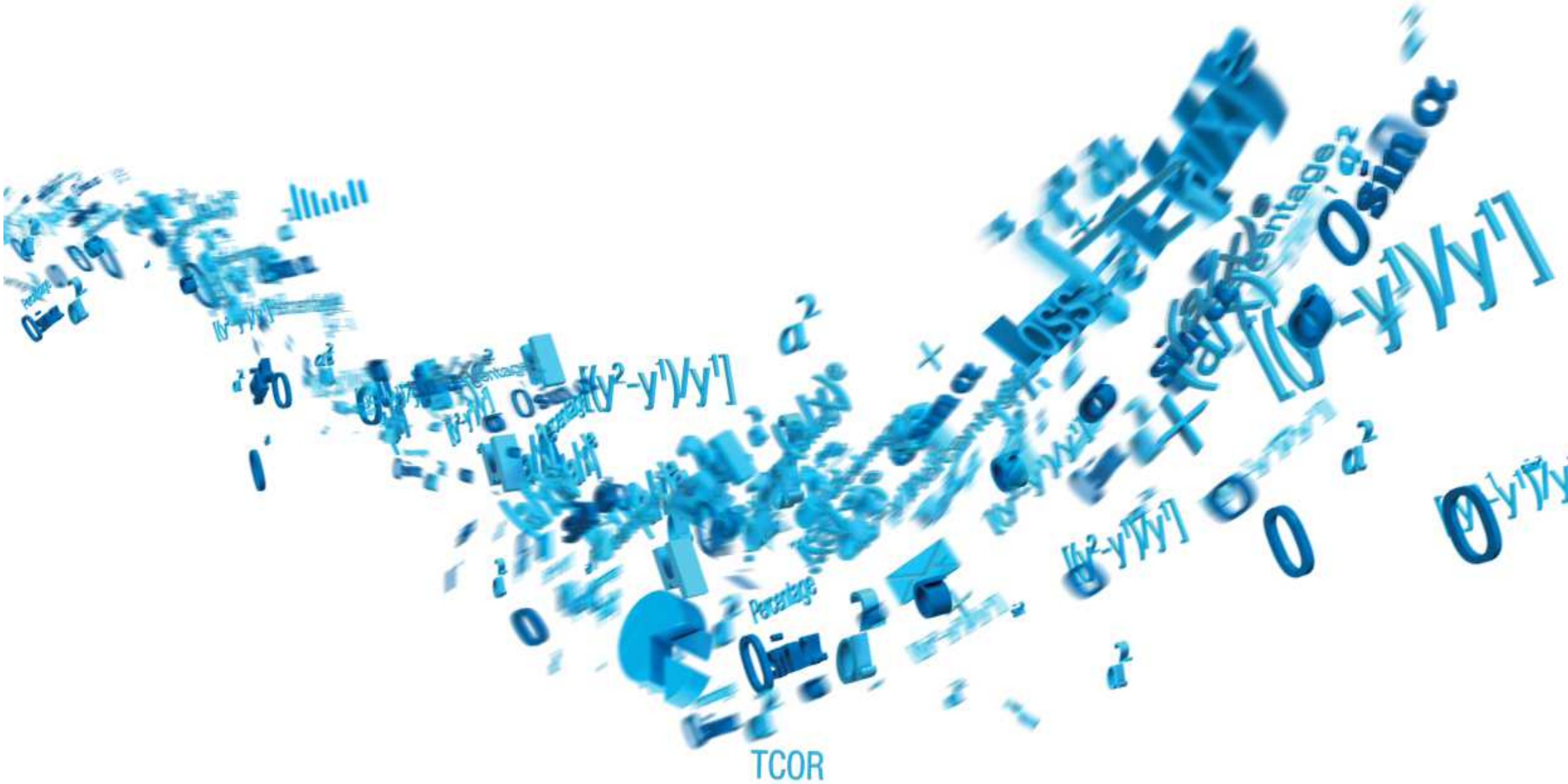

Funding Extrapolation Results as at December 31, 2015

Public Service Pension Plan

March 23, 2016

Empower Results®

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Section 1: Introduction

Purpose

We have been retained by the PSP Board to prepare an actuarial extrapolation for the *Public Service Pension Plan* (the "Plan") as at December 31, 2015 for the purpose of:

- determining the going-concern extrapolated financial position of the Plan at December 31, 2015 on the going-concern basis adopted as at December 31, 2014 and using actual actuarial asset values accrued to December 31, 2015;
- determining the extrapolated financial position of the Plan as at December 31, 2015 as if it were terminated and wound-up on this date, using a plan termination assumption basis and actual asset values both as at December 31, 2015;
- determining the extrapolated going-concern current service cost as at December 31, 2015 using the going-concern basis adopted as at December 31, 2014; and
- comparing the extrapolated going-concern funding requirements prepared as at December 31, 2015 to the most recent funding recommendation as at December 31, 2014.

As per our engagement, we have summarized the results of this extrapolation in this report to the PSP Board. It is important to note that the December 31, 2014 valuation and subsequent extrapolation to December 31, 2015 have been prepared to provide its users, the PSP Board updated information on the plan's financial position from the most recent funding recommendation that has been filed with the authorities. This extrapolation is not intended to update or revise the most recent funding recommendation and, consequently, has not been prepared for the purpose of filing with the regulatory authorities. Furthermore, this report does not constitute what is known as an *external user report* under the Canadian Institute of Actuaries standards of practice.

Summary of Changes since the Last Valuation

The last actuarial valuation report and corresponding funding recommendation that was filed under The Public Pension Plans Act (the "Act") and the Income Tax Act was prepared as at December 31, 2014. The latest date for the next actuarial valuation upon which an updated funding recommendation should be based is December 31, 2017.

Information and Inputs

In order to prepare the results contained in this report, we have relied upon the following information:

- Membership data as at December 31, 2014 obtained from Alberta Pension Services ("APS"), as summarized in Appendix B;
- Asset data as at December 31, 2015 obtained from Alberta Treasury Board and Finance, as summarized in Appendix C; and
- Information concerning events subsequent to the effective date of the valuation and prior to the date of this report as identified below.

Subsequent Events

The actuarial extrapolation performed as at December 31, 2015 considered subsequent events from December 31, 2014 up to the date of this report, such as actual cash-flows, investment returns, change in solvency assumptions and changes to Plan participating payroll during 2015. Apart from these items, we have not been made aware of any subsequent events which would have an effect on the results of the valuation and extrapolation. However, the following points should be noted in this regard:

- Actual experience deviating from expected since the date of the last full valuation will result in gains or losses which will be reflected in future valuations; and
- To the best of our knowledge, the results contained in this report are based on the regulatory and 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 these or other changes in the regulatory and legal environment transpire, any financial impact on the Plan as a result of such changes will be reflected in future valuations.

