



Actuarial Report on

**British Columbia College  
Pension Plan**

Actuarial Valuation  
as at August 31, 2012

Vancouver, British Columbia

May 21, 2013

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## Actuarial Report Highlights

### BC College Pension Plan

August 31, 2012

An actuarial valuation of the College Pension Plan was completed as at August 31, 2012. Its purpose was to determine the financial (or actuarial) position of the Plan as at August 31, 2012 and to report on the adequacy of the member and employer contribution rates.

#### Scope of Valuation

Two primary valuations were carried out:

- **A Funding Valuation** - to determine the financial position of the Basic Account as at August 31, 2012 and to report on the adequacy of the member and employer contribution rates, and
- **A Sustainable Indexing Valuation** - to determine the rate of indexing that can be sustained in the long term, based on the financial position of the Basic Account and the Inflation Adjustment Account ("IAA"), and the overall level of contributions to the plan.

In addition, we show the results of a supplementary funding valuation taking into account basic and indexed benefits as if indexed benefits are to be fully funded in advance, as well as a funding valuation considering the impact of maximum benefits permitted under the *Income Tax Act* ("ITA").

#### Key Plan Changes Included in the Valuation

- Effective September 1, 2010, member contribution rates to the Basic Account were increased to 7.56% of pensionable salary up to the Yearly Maximum Pensionable Earnings ("YMPE") and 8.31% on pensionable salary above the YMPE.
- Effective September 1, 2010, employer contribution rates to the Basic Account were increased to 7.66% of pensionable salary up to the YMPE and 8.41% on pensionable salary above the YMPE.
- Effective September 1, 2010, member and employer IAA contribution rates were increased to 1.38% of pensionable salary each.

There were no other benefit changes of material financial impact.

## Actuarial Methods and Assumptions

The actuarial liabilities include the value of benefits accrued by members as at August 31, 2012 as well as future benefits expected to be earned by existing members. Asset values are based on smoothed market values, plus projected future contributions based on entry-age normal contribution rates and the existing amortization rates.

The contribution rates are tested on the entry-age contribution method. Under this method, a long-term entry-age rate, which would fully fund benefits for future new entrants to the Plan, is calculated. The surplus (unfunded liability) is then amortized according to the requirements of the funding policy of the Board. This approach is designed to maintain costs at a level percentage of payroll over an extended period. The resulting contribution rate is then tested against the going-concern requirements of the BC Pension Benefits Standards Act ("PBSA") as required by the Joint Trust Agreement.

Assumptions were set taking into account the funding policy of the Board. The Funding Valuation focuses on setting an appropriate level of contributions to ensure the security of benefits; accordingly, the economic assumptions require margins for adverse deviations. The Sustainable Indexing Valuation focuses on setting a level of indexing, given the contributions committed to the plan, which is equitable across generations. As a result this valuation has been carried out using best estimate assumptions for future investment returns and price inflation. The key long-term assumptions used include:

	Funding Valuation	Sustainable Indexing Valuation
Annual Investment Return	6.5% <sup>1</sup>	6.75% <sup>1</sup>
Annual Salary Increase	3.75% <sup>1</sup> plus seniority	3.50% <sup>1</sup> plus seniority
Annual Indexing	0% <sup>1</sup> for basic costs 3.0% <sup>1</sup> for indexed costs	2.75% <sup>1</sup> for fully indexed costs Sustainable level of indexing calculated as valuation output

<sup>1</sup> Unchanged from the previous valuation.

## Funding Valuation Results

The funding valuation shows a deterioration in the actuarial position of the Basic Account on the entry-age normal contribution basis. A new unfunded liability of \$105 million has emerged since the August 31, 2009 valuation:

Basic Benefits Only: (\$000's)	2012	2009
Assets	3,513,528	3,109,665 <sup>1</sup>
Liabilities	3,618,924	3,109,665
Surplus (Unfunded Liability)	(105,396)	0 <sup>1</sup>

The corresponding supplementary valuation results are:

Basic and Indexed Benefits: (\$000's)	2012	2009
Assets	4,204,501	3,729,817 <sup>2</sup>
Liabilities	4,999,623	4,278,238
Surplus (Unfunded Liability)	(795,122)	(548,421) <sup>2</sup>

When the ITA maximums are recognized, the above funding valuation surpluses (unfunded liabilities) change marginally, to:

Benefits Limited to ITA Maximums: (\$000's)		2012	2009
Surplus (Unfunded Liability)	Basic Benefits only	(96,986)	3,393 <sup>2</sup>
	Basic and Indexed Benefits	(782,897)	(544,292) <sup>2</sup>

<sup>1</sup> The 2009 report showed a \$4.115 million unfunded liability. When amortized over 12 years (to 2021) this resulted in an amortization requirement of 0.06%. Showing the amortization requirement as an asset reduces the unfunded liability to zero.

