0	14,313,445	250,314,539
2028	250,314,539	1,762,300	0	10,584,733	0	14,754,199	256,246,305
2029	256,246,305	1,600,787	0	13,073,865	0	15,030,586	259,803,814
2030	259,803,814	1,438,452	0	15,018,964	0	15,180,813	261,404,114
2031	261,404,114	1,277,114	0	16,654,389	0	15,222,929	261,249,768
2032	261,249,768	1,120,792	0	18,086,253	0	15,166,022	259,450,330
2033	259,450,330	971,574	0	19,349,856	0	15,015,671	256,087,719
2034	256,087,719	827,066	0	20,438,537	0	14,776,919	251,253,167
2035	251,253,167	695,084	0	21,381,026	0	14,454,612	245,021,837
2036	245,021,837	582,352	0	22,174,315	0	14,053,551	237,483,425
2037	237,483,425	481,812	0	22,770,133	47,505	13,578,931	228,726,530
2038	228,726,530	393,295	0	22,948,907	308,992	13,037,654	218,899,581
2039	218,899,581	315,021	0	22,996,883	420,874	12,440,893	208,237,738
2040	208,237,738	245,842	0	22,920,965	507,589	11,798,783	196,853,809
2041	196,853,809	187,364	0	22,725,159	576,145	11,117,810	184,857,679
2042	184,857,679	139,463	0	22,425,382	627,282	10,404,065	172,348,544
2043	172,348,544	100,926	0	22,015,026	662,330	9,663,620	159,435,733
2044	159,435,733	74,115	0	21,493,656	678,219	8,903,211	146,241,184
2045	146,241,184	53,557	0	20,882,740	682,798	8,129,112	132,858,315
2046	132,858,315	37,185	0	20,199,937	679,375	7,346,235	119,362,423
2047	119,362,423	25,373	0	19,440,486	667,297	6,559,273	105,839,286
2048	105,839,286	17,351	0	18,622,912	648,227	5,772,744	92,358,242
2049	92,358,242	12,190	0	17,754,418	623,622	4,990,519	78,982,911
2050	78,982,911	7,751	0	16,855,537	596,991	4,215,631	65,753,765
2051	65,753,765	4,984	0	15,926,055	567,095	3,450,581	52,716,180

Year	Reserve Fund at Beginning of Year ($)	Total Contributions ($)	Transfer from RCA/RTA ($)	Total Benefit Payments ($)	Expenses ($)	Investment Income ($)	Reserve Fund at End of Year ($)
2052	52,716,180	3,114	0	14,979,780	535,435	2,697,608	39,901,687
2053	39,901,687	1,750	0	14,024,990	502,815	1,958,320	27,333,951
2054	27,333,951	873	0	13,068,224	469,492	1,233,932	15,031,040
2055	15,031,040	367	0	12,117,816	435,920	525,261	3,002,932
2056	3,002,932	84	0	11,180,267	402,521	(167,305)	(8,747,077)
2057	(8,747,077)	20	0	10,261,547	369,519	(843,756)	(20,221,879)
2058	(20,221,879)	12	29,174,748	9,367,578	337,336	(1,504,460)	(2,256,493)
2059	(2,256,493)	0	0	8,503,208	306,223	(399,672)	(11,465,596)
2060	(11,465,596)	0	0	7,672,723	276,315	(926,407)	(20,341,041)
2061	(20,341,041)	0	0	6,880,025	247,768	(1,434,296)	(28,903,130)
2062	(28,903,130)	0	0	6,128,477	220,703	(1,924,663)	(37,176,973)
2063	(37,176,973)	0	0	5,420,519	195,208	(2,399,090)	(45,191,790)
2064	(45,191,790)	0	0	4,757,718	171,339	(2,859,379)	(52,980,226)
2065	(52,980,226)	0	0	4,141,176	149,136	(3,307,523)	(60,578,061)
2066	(60,578,061)	0	0	3,571,450	128,618	(3,745,686)	(68,023,815)
2067	(68,023,815)	0	0	3,081,141	110,961	(4,177,192)	(75,393,109)
2068	(75,393,109)	0	0	2,658,932	95,756	(4,606,227)	(82,754,024)
2069	(82,754,024)	0	0	2,295,175	82,656	(5,036,576)	(90,168,431)
2070	(90,168,431)	0	0	1,981,637	71,365	(5,471,696)	(97,693,129)
2071	(97,693,129)	0	0	1,711,275	61,628	(5,914,775)	(105,380,807)
2072	(105,380,807)	0	0	1,478,062	53,229	(6,368,787)	(113,280,885)
2073	(113,280,885)	0	0	1,276,831	45,982	(6,836,538)	(121,440,237)
2074	(121,440,237)	0	0	1,103,149	39,727	(7,320,701)	(129,903,814)
2075	(129,903,814)	0	0	953,208	34,327	(7,823,855)	(138,715,205)
2076	(138,715,205)	0	0	823,736	29,664	(8,348,514)	(147,917,119)
2077	(147,917,119)	0	0	711,917	25,637	(8,897,154)	(157,551,827)
2078	(157,551,827)	0	0	615,329	22,159	(9,472,234)	(167,661,550)
2079	(167,661,550)	0	0	531,885	19,154	(10,076,224)	(178,288,813)
2080	(178,288,813)	0	0	459,787	16,558	(10,711,619)	(189,476,777)
2081	(189,476,777)	0	0	397,485	14,314	(11,380,961)	(201,269,537)
2082	(201,269,537)	0	0	343,643	12,375	(12,086,853)	(213,712,408)
2083	(213,712,408)	0	0	297,108	10,699	(12,831,979)	(226,852,195)
2084	(226,852,195)	0	0	256,886	9,251	(13,619,116)	(240,737,447)
2085	(240,737,447)	0	0	222,116	7,999	(14,451,150)	(255,418,713)
2086	(255,418,713)	0	0	192,060	6,917	(15,331,092)	(270,948,782)
2087	(270,948,782)	0	0	166,075	5,981	(16,262,089)	(287,382,926)
2088	(287,382,926)	0	0	143,610	5,172	(17,247,439)	(304,779,147)
2089	(304,779,147)	0	0	124,186	4,472	(18,290,609)	(323,198,414)
2090	(323,198,414)	0	0	107,392	3,867	(19,395,243)	(342,704,917)
2091	(342,704,917)	0	0	92,871	3,344	(20,565,181)	(363,366,313)
2092	(363,366,313)	0	0	80,315	2,892	(21,804,475)	(385,253,994)
2093	(385,253,994)	0	0	69,457	2,501	(23,117,398)	(408,443,350)
2094	(408,443,350)	0	0	60,068	2,163	(24,508,468)	(433,014,050)
2095	(433,014,050)	0	0	51,949	1,871	(25,982,458)	(459,050,328)
2096	(459,050,328)	0	0	44,928	1,618	(27,544,416)	(486,641,290)
2097	(486,641,290)	0	0	38,856	1,399	(29,199,685)	(515,881,231)
2098	(515,881,231)	0	0	33,606	1,210	(30,953,918)	(546,869,964)