Section 2: Summary of Results

Estimated Going-Concern Financial Position as at December 31, 2015

The following table summarizes the Plan's going-concern financial position as at December 31, 2015 as determined from the extrapolation performed at this date. For comparison purposes, the going-concern results as at December 31, 2014 are also shown.

The going-concern results as at December 31, 2015 have been prepared based on the Plan provisions, membership data, asset data and assumptions and methods summarized in Appendices A, B, C and D respectively.

	December 31, 2015 Extrapolation ($millions)	December 31, 2014 Valuation ($millions)
Assets		
Market Value	$ 10,937	$ 9,787
Asset Fluctuation Adjustment	(850)	(785)
Total Assets	$ 10,087	$ 9,002
Actuarial Liabilities		
Best estimate liabilities	$ 10,614	$ 10,025
Implicit margin for adverse deviation[1]	754	710
Total Liabilities	$ 11,368	$ 10,735
Surplus/(Unfunded Liability)	**$ (1,281)**	**$ (1,733)**
Funded ratio	**89%**	**84%**

[1] Represents a reduction of 0.55% in the discount rate to account for margin for adverse deviation, as per the December 31, 2014 valuation.

Change in Going-Concern Financial Position

During the period from December 31, 2014 to December 31, 2015, the going concern financial position of the plan changed from an unfunded liability of $1,733 million to an unfunded liability of $1,281 million. The major components of this change are summarized in the following table (amounts rounded to the nearest million dollars):

	($ millions)
Surplus/(Unfunded liability) at December 31, 2014	**$ (1,733)**
Expected interest	(105)
Unfunded liability payments during 2015	203
Expected surplus/(unfunded liability) at December 31, 2015	**$ (1,635)**
Gain due to investment returns greater than expected	$ 354
Surplus/(Unfunded liability) at December 31, 2015	**$ (1,281)**

Estimated Solvency Financial Position as at December 31, 2015

The following table summarizes the Plan's solvency financial position as at December 31, 2015 as determined from the extrapolation performed at this date. For comparison purposes, the solvency results as at December 31, 2014 are also shown.

The solvency results as at December 31, 2015 have been prepared based on the Plan provisions, membership data, asset data and assumptions and methods summarized in Appendices A, B, C and E respectively.

	December 31, 2015 Extrapolation ($millions)	**December 31, 2014 Valuation ($millions)**
Assets		
Market Value	$ 10,937	$ 9,787
Estimated Wind-up Expenses	(25)	(25)
Total Assets	$ 10,912	$ 9,762
Actuarial Liabilities		
Total Liabilities	$ 19,879	$ 18,000
Surplus/(Unfunded Liability)	**$ (8,967)**	**$ (8,238)**
Solvency ratio	**55%**	**54%**

Section 3: Contribution Rates

Contribution Rate in Respect of Current Service Cost

The annual going-concern cost of benefits in respect of service accruing after the valuation date is known as the current service cost. On the basis of the Plan's provisions, membership data, going-concern assumptions and methods and asset information described in the Appendices, the following table sets out:

- the current service cost expressed as a percentage of pensionable earnings at December 31, 2014 and December 31, 2015;
- the provision for expenses included in the current service contribution rate; and
- the resulting total current service cost at December 31, 2014 and December 31, 2015.

	December 31, 2015 Extrapolation	**December 31, 2014 Valuation**
Current service cost rate	17.11%	17.11%
Provision for PSPP expenses	0.50%	0.50%
Total current service contribution rate	17.61%	17.61%
Implicit margin in current service cost	12.5%	12.5%

Contribution Rate in Respect of Unfunded Liability

In accordance with the *Act*, an unfunded liability must be amortized by a schedule of special contributions over a period not exceeding 15 years from the valuation date that it first arose. Once established, an amortization schedule remains in place until it can be eliminated either by actual contributions or net experience gains that are revealed in subsequent valuations. In the event that subsequent valuations reveal net experience losses, a new schedule is established to amortize the additional unfunded liability resulting from such losses.

In circumstances where a series of amortization schedules have been established and a valuation reveals a net experience gain, the *Act* permits a reduction in the established contribution rates or the amortization period, normally commencing with the amortization schedule that has been in existence the longest.

Since the Plan had a going-concern unfunded liability as at December 31, 2014, additional contributions were required to fund this deficiency. The following table summarizes the amortization schedules that have been established for the Plan as per the December 31, 2014 valuation:

Valuation Date at which Schedule Established	Commencement of Schedule	Contribution Rate (% pay)	End Date for Schedule
31-Dec-2002	1-Sept-2003	1.39%	31-Dec-2017
31-Dec-2005	1-Jan-2007	0.16%	31-Dec-2020
31-Dec-2008	1-Jan-2010	3.76%	31-Dec-2023
31-Dec-2010	1-Jan-2012	0.26%	31-Dec-2025
31-Dec-2011	1-Jan-2013	2.40%	31-Dec-2026
	Total	7.97%	

The amortization schedule of unfunded liability payments listed above must continue to be made up until the next valuation is filed.

Contribution Rate in Respect of Solvency Deficiency

Although the Plan revealed a solvency deficiency at December 31, 2014, the *Act* does not require additional contributions to fund the solvency deficiency.

Total Required Contribution Rate

The following contribution rates, as established in the December 31, 2014 valuation report, must continue to be made up until the next valuation is filed with the regulatory authorities. Note that these rates have been established on the basis that total costs are shared equally between active members and their employers.

Total Contribution Rates
(% of Pensionable Earnings)

	Members	Employers	Total
Level Rate On All Earnings			
Current Service Rate	8.805%	8.805%	17.61%
Unfunded Liability Payments	3.985%	3.985%	7.97%
Total Contribution Rate	12.790%	12.790%	25.58%
Split Rate Below/Above YMPE			
On Earnings Below YMPE	11.70%	11.70%	23.40%
On Earnings Above YMPE	16.72%	16.72%	33.44%

Section 4: Observations and Commentary

The primary purpose of this report is to provide the PSP Board with an updated financial position of the Plan as at December 31, 2015 based on an extrapolation of the December 31, 2014 valuation results. In particular, our analysis has not been prepared for the purpose of forming a formal actuarial opinion on the Plan's financial position or its funding requirements at December 31, 2015. As such, the results contained in this report should not be construed as complying with accepted actuarial practice.

Based on the results as at December 31, 2015, the following points summarize our principal observations and comments:

Going-Concern Results

- The actuarial methodology is appropriate under the circumstances and given our understanding of the Plan's Funding Policy Statement. We note that alternatives do exist with respect to allocating the total cost of benefits between past and future service; however, any alternative allocation will result in substantially similar current service contribution requirements for this Plan.