<sup>2</sup> Including \$4.115 million amortization requirement established at the 2009 valuation.

## Main Reasons for Changes in Funding Valuation Actuarial Position

The main reasons for the deterioration in the actuarial funding position are:

- Smoothed investment returns lower than assumed; and
- Changes in the demographic assumptions;

offset by

- Actual salary increases lower than previously assumed.

## Member and Employer Contribution Rates – Basic Non-Indexed Benefits

Members currently contribute 8.31% of salaries, less 0.75% of salaries up to the YMPE, for basic non-indexed benefits; employers contribute 8.41% of salaries, less 0.75% of salaries up to the YMPE, for a total contribution rate of 16.72% integrated. The long term cost for future service (i.e. the entry-age, normal actuarial cost) is 16.84% integrated or 0.12% of salaries higher than the current combined member and employer contributions.

The funded position of the plan on the entry-age rate basis has deteriorated and a new unfunded liability of \$105 million has emerged since the August 31, 2009 valuation. Amortizing this in line with the PBSA results in a minimum required contribution of 18.04%. After the unfunded liability is fully funded, the contribution requirements will return to the long-term normal cost rate.

The minimum required contribution rate of 18.04% integrated is 1.32% higher than the current rate of 16.72% integrated. Under the Joint Trust Agreement, this increase in the required contribution rate must be shared between members and employers. This represents an increase of 0.66% of salaries each, for a total Basic contribution rate of 18.04% integrated.

## Combined Basic plus IAA Contribution Rates

When the Basic contributions are combined with the existing IAA rates, the revised totals become:

	Member	Employer	Total
Current Basic	8.31% <sup>1</sup>	8.41% <sup>1</sup>	16.72% <sup>1</sup>
Plus new Basic	0.66%	0.66%	1.32%
Current IAA	1.38%	1.38%	2.76%
<b>Total</b>	<b>10.35%<sup>1</sup></b>	<b>10.45%<sup>1</sup></b>	<b>20.80%<sup>1</sup></b>

<sup>1</sup> Integrated, i.e., less 0.75% of salaries up to the YMPE for each of member and employer.

The revised contribution rates comply with the requirements of the provincial pension standards legislation (i.e. the *PBSA*).

With regard to the *Income Tax Act (ITA)*, there is a requirement that individual member contributions not exceed the lesser of 9% of salaries or \$1,000 plus 70% of the pension credit, though this condition may be waived by the Minister of Finance provided members do not contribute more than half the cost of benefits. The required contributions exceed 9% of salaries so it will be necessary to apply to the Minister for an exemption. The employer contributions of 10.45% exceed the member contributions of 10.35% and therefore, after taking into account the JTA requirement that contribution rate changes are shared equally between members and employers, the requirement that the member contributions will not exceed half of the amount required to fund the aggregate benefits is met. The plan has applied for and been granted the waiver following the 2009 valuation.

### **Sustainable Indexing Valuation**

The Sustainable Indexing Valuation shows that indexing of 1.83% per year is sustainable in the long term. This is unchanged from the sustainable indexing level established at the 2009 valuation.

The fact that the sustainable indexing level has not deteriorated may appear to be at odds with the Basic Valuation result, which showed a worsening of the financial position from 2009 to 2012 and a 1.32% of pay increase in the required contribution rate. The reasons for this outcome are discussed in the report.

The College Pension Board of Trustees,  
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## I. Scope of the valuation

In accordance with Section 12 the Joint Trust Agreement (the "JTA")<sup>1</sup> and on the instructions of the College Pension Board of Trustees (the "Board of Trustees"), we completed an actuarial valuation of the Basic Account and the Inflation Adjustment Account of the College Pension Plan (the "Plan") as at August 31, 2012 and are pleased to submit this report thereon. The primary purpose of this valuation is to determine the financial position of the Basic Account as at August 31, 2012 and to report on the adequacy of the member and employer contribution rates.