Year	Reserve Fund at Beginning of Year ($)	Total Contributions ($)	Transfer from RCA/RTA ($)	Total Benefit Payments ($)	Expenses ($)	Investment Income ($)	Reserve Fund at End of Year ($)
2099	(546,869,964)	0	0	29,064	1,046	(32,813,101)	(579,713,176)
2100	(579,713,176)	0	0	25,137	905	(34,783,572)	(614,522,790)

Required Contributions

Effective January 1, 2014, members are required to contribute 12.80% of their excess earnings for each year of service under the Income Tax Act. Employers make matching contributions. Half of these contributions are deposited in the RCA Fund. The other half are forwarded to Canada Revenue Agency and held in the Refundable Tax Account.

Employers are required to make additional contributions to the Reserve Fund. The Reserve Fund was established to meet the liability of the Plan not covered by assets in the RCA Fund and the RTA. Based on the December 31, 2012 actuarial valuation, contributions were set at 9.9% (effective April 1, 2015) of excess earnings.

The recommended employer contribution rate for the Reserve Fund based on this valuation is 11.6% of excess earnings, to be effective April 1, 2017. This assumes the member contribution rate and the matching employer contribution rate to the RCA Fund/RTA will remain at 12.80% of excess earnings indefinitely.

The established employer contribution rate for the Reserve Fund of 9.9% of earnings is insufficient to meet the obligations of the current Plan members. Without a future increase to contribution rates, or actuarial experience gains, the fund is expected to be depleted of funds by 2056.

Section 4: Actuarial Certificate

Actuarial Opinion, Advice and Certification for the Supplementary Retirement Plan for Public Service Managers

Opinion

This actuarial certification forms an integral part of the actuarial valuation report for the Plan as at December 31, 2015. We confirm that we have prepared an actuarial valuation of the Plan as at December 31, 2015 for the purposes outlined in the Introduction section to this report and consequently:

Our advice on funding is the following:

- Contributions in the amounts as outlined in Section 3 of this report are required to fund the Plan in accordance with the assumptions and methods set out in this report. The current contribution rates are insufficient to meet the funding requirements established.
- The next actuarial valuation for the purpose of developing funding requirements should be performed no later than as at December 31, 2018.

We hereby certify that, in our opinion:

- With respect to the purposes of determining the Plan's financial position as at December 31, 2015:
  - The Plan has an unfunded liability of $53,310,000 as at December 31, 2015, based on total assets of $158,820,000 less total liability of $212,130,000.
- With respect to determining the funding requirements of the Plan:
  - Required member and matching employer contributions to the RCA Fund and Refundable Tax Account for the period following the valuation date are 12.80% of excess earnings. Additional employer contributions are 11.6% of excess earnings to the Reserve Fund effective April 1, 2017. The current contribution rate of 9.9% is not expected to meet the Plan’s obligations.
  - The contribution as outlined in this report is expected to be sufficient to satisfy the Plan's funding requirements.
- For the purposes of the valuation:
  - The data on which this valuation is based are sufficient and reliable;
  - The assumptions used are appropriate; and
  - The actuarial cost methods and the asset valuation methods used are appropriate.

- This report and its associated work have been prepared, and our opinion given, in accordance with accepted actuarial practice in Canada and in compliance with the requirements outlined in subparagraphs 147.2(2)(a)(iii) and (iv) of the *Income Tax Act*.
- Notwithstanding the above certifications, emerging experience differing from the assumptions will result in gains or losses that will be revealed in subsequent valuations.

Original Signed

Robert J. Thiessen, FCIA, FSA
Associate Partner

Original Signed

John Slipp, FCIA, FSA
Associate Partner

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March 13, 2017

Appendix A: Glossary of Terms

- The **actuarial excess/(unfunded liability)** is the difference between the actuarial value of assets and the going concern liabilities.
- The **actuarial liabilities** are the actuarial present value of benefits earned in respect of service prior to the valuation date. The actuarial liabilities are calculated using the actuarial assumptions and methods summarized in Appendix D of this report.
- The **actuarial value of assets** is the asset value used for going concern valuation purposes. Smoothing methods are sometimes used to smooth investment gains and losses over a certain period.
- **Excess earnings** are the regular earnings in excess of the maximum earnings level as determined from the maximum defined benefit pension limit for each year of service under the Income Tax Act. The maximum earnings level is $144,500 in 2016 ($138,500 in 2014).
- The **Retirement Compensation Arrangement (RCA)** is an approved means of providing a supplementary pension on salary above the Income Tax Act cap. The Income Tax Act requires that 50% of all contributions, investment income and realized capital gains within the RCA Fund be remitted annually to Canada Revenue Agency.
- The **RCA Fund** receives half of the required contributions from participating employees and participating employers. Contributions to the RCA fund from participating employers match the contributions made by the participating employees. The other half of the required contributions are remitted annually to the RTA.
- 50% of all contributions, investment income and realized capital gains within the RCA Fund are remitted annually to the **Refundable Tax Account (RTA)**, held by Canada Revenue Agency. This tax held by Canada Revenue Agency does not accrue interest and is refunded upon the payment of benefits and administrative expenses from the RCA Fund.
- The **Reserve Fund** collects additional contributions from participating employers which are invested and required to meet future benefit payments of the Plan as determined by the actuary. Reserve Fund investment earnings are not taxable.

Appendix B: Assets

Asset Data

Employee contributions and matching employer contributions to the Plan are deposited into the Retirement Compensation Arrangement (RCA) trust fund. Half of these contributions are forwarded to the Canada Revenue Agency (CRA) to be held in a Refundable Tax Account (RTA). Employers also make additional contributions which are held in the government's Reserve Fund.

The assets in the RCA are invested. However, 50% of the realized investment income each year must be remitted to the RTA. This is offset by 50% of any benefits paid by the RCA. The amounts held in the RTA receive no investment income. The assets in the Reserve Fund are invested and no tax is paid on the investment income.