- The estimated results as at December 31, 2015 are based on membership data as at December 31, 2014. However, general membership statistics and actual membership movements were obtained from APS as at December 31, 2015 to test for any anomalies over the projection period. Test of sufficiently and credibility were not performed on the data, however, the 2015 experience is consistent with what was expected based on the assumptions and the historical experience of the Plan.

- The December 31, 2014 actuarial valuation revealed an unfunded liability equal to $1,733 million, which was to be amortized in accordance with the following table:

Valuation Date at which Schedule Established	Commencement of Schedule	Contribution Rate (% pay)	End Date for Schedule	Present Value at 31-Dec-2014 ($millions)
31-Dec-2002	1-Sept-2003	1.39%	31-Dec-2017	111
31-Dec-2005	1-Jan-2007	0.16%	31-Dec-2020	25
31-Dec-2008	1-Jan-2010	3.76%	31-Dec-2023	838
31-Dec-2010	1-Jan-2012	0.26%	31-Dec-2025	69
31-Dec-2011	1-Jan-2013	2.40%	31-Dec-2026	690
	Total	7.97%		1,733

As at December 31, 2015, the present value of the remaining amortization payments (i.e. expected unfunded liability) is $1,635 million and is more than the estimated unfunded liability revealed as at December 31, 2015 (i.e. $1,281 million under the going-concern assumption basis and level of margin for adverse deviation established as at December 31, 2014). If a valuation was filed as at December 31, 2015, based on the extrapolated going-concern results revealed as at December 31, 2015 and assuming no change in going-concern assumptions or margin for adverse deviation, the total required contributions could be reduced in accordance with the following table:

Total Estimated Contribution Rates
(% of Pensionable Earnings)

	Members	Employers	Total
Level Rate On All Earnings			
Current Service Rate	8.805%	8.805%	17.61%
Unfunded Liability Payments			
December 31, 2002	0.000%	0.000%	0.00%
December 31, 2005	0.000%	0.000%	0.00%
December 31, 2008	1.330%	1.330%	2.66%
December 31, 2010	0.130%	0.130%	0.26%
December 31, 2011	1.200%	1.200%	2.40%
Total Contribution Rate	11.465%	11.465%	22.93%
Split Rate Below/Above YMPE			
On Earnings Below YMPE	10.51%	10.51%	21.02%
On Earnings Above YMPE	15.01%	15.01%	30.02%

If the PSP Board wishes to file a valuation as at December 31, 2015 and not reduce the current contribution rates, the PSP Board could either increase the margin for adverse deviation in the Plan or reduce the amortization period in the amortization schedules shown above to absorb the gain in investment experienced by the Plan in 2015. It is estimated that increasing the margin for adverse deviation from 7.1% to approximately 10% would be sufficient to keep the contribution rates unchanged.

- The going-concern assumptions used to prepare the estimated going-concern financial position as at December 31, 2015 are consistent with those adopted for the December 31, 2014 valuation. If a valuation was filed as at December 31, 2015, a formal review of the assumption basis would need to be conducted. In particular, the following assumptions would need to be reviewed in more detail:

  - Inflation rate – There is continued pressure from regulators, auditors and the pension industry to reduce long-term inflation rates. Alberta Treasury Board and Finance recently reduced the long-term inflation assumption from 2.25% to 2.0% as at December 31, 2015. Since inflation forms the basis for the majority of the economic assumptions, a change in long-term inflation rate will have an impact on the going-concern financial position of the Plan. It is estimated that a decrease in inflation rate from 2.25% to 2.0% as at December 31, 2015 would increase total required contributions 0.50% to 0.75% (i.e. total required contributions would increase from 25.58% to between 26.08% and 26.33%).

- Best Estimate discount rate - The PSP Board recently conducted an asset liability study which resulted in changes to the long-term target asset mix for the Plan. It is estimated that the change in target asset mix will result in a net increase in the best estimate discount rate of approximately 5bps to 10bps and a net decrease in the going-concern liabilities at the next valuation.

- General earnings increase – The current long-term best estimate general earnings increase is equal to 3.5% per annum. This assumption is comprised of an annual increase of 2.25% on account of inflation, plus 1.0% on account national productivity, plus 0.25% on account of provincial productivity. Although a component of the general earnings increase is directly linked to the long-term inflation rate, the provincial productivity adjustment is not. Alberta Treasury Board and Finance recently removed the 0.25% provincial productivity adjustment in the long-term general earnings increase as at December 31, 2015. It is estimated that the removal of the provincial productivity adjustment would decrease total required contributions 0.25% to 0.50%.

- Interest on member contributions – In accordance with the terms of the Plan, interest credited to accumulated member contributions is equal to the rate of return credited to 5-year term deposits by Canadian chartered banks. The long-term forecasts for the 5-year term deposit rate continue to decline with the current economic environment. The current best estimate assumption for interest on member contributions is equal to inflation plus 2.0%. It is estimated that changing the interest on member contribution assumption from inflation plus 2% to inflation plus 1%, would result in a reduction in the total required contributions equal to 0.5% to 0.75%.

- Based on the asset valuation methodology adopted for the December 31, 2014 valuation, the Plan is estimated to have an Asset Fluctuation Reserve equal to $850 million as at December 31, 2015. The fund must earn in excess of -10% in 2016 in order for the Plan to meet its expected return target (i.e. discount rate of 6.6%).

- In accordance with the Plan's Funding Policy Statement, margin for adverse deviation is incorporated into the going-concern balance sheet through a reduction in the discount rate to promote benefit security and enhance contribution stability. The target margin for adverse deviation for the Plan is set at 10% of best estimate liabilities. The margin for adverse deviation in the December 31, 2014 valuation was set equal to 7.1% and was implicitly reflected as a reduction in the discount rate of 0.55%. To enhance transparency within the going-concern balance sheet, the PSP Board could consider moving from an implicit margin to an explicit margin in the going-concern balance sheet.

[Original signed by]

Troy Milnthorp, FSA, FCIA
Associate Partner

[Original signed by]

Sajad Abdulla, FSA, FCIA
Senior Consultant

Appendix A: Summary of Plan Provisions

This appendix outlines those provisions of the Plan which have a material impact on the amount and timing of benefits payable pursuant to the Plan and which were considered in the actuarial valuation at the valuation date.

The Plan was implemented by Bill 68 of the Alberta legislature and is known as the Public Sector Pension Plans Act (No. 2) (hereinafter referred to as the "Act") which received Royal Assent on May 14, 1993. Most of its provisions, including those dealing with pension and related benefits, came into effect January 1, 1994. The Act is a continuation of the Public Service Pension Plan Act, which was applicable prior to 1994.

Schedule 2 to the Act established the Public Service Pension Board and outlines the duties of the Board and the funding disciplines. A Regulation to the Act (the Public Service Pension Plan, Alberta Regulation 368/93) outlines the specific benefit provisions of the Plan.