The assets in the RCA and the Reserve Fund are invested in a diversified portfolio in accordance with the Plan's Statement of Investment Policies and Procedures.

Tests of the sufficiency and reliability of the asset data were performed and the results were satisfactory. The tests included:

- A reconciliation of actual cash flow with expected cash flow from the previous actuarial report; and
- A reconciliation of any anticipated benefit payments in 2013, 2014, and 2015 (for retirees, terminated or deceased employees) against the financial statements of the pension fund for confirmation of payments.

Current Asset Mix

The following is a summary of the composition of the Plan's assets (excluding the RTA) by asset type as reported by Alberta Treasury Board and Finance as at December 31, 2015. For comparison purposes, the composition at the previous valuation date of December 31, 2012 is also shown.

	December 31, 2015	December 31, 2012
Cash and short term	1.8%	1.7%
Bonds and mortgages	31.2%	31.4%
Canadian equities	13.2%	14.0%
Foreign equities	33.5%	38.9%
Private equities	2.5%	2.3%
Real return bonds	0.7%	4.2%
Real estate	10.4%	3.4%
Infrastructure and private debt	4.1%	3.3%
Timberland	0.8%	0.8%
Strategic opportunities	1.8%	0.0%
Total	**100.0%**	**100.0%**

Target Asset Mix

The target asset mix of the Plan is contained in the Plan's Statement of Investment Policies and Procedures and is as follows:

	Minimum	Target	Maximum
Money Market and Fixed Income	**25.0%**	**32.0%**	**45.0%**
Cash and money market	0.0%	0.5%	5.0%
Fixed income (bonds and mortgages)	25.0%	31.5%	40.0%
Equity	**35.0%**	**48.0%**	**60.0%**
Canadian equities	10.0%	14.0%	20.0%
Global equities	25.0%	34.0%	40.0%
Private equity	0.0%	0.0%	5.0%
Hedge funds	0.0%	0.0%	5.0%
Inflation Sensitive and Alternative	**15.0%**	**20.0%**	**30.0%**
Real estate	10.0%	10.5%	15.0%
Infrastructure	5.0%	7.5%	15.0%
Real return bonds	0.0%	0.0%	5.0%
Private debt	0.0%	0.0%	5.0%
Timberlands	0.0%	2.0%	5.0%
	100.0%	**100.0%**	**100.0%**

The long-term target asset mix applies to the assets held in the RCA Fund and the Reserve Fund. The assets held in the RTA are not covered in the Plan’s Statement of Investment Policies and Procedures. The assets invested in the RCA Fund are different from the assets invested in the Reserve Fund. The RCA Fund is invested primarily in fixed income (close to 83%) with the remainder invested in real return bonds (close to 13%) and cash/money market (approximately 4%). The Reserve Fund has a greater portion of investments in equities (close to 70%), with the remainder of assets invested in fixed income (close to 18%) and inflation sensitive and alternative investments (approximately 12%).

Reconciliation of Changes in Market Value of Assets

The table below reconciles changes in the market value of assets between December 31, 2012 and December 31, 2015.

RCA Fund

	2013	2014	2015
Market Value of Assets, Beginning of Plan Year	**$ 19,200,000**	**$ 19,040,000**	**$ 20,618,000**
Contributions During Plan Year	**$ 3,335,000**	**$ 3,981,000**	**$ 5,282,000**
Benefit Payments During Plan Year			
Non-retired members[1]	$ (680,000)	$ (817,000)	$ (641,000)
Retired members	(2,956,000)	(3,450,000)	(4,182,000)
Total	**$ (3,636,000)**	**$ (4,267,000)**	**$ (4,823,000)**
Transfers During Plan Year			
Transfer from RTA	$ 1,020,000	$ 1,985,000	$ 1,147,000
Transfer to Reserve Fund	0	(1,450,000)	(400,000)
Total	**$ 1,020,000**	**$ 535,000**	**$ 747,000**
Fees/Expenses			
Investment fees/expenses	$ (46,000)	$ (52,000)	$ (53,000)
Non-investment fees/expenses	(549,000)	(592,000)	(622,000)
Total	**$ (595,000)**	**$ (644,000)**	**$ (675,000)**
Investment Income	**$ (284,000)**	**$ 1,973,000**	**$ 864,000**
Market Value of Assets, End of Plan Year	**$ 19,040,000**	**$ 20,618,000**	**$ 22,013,000**
Rate of return, net of investment fees/expenses	-1.7%	10.2%	3.9%

[1] Includes members who have terminated employment or died

RTA Fund

	2013	2014	2015
Market Value of Assets, Beginning of Plan Year	**$ 25,241,000**	**$ 27,555,000**	**$ 29,521,000**
Contributions During Plan Year	**$ 3,334,000**	**$ 3,951,000**	**$ 5,024,000**
Transfers During Plan Year			
Transfer to RCA	$ (1,020,000)	$ (1,985,000)	$ (1,147,000)
Total	**$ (1,020,000)**	**$ (1,985,000)**	**$ (1,147,000)**
Market Value of Assets, End of Plan Year	**$ 27,555,000**	**$ 29,521,000**	**$ 33,398,000**

Reserve Fund

	2013	2014	2015
Market Value of Assets, Beginning of Plan Year	**$ 58,882,000**	**$ 77,965,000**	**$ 90,426,000**
Contributions During Plan Year			
Employer	$ 6,827,000	$ 2,187,000	$ 3,075,000
Total	**$ 6,827,000**	**$ 2,187,000**	**$ 3,075,000**
Transfers During Plan Year			
Transfer from RCA	$ 0	$ 1,450,000	$ 400,000
Total	**$ 0**	**$ 1,450,000**	**$ 400,000**
Investment Income	**$ 12,256,000**	**$ 8,824,000**	**$ 9,508,000**
Market Value of Assets, End of Plan Year	**$ 77,965,000**	**$ 90,426,000**	**$ 103,409,000**

Total Market Value of Assets

	December 31, 2012	December 31, 2015
Market Value of Assets, Beginning of Plan Year	$ 19,200,000	$ 22,013,000
Total	25,241,000	33,398,000
Total	58,882,000	103,409,000
Total Fund	**$ 103,323,000**	**$ 158,820,000**

Appendix C: Membership Data

Source of Data

This funding valuation was based on member data provided by APS as of December 31, 2015. Tests of the sufficiency and reliability of the member data were performed and the results were satisfactory. The tests included:

- A reconciliation of membership status against the membership status at the last valuation. This test was performed to ensure that all members were accounted for. A summary of this reconciliation follows on the next page;
- A reconciliation of birth, hire, and participation dates against the corresponding dates provided for the last valuation to ensure consistency of data;
- A reconciliation of credited service against the corresponding amount provided for the last valuation to ensure that no member accrued more than 3 years of credited service from December 31, 2012, notwithstanding increases due to service purchases during the inter-valuation period. This test also revealed any members who had any unexpected changes in service, such as having accrued less than 3 years of credited service or had no change in credited service;
- A reconciliation of pensionable earnings against the corresponding amounts provided for the last valuation to identify any unusual increases or decreases (more than 15% per year);
- A reconciliation of accrued benefits against the corresponding amounts provided for the last valuation to identify any unusual benefit accruals;
- A reconciliation of any stated benefit payments in 2013, 2014, and 2015 (for retired, terminated or deceased employees) against the financial statements of the pension fund for confirmation of the payments; and
- A reconciliation of inactive member benefit amounts against the corresponding amounts provided for the last valuation to ensure consistency of data.

The following information was missing, and assumptions were made as follows with respect to such missing data:

- Annualization of Pensionable Earnings: Since the data provided by APS did not include annualized earnings for some members, earnings were annualized using actual earnings and in-year service where required.
- Earnings: If earnings were available for 2010 to 2014, the most recent data was utilized and increased to 2015 using the salary increase assumptions from the previous valuation. Otherwise, the overall average of the group was utilized.
- Service: We assumed that service would start from the date of commencement of contributions in to the Plan.

A copy of the administrator certification certifying the accuracy and completeness of the member data (and the plan provisions summarized in this report) is included in Appendix F of this report.

Membership Summary

The table below reconciles the number of members as of December 31, 2015 with the number of members as of December 31, 2012 and the changes due to experience in the period.

	Actives	Potential Active*	Pending	Deferred	HOD	Retired & Survivors	Total
Members, December 31, 2012	**1,073**	**546**	**0**	**82**	**46**	**691**	**2,438**
Changes due to:							
New entrants	120	602	0	0	0	0	722
Return to active	4	2	(2)	(4)	0	0	0
Termination							
Non-vested	(22)	(7)	(1)	0	30	0	0
Deferred vested	(52)	(8)	(2)	62	0	0	0
Lump sum	(29)	(2)	(1)	(4)	(5)	0	(41)
Death							
No further benefits	0	0	0	0	0	(2)	(2)
Lump sum	(3)	(1)	0	0	0	0	(4)
Surviving beneficiary	(1)	0	0	0	0	(31)	(32)
New beneficiary	0	0	0	0	0	32	32
Retirement	(186)	(11)	(6)	(17)	0	220	0
Transfer							
From Potential	0	0	0	0	0	0	0
From Unexpected	251	0	0	0	0	0	251
To Ineligible	(37)	(83)	0	(4)	0	0	(124)
To Pending	0	0	0	0	0	0	0
To Potential	(32)	32	0	0	0	0	0
To Unexpected	0	(191)	0	0	0	0	(191)
Data correction	0	0	31	(11)	11	0	31
Net change	13	333	19	22	36	219	642
Members, December 31, 2015	**1,086**	**879**	**19**	**104**	**82**	**910**	**3,080**

* *A potential active member is one who, as of December 31, 2015, is a member of the Management Employees Pension Plan, and is not a member of the Plan, but is expected to become a member, and whose earnings are currently less than the maximum earnings limit under the MEPP.*

Active Members

	December 31, 2015	December 31, 2012
Number	1,086	1,073
Average age	51.4	52.2
Average service	9.7	9.1
Average pensionable earnings	$ 184,313	$ 157,619
Proportion of female	42.8%	39.0%

Potential Active Members

	December 31, 2015	December 31, 2012
Number	879	546
Average age	45.0	39.5
Average pensionable earnings	$ 137,497	$ 117,690
Proportion of female	50.9%	49.1%

Pending Members

	December 31, 2015	December 31, 2012
Number	19	31
Average age	53.1	51.8
Average amount pending	$ 28,739	$ 23,061
Proportion of female	15.8%	32.3%

Deferred Vested Members

	December 31, 2015	December 31, 2012
Number	104	82
Average age	52.0	52.2
Average annual pension	$ 4,447	$ 3,627
Proportion of female	44.2%	40.2%

Hold on Deposit Members

	December 31, 2015	December 31, 2012
Number	82	46
Average age	52.3	51.7
Average amount owing	$ 6,283	$ 3,442
Proportion of female	36.6%	26.1%

Retired Members and Survivors

	December 31, 2015	December 31, 2012
Number	910	691
Average age	66.0	64.3
Average annual pension	$ 4,911	$ 3,688
Proportion of female	28.1%	24.0%

Active Membership Distribution

The following table provides a detailed summary of the active membership at the valuation date by years of credited service and by age group.

Age		**< 5**	**5–10**	**10–15**	**15–20**	**Total**
< 30	Count	0	0	0	0	0
	Average Earnings	N/A	N/A	N/A	N/A	N/A
30–35	Count	3	1	0	0	4
	Average Earnings	*	*	N/A	N/A	$ 157,737
35–40	Count	26	35	7	1	69
	Average Earnings	$ 165,402	*	$ 172,454	*	$ 166,697
40–45	Count	51	84	53	5	193
	Average Earnings	$ 171,762	$ 174,342	$ 183,047	$ 215,554	$ 177,118
45–50	Count	42	75	47	35	199
	Average Earnings	$ 188,060	$ 177,806	$ 181,249	$ 186,742	$ 182,355
50–55	Count	55	57	64	77	253
	Average Earnings	$ 190,460	$ 184,510	$ 183,900	$ 196,723	$ 189,366
55–60	Count	35	40	39	79	193
	Average Earnings	$ 181,642	$ 190,310	$ 188,186	$ 191,044	$ 188,610
60–65	Count	20	34	35	53	142
	Average Earnings	$ 185,007	$ 190,225	$ 182,225	$ 189,521	$ 187,255
>=65	Count	5	8	9	11	33
	Average Earnings	*	$ 193,818	$ 182,962	*	$ 201,708
Total Count		**237**	**334**	**254**	**261**	**1,086**
Average Earnings		**$ 181,662**	**$ 180,010**	**$ 183,310**	**$ 193,200**	**$ 184,313**

** Not shown for confidentiality reasons to comply with privacy legislation.*

Retired/Deferred Vested Membership Distribution

The following table provides a detailed summary of the retired/deferred vested membership at the valuation date by age group.