This summary does not constitute a legal interpretation of the Plan. The Act and regulation should be reviewed for an interpretation in any specific circumstance.

Eligibility

Full-time and part-time employees of the government of Alberta, and of the agencies, boards and Provincial corporations identified in schedule 2 to regulation 368/93, are eligible to participate in the Plan.

Current Service Contributions

With effect from January 1, 1992, the current service benefit accruals of the Plan are to be funded in equal parts by contributions from employers and plan members which, in total, are equal to the normal cost of the benefit accruals attributable to the years the contributions are made.

The unfunded liability of the Plan at January 1, 1992 relating to pensionable service earned prior to 1992 was financed by additional contributions payable by the Crown, employers and Plan members from 1992 through 1998. Any unfunded liability of the Plan arising after 1998 is to be funded over a period not exceeding 15 years, in equal parts by contributions from employers and Plan members.

Credited Interest

Prior to 1994, Plan member contribution accounts were credited with interest at the rate of 4% per annum. Effective January 1, 1994, the interest credited to accumulated member contributions is equal to the rate of return credited on 5-year term deposits by Canadian chartered banks as reported in CANSIM series B14045 maintained by Statistics Canada.

Member Contribution Excess

Some of the Plan benefit provisions provide that, in respect of a period of pensionable service, where a member's own contributions with interest are greater than half the value of the benefit otherwise payable, the member receives a refund of the excess of his contributions with interest over half the value of the benefit. This is often referred to as the minimum 50% employer cost rule. For brevity, this report refers to such excess as "member contribution excess".

Normal Retirement Age

The normal retirement age is 65.

Normal Retirement Benefit

The benefit payable at normal retirement age is an annual pension equal to:

- 2.0% of average pensionable salary multiplied by years of pensionable service earned or credited in respects of periods prior to January 1, 1966, plus
- 1.4% of average pensionable salary up to the average YMPE multiplied by years of pensionable service earned or credited in respect of periods after January 1, 1966, plus
- 2.0% of average pensionable salary in excess of average YMPE, multiplied by years of pensionable service earned or credited in respect of periods after January 1, 1966.

Pensionable service accrues for a maximum of 35 years.

Average pensionable salary is the member's average annual pensionable salary in the 60 consecutive months in which such average salary was the highest.

The pensionable salary of part-time employees is grossed up to an annual basis to determine average pensionable salary.

Average YMPE is the average of the Year's Maximum Pensionable Earnings (as defined in the Canada Pension Plan) over the same 60-month period over which pensionable earnings are averaged.

Effective January 1, 1992, and only in respect of pensionable service after 1991, pensionable earnings for each calendar year are limited to the sum of:

- 50 times the defined benefit annual maximum pension limit for the year under the *Income Tax Act*, plus
- 30% of the YMPE for the year.

Normal Form of Pension

The normal form of pension payable at retirement is a pension payable monthly for the life of the pensioner, but guaranteed to continue for 60 months in any event. Optional forms of pension are available, on an actuarially equivalent basis.

Benefits on Early Retirement

A member who ceases to be a member after attaining age 55, and whose age and pensionable service total 85 or more, is entitled to a retirement pension commencing immediately without reduction for early retirement.

A member who ceases to be a member after attaining age 55 and who has completed two years of pensionable service, but whose age and pensionable service do not total 85, may elect to receive a pension commencing immediately that is reduced by an early retirement reduction. The early retirement reduction is 3% for each year by which the early retirement date precedes the date that the member could have retired without an early retirement reduction penalty being applied (without recognition of potential service).

Benefits on Disability

A member, or a former member who remains entitled to a deferred pension, who is totally disabled and has completed two years of pensionable service, and is not receiving benefits under an approved disability plan, is entitled to receive an immediate pension without application of the early retirement reduction factor.

A person who satisfies the above conditions, but is only partially disabled, is entitled to receive a pension commencing immediately that is reduced to reflect an early retirement discount. The early retirement reduction factor will be 3% per year, determined as for early retirement.

A person who is receiving benefits from an approved disability plan is not entitled to receive, concurrently, a disability pension from the Plan. While in receipt of benefits from an approved disability plan, participation in the Plan continues. Salary, for the purpose of current service contributions or for the purpose of determining any pension to which the member may subsequently become entitled, is the salary that was being earned immediately before disability benefits commenced, increased by any subsequent general increases applicable to the pre-disability class of employment of the member.

Benefits on Death Before Retirement

A pre-retirement death benefit is payable to the pension partner or beneficiary of a member who dies, in the amount of:

a) if death occurs prior to completion of two years of pensionable service, the member’s contributions with interest, or

b) if death occurs after two years of pensionable service, the commuted value of the benefit to which the member would have been entitled on termination of membership immediately prior to death.

A surviving pension partner has the option to elect a monthly pension in lieu of b) above. Such a monthly pension is determined as the survivor’s pension as if the member had retired on an unreduced pension and elected a Joint-and-Survivor 100% optional form.

Benefits on Termination of Employment

On termination of employment before the completion of two years of pensionable service, a member has the option of:

a) receiving a refund of member contributions with interest; or

b) transferring member contributions with interest plus any other amount transferable under a reciprocal agreement to another registered pension plan.

On termination of employment after the completion of two years of pensionable service but before being entitled to receive an immediate pension, a member has the option of:

a) receiving a pension commencing at or after age 55 calculated to reflect the early retirement discount applicable at the actual date of retirement of the member (i.e., 3% per annum) and reflecting only pensionable service performed to the date of termination, or

b) transferring the commuted value of his accrued vested pension and any member contribution excess.

Purchase of Service

Members are entitled to purchase certain periods of service. The actuarial basis for determining the purchase price approximates the going-concern actuarial liability that will arise in respect of that service.

Cost-of-Living-Increases

Pensions payable to retired members, former members with deferred pensions and survivors will be increased annually to reflect 60% of the increase in the Consumer Price Index for Alberta. The PSP Board may approve additional ad hoc cost of living increases.

Combined Pensionable Service

Combined Pensionable Service (“CPS”) affects members who transfer to (or from) employment covered by the Plan from (or to) employment covered by either the *Management Employees Pension Plan* (“MEPP”) or the *Universities Academic Pension Plan* (“UAPP”).

When a member of MEPP or UAPP transfers to the Plan, only the member’s pensionable service as a member of the Plan is recognized as pensionable service for calculating his accrued pension. However, determination of eligibility to benefits from the Plan, such as vesting, early retirement, and the amount of early retirement reduction, is based on the member’s CPS. In this case, the member’s CPS is equal to his pensionable service under the Plan plus his pensionable service under his former plan.

Likewise, when a Plan member transfers to UAPP or to MEPP, only the member’s pensionable service in the Plan up to the time of transfer is used in calculating his accrued pension, but his CPS is used in determining benefit eligibility as described above. In this case, the member’s CPS is equal to his pensionable service under the Plan plus his pensionable service under his new plan.