Age		**Retired Members and Beneficiaries**	**Deferred Vested Members**	**Total**
< 50	Count	0	33	33
	Average lifetime pension	N/A	$ 3,494	$ 3,494
50–55	Count	4	37	41
	Average lifetime pension	$ 5,273	$ 5,766	$ 5,717
55–60	Count	100	27	127
	Average lifetime pension	$ 8,413	$ 4,413	$ 7,563
60–65	Count	256	7	263
	Average lifetime pension	$ 5,874	$ 2,107	$ 5,774
65–70	Count	382	0	382
	Average lifetime pension	$ 4,282	N/A	$ 4,282
70–75	Count	135	0	135
	Average lifetime pension	$ 2,932	N/A	$ 2,932
75–80	Count	28	0	28
	Average lifetime pension	$ 2,380	N/A	$ 2,380
>=80	Count	5	0	5
	Average lifetime pension	$ 817	N/A	$ 817
Total Count		**910**	**104**	**1,014**
Average annual lifetime pension		**$ 4,911**	**$ 4,447**	**$ 4,863**

Appendix D: Actuarial Assumptions and Methods

Assumptions and Methods

A member's entitlements under a pension plan are generally funded during the period over which service is accrued by the member. The cost of each member's benefits is allocated in some fashion over the member's service. An actuarial valuation provides an assessment of the extent to which allocations relating to periods prior to a valuation date (often referred to as the actuarial liabilities) are covered by the plan's assets.

The going concern valuation provides an assessment of a pension plan on the premise that the plan continues on into the future indefinitely based on assumptions in respect of future events upon which a plan's benefits are contingent and methods that effectively determine the way in which a plan's costs will be allocated over the members' service. The true cost of a plan, however, will emerge only as experience develops, investment earnings are received, and benefit payments are made.

This appendix summarizes the going concern assumptions and methods that have been used for the going concern valuation of the Plan at the valuation date. The going concern assumptions and methods have been chosen to reflect our understanding of the Plan's funding objectives with due respect to accepted actuarial practice. For purposes of this valuation, the going concern methods and assumptions were reviewed and changes as indicated were made.

The actuarial assumptions and methods used in the current and previous valuations are summarized below and described on the following pages.

	December 31, 2015	December 31, 2012
Economic Assumptions		
Asset rate of return	RCA Fund 2.50% Reserve Fund 6.0%	RCA Fund 2.50% Reserve Fund 6.25%
Discount rate	4.0% per year	4.1% per year
Inflation rate	2.0% per year	2.25% per year
Increases in pensionable earnings – Base	0.0% for 2016, 0.0% for 2017, then 2.75% per year thereafter	0.0% for 2013, 2.0% for 2014, 2.25% for 2015, 2.5% for 2016, then 3.0% per year thereafter
Increases in maximum pension limit	In accordance with *Income Tax Act*, then 2.75% per year	In accordance with *Income Tax Act*, then 3.0% per year
Interest on member contributions	Inflation plus 2.0% per year (4.0% per year)	Inflation plus 2.0% per year (4.25% per year)
Investment expenses	0.40% per year (taken into account in the asset rate of return assumption)	Same
Non-investment expenses	Increase at 60% of Alberta CPI until 2039, proportion to benefits paid thereafter	Increase at 60% of Alberta CPI until 2036, proportion to benefits paid thereafter
Margin for adverse deviation	0.33%/0.42% (in discount rate)	0.93%/0.98% (in discount rate)
Demographic Assumptions		
Increases in pensionable earnings – Merit and Promotion	0.8% per year	1.3% per year
Mortality table	CPM2014Publ with generational improvements using Scale CPMB2D2014 (sex-distinct rates)	UP94 Mortality Table with generational improvements using Scale AA (sex-distinct rates)
Retirement rates	Rates following 2016 experience study for MEPP (Table A following)	Rates following 2012 experience study for MEPP
Termination rates	Rates following 2016 experience study for MEPP (Table B following)	Rates following 2012 experience study for MEPP
Disability rates	None	Same
Proportion married		
Non-retired proportion with pension partner	80%	90%
Non-retired pension partner age differential	Males three years older	Same
Retired members	Actual marital status and ages are used	Same

	December 31, 2015	December 31, 2012
Deferred pension take-up	100%	Same
Margin for adverse deviation	Included above	Same
Other		
Contribution rate to RCA/RTA	12.80%	11.16% (2013) 12.80% (2014 and thereafter)
Contribution rate to Reserve Fund	9.9%	22.6% (January 1, 2013 to March 31, 2014) 2.4% (April 1, 2014 to March 31, 2015) 9.9% (April 1, 2015)
Methods		
Actuarial cost method – Liability	Projected accrued benefit	Same
Actuarial cost method – Contribution	Forecast with closed group	Same
Asset valuation method	Market value of assets	Same

Table A – Retirement Rates

Age-based retirement rates are in accordance with the following table:

Age	Rate (%)	
	Not Eligible for an Unreduced Pension	Eligible for an Unreduced Pension
55	7.0	20.0
56 – 58	6.0	16.0
59	12.0	16.0
60 – 63		18.0
64		25.0
65		35.0
66 – 69		30.0
70		50.0
71		100.0

Table B—Termination Rates

Age-based termination rates are in accordance with the following table:

Age	Rate (%)
Under 36	10.0
36 – 39	8.0
40 – 50	6.0
51 – 53	5.0
54	8.0

Justification of Actuarial Assumptions and Methods

Economic Assumptions

Asset Rate of Return

We have used an asset rate of return of 2.50% per year for the RCA fund and 6.0% per year for the Reserve Fund.

The overall expected return ("best-estimate") for the RCA Fund is 2.90% per year and for the Reserve Fund is 6.48% per year. These best estimate returns are based on an inflation rate of 2.0% per year. These overall expected returns were developed using best-estimate returns for each major asset class in which the funds are invested. A Monte Carlo simulation is performed where the portfolio returns are projected assuming annual rebalancing. Expected plan cash flows are projected reflecting the plan's time horizon and discounted using the simulated returns. The internal rate of return is then calculated for each scenario and the average is used to develop an overall best-estimate rate of return for each fund. Gains from rebalancing and diversification are implicit to this return.