In either case, the member’s accrued pension is based on his highest 5-year average earnings over his CPS under the Plan and the other plan.

Transfer Agreement – ATB

A transfer agreement has been established with Alberta Treasury Branches (“ATB”), a participating employer in the Plan, under which assets and liabilities will be transferred from the Plan to the ATB pension plan in respect of Plan members who become ineligible to participate in the Plan due to becoming eligible to participate in the ATB pension plan. The amount of such transfer is determined as the Plan's estimated actuarial funding valuation liability for such member.

Portability Agreements – LAPP & Other Public Sector Plans

Portability agreements have been established with the *Local Authorities Pension Plan* (“LAPP”) and with other public sector pension plans, under which a member, who moves from (to) employment covered by the Plan to (from) employment covered by such other plan, has the option to transfer service credits from his former plan to his new plan, with a corresponding transfer of funds between the plans. The amounts of such service transfer and fund transfer are based on the estimated respective actuarial funding valuation liability for such member in each of the plans.

Appendix B: Summary of Membership

Source of Data and Data Checks for the 2014 Valuation

Data for the valuation as at December 31, 2014 for active participants, pensioners, deferred pensioners and hold-on-deposit members were supplied by Alberta Pensions Services Corporation ("APSC"). The data included financial and demographic information for each actively employed member, inactive member, pensioner, and beneficiary of a deceased member.

Various tests on the membership data were conducted to ensure its validity. Tests performed included the following:

- Membership reconciliation with prior valuation data, which is presented hereunder.
- Comparison of changes in salaries, years of membership and credited service.
- Comparison of pensions payable to retirees and lump sum benefits paid following termination of employment or death compared to amounts contained in the asset data.
- Validation with APSC of all deviations observed in information compared to data provided for the previous actuarial valuation and adjustments made where necessary.

The results of the tests performed demonstrated that the membership data was complete, except that 2014 pensionable earnings data were missing for 1375 active/CPS members. To estimate this missing data, these members were assigned 2014 pensionable earnings equal to the average 2014 pensionable earnings for the quinquennial age and service group to which they belong.

In our opinion, the impact of these data estimates does not materially affect the results of the valuation. The adjusted data is sufficient and reliable for the purposes of this valuation.

Summary of Membership Data

The tables that follow summarize the key membership statistics.

Active Members

	December 31, 2014	December 31, 2013
Number		
Male	13,440	12,891
Female	28,121	27,367
Total	**41,561**	**40,258**
Average Age		
Male	43.5	43.9
Female	44.2	44.4
Total	**44.0**	**44.2**
Average Plan Service		
Male	9.7	10.3
Female	9.7	10.1
Total	**9.7**	**10.2**
Average 2014 Annualized Earnings		
Male	$ 76,304	$ 72,295
Female	65,061	61,195
Total	**$ 68,697**	**$ 64,749**

CPS Suspended Members

	December 31, 2014	December 31, 2013
Number		
Male	1,745	1,691
Female	2,115	2,020
Total	**3,860**	**3,711**
Average Age		
Male	47.8	47.9
Female	47.1	47.3
Total	47.5	**47.6**
Average Plan Service		
Male	9.3	9.5
Female	9.4	9.7
Total	9.4	**9.6**
Average CPS		
Male	6.6	6.6
Female	5.5	5.5
Total	6.0	**6.0**
Average 2014 Annualized Earnings		
Male	$114,791	$109,567
Female	105,788	100,184
Total	**$109,858**	**$104,459**

Deferred Members

	December 31, 2014	December 31, 2013
Number		
Male	2,890	2,860
Female	5,982	5,911
Total	**8,872**	**8,771**
Average Age		
Male	48.8	48.5
Female	47.2	47.1
Total	**47.7**	**47.6**
Average Deferred Pension[2]		
Male	$ 7,290	$ 7,276
Female	5,737	5,613
Total	**$ 6,243**	**$ 6,155**

Hold-on-Deposit Members

	December 31, 2014	December 31, 2013
Number		
Male	1,192	1,192
Female	2,519	2,545
Total	**3,711**	**3,737**
Average Age		
Male	50.7	50.2
Female	48.8	47.9
Total	**49.4**	**48.6**
Average Contributions with Interest		
Male	$ 2,540	$ 2,487
Female	2,497	2,472
Total	**$ 2,511**	**$ 2,477**

Retired Members and Survivors/Beneficiaries

	December 31, 2014	December 31, 2013
Number		
Male	10,669	8,907
Female	13,130	13,857
Total	**23,799**	**22,764**
Average Age		
Male	73.9	72.2
Female	71.4	72.2
Total	**72.5**	**72.2**
Average Current Pension (including any coordination)		
Male	$ 16,755	$ 16,649
Female	12,905	12,068
Total	**$ 14,631**	**$ 13,860**

[2] Includes cost of living adjustments to the January 1 following the valuation date.

Active Membership Distribution

The following tables provide a break-down of the active at December 31, 2014 by years of credited service and by age group, showing the number of members, the average earnings and the average accumulated member contributions with interest in each age/service group.

All Active

COMPLETED YEARS OF PENSIONABLE SERVICE

Age	Under 5	5 - 9	10 - 14	15 - 19	20 - 24	25 - 29	30 - 34	35 and Over	Total
Under	1,360	5							1,365
25	51,802	53,951							51,810
	5,837	25,821							5,912
25-29	4,124	528							4,652
	59,674	65,340							60,317
	11,435	35,483							14,186
30-34	3,617	1,939	165	1					5,722
	64,167	72,065	74,094	52,779					67,127
	14,007	42,801	59,806	51,137					25,140
35-39	2,369	1,900	769	103	1				5,142
	65,731	75,153	78,978	75,951	129,263				71,411
	15,176	47,632	69,603	77,219	133,567				36,637
40-44	1,806	1,581	973	479	74	7			4,920
	64,111	74,181	78,273	78,554	70,512	63,397			71,649
	14,497	48,547	71,817	86,685	89,929	89,867			45,088
45-49	1,456	1,369	801	597	427	243	14		4,907
	65,477	71,662	77,278	76,015	75,001	71,833	71,044		71,570
	15,046	47,229	71,999	85,261	101,313	106,484	118,865		54,243
50-54	1,197	1,203	856	681	581	715	567	50	5,850
	66,260	69,557	72,219	75,767	73,306	76,215	71,501	69,463	71,368
	15,617	45,898	67,937	86,616	102,277	119,842	122,978	121,416	70,523
55-59	787	948	715	630	507	629	600	315	5,131
	64,306	69,347	70,797	71,449	72,918	73,417	73,922	71,254	70,538
	15,854	46,458	67,270	82,144	104,279	118,264	135,488	118,261	78,405
60-64	325	531	411	410	308	365	406	345	3,101
	63,731	68,853	69,361	70,070	68,032	69,147	72,110	73,035	69,389
	17,378	45,924	66,529	81,376	98,062	114,292	138,474	122,392	84,201
65	72	132	106	111	63	88	84	115	771
and Over	66,385	66,650	68,700	70,306	68,572	68,861	73,944	77,498	70,256
	15,588	44,583	66,095	81,540	96,393	113,673	136,198	123,591	84,039
Total	17,113	10,136	4,796	3,012	1,961	2,047	1,671	825	41,561
	62,577	71,770	74,906	74,378	72,517	73,215	72,637	72,761	68,697
	13,318	45,708	69,129	84,190	101,284	116,414	131,865	120,923	49,033

Each cell shows:

- Number of Members
- Average annual pensionable earnings
- Average contributions with interest

Male Active

COMPLETED YEARS OF PENSIONABLE SERVICE

Age	Under 5	5 - 9	10 - 14	15 - 19	20 - 24	25 - 29	30 - 34	35 and Over	Total
Under	478	1							479
25	55,707	51,548							55,698
	6,206	23,156							6,242
25-29	1,371	151							1,522
	62,558	72,335							63,528
	12,108	41,418							15,045
30-34	1,231	621	55						1,907
	68,454	76,138	79,618						71,278
	14,826	47,459	65,589						26,968
35-39	872	636	236	41	1				1,786
	72,256	80,137	85,088	83,669	129,263				77,052
	17,410	53,625	78,200	87,517	133,567				40,103
40-44	611	562	347	183	17	1			1,721
	71,763	82,000	84,745	86,565	77,625	81,333			79,361
	17,137	56,405	80,643	98,116	101,434	106,645			52,281
45-49	436	436	238	207	143	73	6		1,539
	75,912	80,713	88,132	85,754	80,207	77,956	70,084		80,959
	17,219	55,771	86,436	100,438	111,719	118,792	112,490		64,100
50-54	318	356	229	206	170	272	127	8	1,686
	80,885	81,263	85,975	88,227	82,657	82,555	81,075	72,184	82,974
	19,145	56,606	85,893	106,707	119,957	132,250	142,959	155,744	85,442
55-59	237	282	176	176	147	217	209	93	1,537
	77,009	79,664	85,662	82,615	83,131	81,378	83,407	81,566	81,477
	19,119	56,383	86,860	98,516	124,706	134,317	158,834	147,838	95,954
60-64	98	164	115	119	73	107	179	142	997
	75,508	80,949	80,026	83,215	83,267	80,673	79,594	83,406	80,825
	20,426	55,667	80,612	99,882	127,136	139,484	156,673	147,289	105,770
65	27	45	28	28	16	27	32	63	266
and Over	73,115	78,901	79,110	82,069	75,594	85,856	85,677	86,065	81,688
	15,552	55,782	80,012	98,087	114,097	150,748	169,315	143,028	106,171
Total	5,679	3,254	1,424	960	567	697	553	306	13,440
	68,667	79,508	84,989	85,353	81,972	81,544	81,624	83,101	76,304
	14,804	53,338	82,222	100,299	119,338	133,274	154,592	146,800	56,845

Each cell shows:

Number of Members
Average annual pensionable earnings
Average contributions with interest

Female Active

COMPLETED YEARS OF PENSIONABLE SERVICE

Age	Under 5	5 - 9	10 - 14	15 - 19	20 - 24	25 - 29	30 - 34	35 and Over	Total
Under	882	4							886
25	49,686	54,551							49,708
	5,637	26,487							5,733
25-29	2,753	377							3,130
	58,238	62,538							58,756
	11,101	33,106							13,770
30-34	2,386	1,318	110	1					3,815
	61,955	70,146	71,332	52,779					65,053
	13,584	40,606	56,915	51,137					24,226
35-39	1,497	1,264	533	62					3,356
	61,930	72,646	76,272	70,847					68,409
	13,878	44,617	65,796	70,409					34,795
40-44	1,195	1,019	626	296	57	6			3,199
	60,199	69,869	74,686	73,602	68,390	60,407			67,501
	13,143	44,213	66,925	79,618	86,497	87,071			41,213
45-49	1,020	933	563	390	284	170	8		3,368
	61,016	67,432	72,690	70,846	72,380	69,203	71,764		67,280
	14,120	43,238	65,896	77,205	96,074	101,198	123,646		49,744
50-54	879	847	627	475	411	443	440	42	4,164
	60,969	64,637	67,194	70,363	69,438	72,322	68,737	68,945	66,669
	14,357	41,397	61,379	77,902	94,964	112,224	117,210	114,877	64,497
55-59	550	666	539	454	360	412	391	222	3,594
	58,832	64,979	65,943	67,120	68,748	69,225	68,853	66,935	65,860
	14,442	42,255	60,874	75,798	95,938	109,810	123,009	105,870	70,896
60-64	227	367	296	291	235	258	227	203	2,104
	58,646	63,448	65,218	64,695	63,299	64,367	66,208	65,780	63,970
	16,062	41,570	61,057	73,809	89,031	103,844	124,123	104,976	73,980
65	45	87	78	83	47	61	52	52	505
and Over	62,347	60,313	64,963	66,337	66,182	61,338	66,724	67,119	64,234
	15,610	38,791	61,099	75,958	90,366	97,262	115,819	100,043	72,381
Total	11,434	6,882	3,372	2,052	1,394	1,350	1,118	519	28,121
	59,553	68,111	70,647	69,244	68,672	68,915	68,192	66,664	65,061
	12,580	42,100	63,600	76,653	93,940	107,709	120,623	105,666	45,303

Each cell shows:

Number of Members
Average annual pensionable earnings
Average contributions with interest

Pensioner/Beneficiary Membership Distribution

The following table provides a break-down of the retired membership at December 31, 2014 by age and years since retirement, showing the number of members and the average annual pension in each age/service group.

Pensioners

YEARS SINCE RETIREMENT

Age	Under 5	5 - 14	15 - 24	25 - 34	35 and Over	Total
Under 60	1,391 22,264	87 9,493	45 9,076	8 7,388		1,531 21,073
60-64	1,932 22,591	1,472 18,713	49 8,581	17 6,176	4 4,665	3,474 20,649
65-69	1,981 19,409	3,178 15,839	58 10,324	32 6,371	9 4,654	5,258 17,047
70-74	366 18,254	2,442 15,086	1,471 10,274	40 9,671	12 4,710	4,331 13,641
75-79	26 13,590	1,089 13,003	2,279 10,406	60 9,804	21 6,789	3,475 11,211
80-84		76 9,377	1,888 10,251	742 9,356	23 5,783	2,729 9,946
85-89			809 10,238	960 9,937	34 7,179	1,803 10,020
90 and Over			50 9,442	903 9,599	245 8,924	1,198 9,454
Total	5,696 21,085	8,344 15,631	6,649 10,282	2,762 9,592	348 8,112	23,799 14,631

Each cell shows:

Number of Members

Average annual pension

Appendix C: Summary of Assets

The assets consist primarily of direct ownership in units of pooled investment funds (“the pools”). The pools are established under Part 5 of the *Financial Administration Act* of Alberta. Participants in pools include government and non-government funds and plans. Alberta Investment Management Corporation (“AIMCo”) controls the creation of the pools and the management and administration of the pools including security selection. We have used data provided by the administrator as to the market value of the Plan assets, adjusted to be on an accrued basis.