The above determined rate of returns has been established based on the Company's investment policy and its funding policy (whether formal or informal) and objectives. There may be some barriers to achieving these returns such as inflation higher than expected, asset returns lower than expected, and assets and liabilities that are mismatched. The following charts lay out the adjustments that have been made to the overall expected rate of return for each fund:

Development of Asset Rate of Return for Reserve Fund

Overall expected return				6.48%
Investment expenses				
Passive	(1)	(0.06)%		
Actively managed	(2)	(0.34)%		
			(1)+(2)	(0.40)%
Additional returns due to active management				0.34%
Margin for adverse deviations				(0.42)%
Asset Rate of Return				**6.00%**

Development of Asset Rate of Return for RCA Fund

Overall expected return				2.90%
Investment expenses				
Passive	(1)	(0.07)%		
Actively managed	(2)	(0.33)%		
			(1)+(2)	(0.40)%
Additional returns due to active management				0.33%
Margin for adverse deviations				(0.33)%
Asset Rate of Return				**2.50%**

Discount Rate

The discount rate used to determine the actuarial liability is assumed to be 4.0% per year. The rate was derived from the total fund (RCA, RTA, and Reserve Fund) net asset rate of return and included a margin for adverse deviation of 0.48%. The discount rate aligns with the discount rate used for Section 4600 reporting purposes as at December 31, 2015 and reflects the taxation implications of the RCA. For the previous valuation, the discount rate was 4.1% per year.

Inflation Rate

The inflation rate is assumed to be 2.0% per year. This reflects our best estimate of future inflation considering current economic and financial market conditions. For the previous valuation, the inflation rate was assumed be 2.25% per year.

Increases in Pensionable Earnings

We have assumed future base rate salary increases will not increase for two years from the valuation date, and then increase at an assumed rate of inflation of 2.0% per year plus an allowance of 0.75% per year for the effect of productivity growth (or 0.0% per year for two years and 2.75% per year thereafter). For the previous valuation, it was assumed that future base rate salary increases would not increase for one year from the valuation date and then increase at 2.0% for 2014, 2.25% for 2015, 2.5% for 2016, and then increase at the rate of inflation of 2.25% per year plus 0.75% per year for productivity growth thereafter. The current and previous assumptions both reflect actual anticipated short-term salary experience. The current ultimate assumption was adopted to better reflect historic levels of real wage growth.

In addition to the base rate, we assume rates of increase as a result of individual employee merit and promotion of 0.8% per year. The merit and promotion scale is based on the 2016 experience study for MEPP over the years of 2006-2015 and Committee input. For the previous valuation, it was assumed that members would receive a merit and promotional increase of 1.3% per year, based on the results of the 2012 experience study for MEPP.

Increases in the Maximum Pension Limit

According to the terms of the Plan, pensionable earnings for service on and after January 1, 1992, are limited to the earnings upon which a maximum pension can be earned in each year. That is, maximum pensionable earnings are equal to the maximum annual pension payable for each year of service divided by 2%. Maximum pensionable earnings are in accordance with the Income Tax Act.

Pensions are limited to the maximum limits under the *Income Tax Act*. The maximum lifetime annual pension per year of pensionable service payable under the *Income Tax Act* is $2,890.00 in 2016. It is assumed that the maximum limit will increase at 2.75% per year commencing in 2017. This is comprised of an annual increase of 2.0% on account of inflation, plus 0.75% on account of productivity, which is consistent with historical real economic growth. For the previous valuation, we assumed the rate of increase of the limit to be 3.0% per year.

Interest on Member Contributions

Interest is credited on member contributions with the rate credited by chartered banks on five-year personal fixed term deposits which we have assumed at a rate of 4.0% per year. The assumption reflects an assumed rate of future inflation plus 2.0% per year, which is consistent with historical rates. This assumption has not changed from the previous valuation.

Expenses

Administrative expenses are assessed to the Plan as a charge on a per member basis. The total administrative expenses assessed for 2015 amounted to $622,000. It was assumed that expenses will increase each year in absolute dollar terms at 60% of the assumed rate of increase in the Consumer Price Index for Alberta until 2039. Each year thereafter, expenses are assumed to be proportional to benefits paid (3.60% of the total benefit payments). The previous valuation assumed expenses would increase at 60% of the assumed rate of increase in the Consumer Price Index for Alberta until 2036 and then be proportional to benefits paid (6.46% of total benefit payments).

Economic Margins for Adverse Deviations

Margins for conservatism or provisions for adverse deviation have been built into the going concern assumptions where appropriate.

The margins have been chosen so as to balance the need for financial security for existing Plan members against overly conservative contribution requirements that potentially result in intergenerational inequity among members and unnecessary financial strain on the Plan sponsor.

Margins for adverse deviations of 0.58% (RCA Fund) and 0.62% (Reserve Fund) have been reflected in the asset rate of return assumption and 0.48% in the discount rate.

The actuary has discussed the Plan's experience with the Committee and compared it to the expected experience. This review indicates that there is a need for use of margins for adverse deviations. The margins for adverse deviations incorporated in the assumptions reflect this review and the Committee's desire to maintain safety cushions. The actuary has discussed with the Committee the implications of incorporating margins for adverse deviations and the Committee is fully cognizant and supports incorporating margins for adverse deviations.

Demographic Assumptions

Mortality

The Canadian Institute of Actuaries has completed a study of Canadian pensioner mortality levels and trends. Some conclusions of the study are:

- the UP94 mortality table together with generational improvements using Scale AA overstates average Canadian pensioner mortality rates, and therefore understates expected future pension payments for many plans; and
- more rapid improvements in longevity have been observed than suggested by Improvement Scale AA.

In light of these findings, we have modified the mortality assumptions of the going concern basis and are now using the following table published in the Canadian Institute of Actuaries report: 2014 Canadian Pensioner Mortality Public Table ("CPM2014Publ"), and with mortality improvements in accordance with CPMB2D2014. We have used the CPM2014Publ table with no pension size adjustments factor based on the 2016 experience study for MEPP. For the previous valuation, mortality rates were assumed to be derived from the 1994 Uninsured Pensioner ("UP94") Mortality Table with generational improvements using Scale AA.

Retirement

Retirement rates are typically developed taking into account the past experience of the Plan. Accordingly, the rates of retirement have been developed based on the 2016 experience study for MEPP and are considered best-estimate rates of retirement based on the plan provisions. The rates used in the previous valuation were based on the 2012 experience study for MEPP.