Reconciliation of Net Invested Assets Available for Benefits

A reconciliation, as reported in the draft financial statements as at December 31, 2015 and dated February 12, 2016, of the change in market value of the Plan fund for fiscal years 2014 and 2015 is provided below.

	Fiscal Year Ending December 31	
	2015 ($ 000s)	**2014 ($ 000s)**
Opening Market Value	$ 9,787,123	$ 8,558,578
Contributions:		
Employees	346,463	324,966
Employer	346,356	324,718
Prior Service	4,894	4,643
Transfers from Other Plans	11,591	11,232
Benefits:		
Retirement Benefits	(353,809)	(319,609)
Disability Benefits	(1,713)	(1,911)
Termination Benefits	(104,102)	(107,067)
Death Benefits	(32,893)	(21,226)
Transfers to Other Plans	(18,485)	(21,816)
Investment Earnings	1,018,367	1,094,850
Expenses:		
Investment Expenses	(53,554)	(48,235)
Administrative Expenses	(13,040)	(12,000)
Closing Market Value	$ 10,937,198	$ 9,787,123
Approximate Rate of Return (net of investment expenses)	9.8%	12.1%

Asset Allocation

The following is a summary of the composition of the Plan's trust fund assets by asset type as reported in the draft financial statements as at December 31, 2015 dated February 12, 2016. For comparison purposes, the composition at the previous valuation date is also shown.

	December 31, 2015	December 31, 2014
Cash and Short Term	0.5%	0.5%
Liability matching assets	15.0%	15.2%
Other fixed income	13.7%	16.6%
Equities	48.5%	49.6%
Alternatives	21.6%	17.4%
Strategic opportunities	0.7%	0.7%
Total Invested Assets	100.0%	100.0%

Rates of Return

The Plan's assets achieved the following rate of returns, before administration expenses but after investment expenses:

	2015	2014	2013	2012
Market Value	9.8%	12.1%	14.4%	11.5%
Actuarial Asset Value	9.9%	10.3%	10.7%	3.2%

Development of Asset Fluctuation Adjustment

The development of the asset fluctuation adjustment is shown in the following tables. Please refer to Appendix C for a description of the asset valuation methodology.

	2011	2012	2013	2014	2015
Accum / Market Value Dec. 31, 2011	$6,481				
Net Cash Flow 2012	71				
Assumed Income @ 7.08%	460				
Accum / Market Value Dec. 31, 2012	$7,012	$7,300			
Net Cash Flow 2013	194	194			
Assumed Income @ 7.06%	502	522			
Accum / Market Value Dec. 31, 2013	$7,708	$8,016	$8,559		
Net Cash Flow 2014	182	182	182		
Assumed Income @ 7.0%	546	567	605		
Accum / Market Value Dec. 31, 2014	$8,436	$8,765	$9,346	$9,787	
Net Cash Flow 2015	185	185	185	185	
Assumed Income @ 6.6%	562	585	623	652	
Accum / Market Value Dec. 31, 2015	$9,185	$9,535	$10,154	$10,624	$10,937
Summary					
Average of Final Values				$10,087	
90% of 2015 Market Value				$9,843	
Greater of these two values				$10,087	
Less 2015 Market Value				(10,937)	
Asset Fluctuation Adjustment				$ (850)	

Appendix D: Going-Concern Actuarial Assumptions and Cost Methods

The following table provides a summary of the going-concern assumption basis adopted for the December 31, 2014 valuation and subsequent extrapolation to December 31, 2015. Further detail regarding each assumption can be found in the actuarial valuation report as at December 31, 2014 and dated June 18, 2015.

Going-Concern Assumptions

	December 31, 2014 Valuation	December 31, 2015 Extrapolation
Demographic		
Mortality	Males: CPM Private Table projected with Scale CPM-B Females: 95% of CPM Private Table projected with Scale CPM-B	Males: CPM Private Table projected with Scale CPM-B Females: 95% of CPM Private Table projected with Scale CPM-B
Retirement	Actives: age and service-based, gender distinct table based on 2015 experience study Deferred: age 55	Actives: age and service-based, gender distinct table based on 2015 experience study Deferred: age 55
Termination	5-year select, gender distinct, age-based table based on 2015 experience study	5-year select, gender distinct, age-based table based on 2015 experience study
Proportion of vested terminated members electing a lump sum	80% if service less than 5 years, 50% if service between 5 and 15 60% if service between 15 and 20 70% if service between 20 and 25 75% if service greater than 25	80% if service less than 5 years, 50% if service between 5 and 15 60% if service between 15 and 20 70% if service between 20 and 25 75% if service greater than 25
Proportion of members with spouses and spousal age differential	100% married; Male spouse 3 years older	100% married; Male spouse 3 years older
Future PSPP membership for funding the unfunded liability	PSPP active membership will remain stable and the aggregate pensionable earnings base will increase at the rate of increase for general earnings	PSPP active membership will remain stable and the aggregate pensionable earnings base will increase at the rate of increase for general earnings

	December 31, 2014 Valuation	December 31, 2015 Extrapolation
Economic		
Inflation rate	2.25%	2.25%
Long-term rate of return	6.60%	6.60%
Discount rate	6.05%	6.05%
Discount rate for terminated members electing a lump sum	3.50%	3.50%
Inflation rate for terminated members electing a lump sum	2.00%	2.00%
Increases in pensionable earnings:		
i) General earnings increase rates	2.25% for 2014 3.50% thereafter	2.25% for 2014 3.50% thereafter
ii) Merit and promotion increase rates	Age based rates based on the 2015 experience study	Age based rates based on the 2015 experience study
YMPE and Max Pension Limit	3.50%	3.50%
Cost-of-living adjustments	1.35%	1.35%
Interest on member contributions	4.25%	4.25%
Increase on advance pensioners	10%	10%
Expenses	0.5% of pensionable earnings	0.5% of pensionable earnings

Actuarial Cost Method

The actuarial valuation was performed using the accrued benefit method with projected earnings. The actuarial liability is that portion of the actuarial present value of projected future benefits that is directly related to service performed prior to the valuation date and the benefit formulae applicable to that service.