As in the previous valuation, all members in receipt of disability benefits from an employer's approved long-term disability plan are assumed to continue to be disabled until termination or retirement. As such, they are included as active members.

Deferred members are assumed to retire at age 55 or their current age if older.

Termination of Employment

A member's benefit entitlement under the Plan is affected by whether the member terminates employment prior to retirement for reasons other than death. In order to account for this in the calculation of the actuarial liability, an assumption regarding the probability that a member will terminate employment for reasons other than death has been made.

The termination rates were developed based on the 2016 experience study for MEPP and are considered to be best estimate. The rates used in the previous valuation were based on the 2012 experience study for MEPP.

Option Elections on Termination

We have assumed 100% of members will elect a deferred annuity on termination.

Disability

If an active Plan member becomes disabled, contributory service continues to accrue until unreduced pension commencement age, but employee contributions are waived. Since this benefit is substantially the same as the benefit that accrues to an active member, no disability assumption was used. Use of an actual disability assumption in this case would reduce liabilities slightly, so a nil disability incidence assumption represents a small element of conservatism. The disability assumption has very little impact on the valuation results.

Proportion of Members with Pension Partners and Pension Partner Age Differential

These assumptions are relevant to the valuation of benefits since there is a subsidized joint and survivor benefit available for members with a pension partner. The proportion of members who will have a pension partner and the pension partner age difference are based on the 2016 experience study for MEPP.

For retired members, the actual marital status and pension partner age are used.

We assumed that 80% of participants would have a pension partner at the relevant time. We assumed 90% of participants would have a pension partner at the previous valuation, which was based on broad population statistics. All pension partners are assumed to be the opposite gender of the participant. Male partners were assumed to be three years older than their female partners based on an analysis of recent retirements. The remaining 20% of participants were assumed to have no pension partner. While the definition of pension partner includes same-sex relationships, this assumption adequately provides for all such contingencies.

Demographic Margins for Adverse Deviations

All demographic assumptions are considered best estimate so no margins for conservatism or provisions for adverse deviation have been built into the going concern demographic assumptions.

The actuary has discussed the Plan’s experience with the Company and compared it to the expected experience. This review indicates that margins for adverse deviations are not required. The actuary has discussed with the Company the implications of not incorporating margins for adverse deviations and the Company is fully cognizant and supports not incorporating margins for adverse deviations.

Other

Contribution Rates

Contribution rates to the RCA/RTA are 12.80% of excess earnings for 2016 and beyond. Contribution rates to the Reserve Fund are 9.9% of excess earnings.

Methods

Actuarial Cost Method

In order to determine the employer contributions required to be made to the Reserve Fund, a forecast actuarial cost method has been employed. Under this method, projections of the expected future cash flows, expected future earnings of both existing and potential members and expected future investment income for the RCA Fund and the Reserve Fund are determined. A closed group model is used. That is, no new hires are considered to occur. The employer contribution rate is then determined as the constant percentage of excess earnings which will exhaust all the assets at the time the last benefit is expected to be paid.

The RCA Fund receives all required employee contributions and pays all Plan expenses and benefits. At the end of each year, a transfer is made to the RTA in an amount equal to 50% of the difference between net investment income and benefits paid. Administrative expenses cannot be included in this calculation. If this difference is negative, a transfer from the RTA to the RCA Fund is made. The RCA Fund will receive contributions as long as the projections indicate that there are active members. In this projection, the last active member retires in 2058. It is assumed that the RCA Fund will pay all expenses and benefits for as long as it has sufficient funds to do so. In the year in which the RCA Fund can no longer pay all expected expenses and benefits, the shortfall will be paid by the Reserve Fund. Consequently, in this projection, the Reserve Fund commences to pay the balance of the expected benefits in 2026 and all of the expected benefits and the balance of the expected expenses in 2037.

It is assumed that the RCA Fund will be wound-up when the last remaining active member retires. At that time, any remaining assets in the RCA and the entire balance of the RTA is transferred to the Reserve Fund. This occurs at the end of 2058 in this projection. The Reserve Fund is then responsible for the payment of all remaining benefits and expenses. As there are no active members, no further contributions occur.

With respect to the accrued benefit liability, the projected accrued benefit method prorated on service has been used. Under the projected accrued benefit actuarial cost method, the actuarial present value of benefits in respect of service prior to the valuation date, but based on pensionable earnings projected to retirement, is compared with the actuarial asset value, revealing either an actuarial excess or an unfunded actuarial liability.

When calculating the actuarial present value of benefits at the valuation date, the present value of all retirement, withdrawal and pre-retirement death benefits are included. For each member, the retirement, withdrawal and pre-retirement death benefits for a particular period of service are first projected each year into the future taking into account future vesting, early retirement entitlements and minimum pension/value entitlements. These projected benefits for each future year are then capitalized, multiplied by the probability of the member leaving the Plan in that year and discounted with interest and survivorship to the valuation date. The actuarial present value of benefits for the particular period of service is then determined by summing the present values of these projected benefits.

Asset Valuation Method

The actuarial value of assets (AVA) consists of the value of the assets contained in the RCA and the Reserve Fund, determined at market value plus the amount held by the federal government in the RTA. The same methodology was used in the previous valuation.

Other Methodologies

We have prepared a list of additional assumptions and methods used in the valuation of the Plan. This list is intended to assist users of this report in understanding the specific benefits valued. Small differences in methods and assumptions in a plan of this size can sometimes have effects in the millions of dollars. Appendix C of the report deals with data omissions so they will not be repeated here.

- It is administrative practice for the Plan that indexation of deferred and immediate pensions commences January 1 of the year following termination or retirement;
- Contributions are based on earnings in excess of the maximum earnings limit described earlier in this report;
- The excess earnings for calculating the contribution percentage is nil for members with 35 years of combined pensionable service; and
- For deferred benefits on termination, the pensions were deferred to 55 with the early reduction factor calculated from the earlier of age 60 and the attainment of 80 points. Deferred pensioners over age 55 at the valuation date were assumed to retire on July 1, 2016.

Appendix E: Summary of Plan Provisions

This funding valuation was based on plan design information provided by the Committee as of December 31, 2015. The following is a summary of the main provisions of the Plan.