The normal actuarial cost is that portion of the actuarial present value of projected future benefits that is directly related to service expected to be performed in the year following the valuation date and the benefit formulae applicable to that service.

Projected future benefits reflect pensionable earnings, YMPE, and *Income Tax Act* benefit limits projected to the time of benefit determination. Future service, as it relates to benefit eligibility (e.g. vesting, early retirement reductions), was also projected in projecting future benefits.

Asset Valuation Method

The going-concern asset valuation method determines the value that will be assigned to the assets on the valuation date. The actuarial value of assets has been determined by applying a smoothing methodology to the Plan's market value of assets at December 31, 2015. The same method was used in the previous valuation.

The actuarial value of assets is based on the market value of PSPP assets (adjusted for accrued contributions and payments), plus an Asset Fluctuation Adjustment. This adjustment is based on a five-year smoothing of market rates of return over the expected long-term rate of return, specifically:

- investment income is assumed to accrue each year at a rate equal to the expected long-term rate of return assumed in the most recent valuation as at the beginning of that year[3];
- actual market values of the PSPP's assets from each of the four previous year-ends are then projected to the current valuation date, using actual (adjusted) annual net cash flows and imputed investment income at these assumed rates for each year;
- these four projected results at the current valuation date, together with the actual market value at the current valuation date, are then averaged;
- this averaged value is then constrained to be no less than 90%, and no greater than 110%, of the current market value;
- the Asset Fluctuation Adjustment is calculated as the excess (positive or negative) of this constrained averaged value over the market value.

The actuarial asset value is then determined as the market asset value at the valuation date, plus the Asset Fluctuation Adjustment. Calculation of the Asset Fluctuation Adjustment for the current valuation is detailed in Appendix A of this report.

Expenses

No explicit allowance has been made for expenses paid from the Plan other than an allowance of 0.5% of pensionable earnings which has been included in the current service cost.

[3] The expected long-term rate of return net of margin (i.e. the discount rate) was used to calculate the imputed investment income for years prior to 2012.

Extrapolation Methods

For reporting at December 31, 2015, the actuarial liability for accrued benefits was determined as at December 31, 2014 and then extrapolated to December 31, 2015 by:

- increasing the accrued liabilities with the benefits earned (determined by applying the current service rate to estimated total pensionable earnings after the valuation date and up to the date of the extrapolation),
- increasing the accrued liabilities with benefits purchased and with benefits transferred-in,
- reducing the accrued liabilities with the benefit payments made after the valuation date and up to the date of the extrapolation, and
- adjusting the accumulations with appropriate interest, based on the applicable assumed nominal rate of return.

Appendix E: Solvency Assumptions and Methods

The following table provides a summary of the solvency assumption basis adopted as at December 31, 2014 and December 31, 2015:

Solvency Assumptions

	December 31, 2014	December 31, 2015
Proportion of benefits settled by lump sum transfer and annuity purchase	The following members are assumed to have their benefit entitlement settled by way of annuity purchase: ▪ all members receiving a monthly pension at the valuation date; and ▪ members who, on the valuation date, are eligible for immediate retirement. All other members are assumed to have their benefit entitlement settled by way of a lump sum transfer.	Same
Discount rate – annuity purchase	The net discount rate assumed to apply to benefits that are settled by way of annuity purchase is 0.75% per annum. This discount rate assumption is representative of the rate that, together with the UP-94 Generational Mortality Table, approximates partially indexed annuity purchase rates at the valuation date, in accordance with guidance provided by the Canadian Institute of Actuaries for solvency valuations as at December 31, 2014.	The net discount rate assumed to apply to benefits that are settled by way of annuity purchase is 1.2% per annum. This discount rate assumption is representative of the rate that, together with the CPM 2014 Combined Mortality Table, approximates partially indexed annuity purchase rates at the valuation date, in accordance with guidance provided by the Canadian Institute of Actuaries for solvency valuations as at December 31, 2015.
Discount rate – lump sum transfer	The net discount rate assumed to apply to benefits that are settled by way of lump sum transfer is 1.8% for 10 years and 2.5% thereafter.	The net discount rate assumed to apply to benefits that are settled by way of lump sum transfer is 1.6% for 10 years and 2.6% thereafter.
Salary, YMPE and Maximum Pension Limits	No future increase is assumed.	Same
Expenses	It is assumed that the windup expenses, if the PSPP were to be terminated, would be $25,000,000. These expenses have been treated as a reduction to assets, in accordance with the *EPPA* and accepted actuarial practice.	Same

Mortality – annuity purchases	For benefits that are settled by way of annuity purchase, mortality is assumed to be in accordance with the gender distinct rates of the UP-94 Generational Mortality Table. This mortality assumption is representative of the mortality table that, together with the net discount rate assumption of 0.75%, approximates annuity purchase rates at the valuation date, in accordance with guidance provided by the Canadian Institute of Actuaries for solvency valuations as at the valuation date.	For benefits that are settled by way of annuity purchase, mortality is assumed to be in accordance with the gender distinct rates of the CPM 2014 Combined Mortality Table. This mortality assumption is representative of the mortality table that, together with the net discount rate assumption of 1.2%, approximates annuity purchase rates at the valuation date, in accordance with guidance provided by the Canadian Institute of Actuaries for solvency valuations as at the valuation date.
Mortality – lump sum transfer	For benefits that are settled by way of lump sum transfer, mortality is assumed to be in accordance with gender distinct rates of the UP-94 Generational Mortality Table.	For benefits that are settled by way of lump sum transfer, mortality is assumed to be in accordance with gender distinct rates of the CPM 2014 Combined Mortality Table.
Termination Rates	All members are assumed to terminate their active participation on the valuation date and subsequently retire from the PSPP in accordance with the retirement age assumption summarized below.	All members are assumed to terminate their active participation on the valuation date and subsequently retire from the PSPP in accordance with the retirement age assumption summarized below.
Retirement Age	The age at which members are assumed to retire from the PSPP varies depending on the specifics of each member as follows: ▪ members who are entitled to retire from the PSPP and commence an immediate pension on the valuation date are assumed to do so; and ▪ all other members are assumed to retire from the PSPP at age 55.	The age at which members are assumed to retire from the PSPP varies depending on the specifics of each member as follows: ▪ members who are entitled to retire from the PSPP and commence an immediate pension on the valuation date are assumed to do so; and ▪ all other members are assumed to retire from the PSPP at age 55.

Solvency Actuarial Cost Method

The solvency liabilities have been calculated as the actuarial present value of the benefits to which a member would be entitled if participation in the Plan was terminated on the valuation date. It is further noted that the solvency liabilities do not take into consideration any benefit reductions that may be required in the event of actual Plan termination on the valuation date.

Solvency Asset Valuation Method

For purposes of the solvency valuation, assets have been valued at market value.