Jurisdiction of Registration	Alberta
Eligibility for Membership	All Alberta government employees who are part of the Management Employees Pension Plan (MEPP) and earn more than the amount as determined from the maximum defined benefit pension limit under the *Income Tax Act* from time to time, are members of the Plan effective July 1, 1999 or the date of participation in MEPP, if later. Agencies, boards and commissions associated with the Alberta government have the option of participating in the Plan, if their employees are contributing members of MEPP and their application is approved by the Minister of Finance.
Normal Retirement	
Eligibility	Age 55 with at least 5 years of combined pensionable service under MEPP.
Benefit	The annual pension payable at retirement is determined as: (a) 2.0% of highest average earnings, less (b) 2.0% of highest average pensionable earnings; multiplied by (c) years of pensionable service. The member's highest average pensionable earnings are the member’s average annual earnings in the five consecutive years of pensionable service in which such average is the highest. Pensionable earnings are limited each year to the amount as determined from the maximum defined benefit pension limit under the *Income Tax Act.* The member's highest average earnings are the member’s average annual earnings in the five consecutive years of pensionable service in which such average is the highest. Earnings are not limited.

Early Retirement

Eligibility	Permitted for a member who has attained the age of 55 and accrued five years of combined pensionable service under MEPP.
Benefit	A member's pension is reduced by 3% for each year that the early retirement age precedes the earlier of age 60 and the age at which 80 points under MEPP would be reached, based on combined pensionable service to the date of termination. No reduction is applied if the member has accrued 80 points under MEPP (that is, age plus combined pensionable service is greater than or equal to 80) or has attained age 60.

Postponed Retirement

Eligibility	Any time after normal retirement date and before December 31 of the year in which the member attains age 71.
Benefit	Normal retirement benefit accrued to postponed retirement date. The benefit is actuarially increased from the normal retirement date to the postponed retirement date.

Termination of Employment

Eligibility	Members are vested following completion of five years of pensionable service.
Benefit	Non vested members receive a refund of their contributions with interest. Vested members are eligible to receive a deferred pension, payable upon commencement of the MEPP pension.

Pre-retirement Death

Eligibility	Members are vested following completion of five years of pensionable service.
Benefit	Beneficiaries of non-vested members receive the member's contributions with interest. If the member was vested at date of death, the surviving pension partner will receive either 100% of commuted value or an immediate unreduced pension for life determined as though the member

had retired on the day before death and elected a J&S 100% optional form pension, plus excess contributions. If there is no surviving pension partner, the beneficiary will receive 100% of commuted value plus excess contributions.

Disability

Eligibility	Qualification for benefits under employer-sponsored long-term disability plan.
Benefit	Participation in the Plan continues, but no pension is payable concurrently with the LTD benefit. For the purpose of determining contributions and benefits, pensionable salary will be the pensionable salary immediately preceding disability, increased by subsequent general wage increases applicable for that member's employment class.
Contributions	Members must contribute on their regular earnings in excess of the maximum earnings level as determined from the maximum defined benefit pension limit for each year of service under the *Income Tax Act*, based upon the employee contribution rate to the MEPP. These contributions are remitted to the RCA Fund. Participating employers will make matching contributions to the Plan, which will be remitted to the RCA Fund. Half of the member and employer contributions to the RCA Fund are remitted to Canada Revenue Agency and held in the RTA. In addition, participating employers will make contributions to the Reserve Fund, with the contribution rate established by actuarial valuations at least once every three years.
Contribution Rate History	Valuation date: December 31, 2002 Members and employers: 7.75% of excess earnings up to March 31, 2003 Employers: 6.8% of excess earnings effective July 1, 2003 to Reserve Fund Valuation date: December 31, 2005 Members and employers: 9.5% of excess earnings effective April 1, 2003 Employers: 5.8% of excess earnings effective July 1, 2005 to Reserve Fund

Valuation date: December 31, 2008
Members and employers: 10.5% of excess earnings effective July 1, 2005
Employers: 11.4% of excess earnings effective April 1, 2007 to Reserve Fund

Valuation date: December 31, 2009
Members and employers: 11.16% of excess earnings effective January 1, 2011
Employers: 22.6% of excess earnings effective April 1, 2011 to Reserve Fund

Valuation date: December 31, 2012
Members and employers: 12.80% of excess earnings effective January 1, 2014
Employers: 2.4% of excess earnings effective April 1, 2014 to March 31, 2015 to Reserve Fund, 9.9% of excess earnings effective April 1, 2015 to Reserve Fund

Normal Form of Payment

Member without pension partner at retirement

The normal form of pension is a lifetime pension guaranteed for 120 months. If the member dies before 120 monthly payments are made, the balance of the 120 payments are payable to the member's beneficiary or estate.

Member with pension partner at retirement

The normal form of pension is a joint form with a 2/3 survivor pension payable to the pension partner.

Cost-of-Living Increases

Cost-of-living increases based on 60% of the Alberta CPI apply to both deferred pensions and pensions-in-payment.

Definitions

Excess earnings

The difference between the member's actual earnings not limited by the maximum defined benefit pension limit under the *Income Tax Act,* and pensionable earnings.

Pensionable earnings

The member's actual earnings limited each year to the amount as determined from the maximum defined benefit pension limit under the *Income Tax Act*.

Pensionable service

Pensionable Service parallels pensionable service in the MEPP, commencing upon the later of July 1, 1999 and the date of employment except that optional service cannot be bought back under the Plan and service transferred into MEPP under a reciprocal transfer agreement is not counted under the Plan. Up to one year of unpaid leave may be bought back under the Plan provided the same period of service is also bought back under MEPP.

A copy of a letter from the Committee certifying the accuracy and completeness of the plan provisions summarized in this report is included in Appendix F of this report.

Appendix F: Administrator Certification

With respect to the Supplementary Retirement Plan for Public Service Managers, forming part of the actuarial report as at December 31, 2015, I hereby certify that, to the best of my knowledge and belief:

- The asset data provided or made available to the actuary is complete and accurate; and
- The actuary has been notified of all relevant events subsequent to the valuation measurement date.

S. McFadyen	**Executive Director, Senior Financial Officer**
Name (print) of Authorized Signatory Alberta Treasury Board and Finance	Title
Original Signed	**March 22, 2017**
Signature	Date

- The membership data and subsequent query answers provided or made available to the actuary are complete and accurate for all persons who are entitled to benefits under the terms of the plan in respect of service up to the date of the valuation;
- The summary of the Plan provisions contained in Appendix E is an accurate summary of the Plan provisions; and
- The actuary has been notified of all relevant events subsequent to the valuation measurement date.

D. Woloshyn	**Chief Financial Officer**
Name (print) of Authorized Signatory Alberta Pension Services Corporation	Title
Original Signed	**March 17, 2017**
Signature	Date

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