Two primary valuations were carried out:

- **A Funding Valuation** - to determine the financial position of the Basic Account as at August 31, 2012 and to report on the adequacy of the member and employer contribution rates. The Funding Valuation focuses only on the Basic Account and does not examine projections of the Inflation Adjustment Account ("IAA") and its ability to meet future indexing requirements. Furthermore, it ignores the limits on benefits imposed by the *Income Tax Act* ("ITA") on registered pension plans - such excess benefits are paid on a current cash basis through the Supplemental Benefits Account, which is maintained at a zero balance; and
- **A Sustainable Indexing Valuation** - to determine the rate of indexing that can be sustained in the long term, based on the financial position of the Basic Account and the Inflation Adjustment Account, and the overall level of contributions to the plan.

In addition to the above, we have performed supplementary funding valuations as follows:

- For basic and indexed benefits, on the presumption that indexed benefits are to be fully funded, in advance, as for basic benefits; and
- Limiting benefits to those permitted under the *ITA*; this is done both for basic benefits only, and for basic plus indexed benefits.

The intended users of this report are The Board of Trustees, the Financial Institutions Commission of British Columbia ("FICOM") and Canada Revenue Agency ("CRA"). This report is not intended or necessarily suitable for other purposes than those listed above.

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<sup>1</sup> The JTA was signed on April 4, 2011 and became effective on June 22, 2012. It incorporates the joint trust arrangements previously covered in Schedule A of the *Public Sector Pension Plans Act*.

## II. Changes in plan

The last valuation of the Plan, prepared as at August 31, 2009 and included in our report dated May 13, 2010, determined the financial position of the Plan as amended to August 2009. Since then, a number of changes have been made to the Plan. The major changes affecting the Plan's financing include:

- Effective September 1, 2010, member contribution rates to the Basic Account were increased to 7.56% of pensionable salary up to the Yearly Maximum Pensionable Earnings ("YMPE") and 8.31% on pensionable salary above the YMPE;
- Effective September 1, 2010, employer contribution rates were increased to 7.66% of pensionable salary up to the YMPE and 8.41% on pensionable salary above the YMPE; and
- Effective September 1, 2010, member and employer IAA contribution rates were increased to 1.38% of pensionable salary each.

There were no other benefit changes that had a material financial impact on the Plan.

The changes, and the main provisions of the Plan, are described in Appendix A.

### III. Actuarial methods and assumptions

#### 1. Funding Criteria

In any pension system, the rates of member and employer contribution should be such that:

- the present value of all future contributions at those rates
- equals the present value of all future benefits
- minus the funds on hand.

There are numerous financing methods that will satisfy this equation. At one end is the pay-as-you-go or current disbursement method; under this method, contributions are limited to those necessary to finance current benefit disbursements, so that no assets are accumulated. At the other end is the achievement of full funding within a reasonable period; this results in the accumulation of substantial assets. The criteria used in establishing the appropriate level of contributions to the College Pension Plan include the following:

- (i) **benefit security** - the probability of fulfilling the present benefit promises provided in the Plan depends on a mixture of political, economic and financial factors; but, whatever the probability, obviously benefit security would be enhanced with a larger accumulation of assets.
- (ii) **stability of contributions** - the financing system should result in contribution rates that are relatively stable over an extended period of time.
- (iii) **intergenerational equity** - as far as is practicable, pension indexing costs should be allocated to the generation that incurs them; there is no assurance that future generations will assume the burdens transferred to them by prior generations.

The Board's approach to dealing with above objectives is outlined in their funding policy. We have taken this into account in this valuation.

#### 2. Funding Valuation and Adequacy of Contribution Rates

The Funding Valuation is primarily carried out to assess the financial position of the Basic benefits of the plan and to report on the adequacy of the Basic contribution rates. Our approach to this is as follows:

##### **(a) Basic Account Valuation - Current Financing**

We determined the financial status of the Plan for the Basic Account only (i.e. ignoring any indexing granted after August 31, 2012). The methods used are described in Appendix B.

**(b) Funding Requirements**

The approach taken in this valuation (set out in the following sections) has taken into account the Board's funding policy as well as the requirements of the JTA.

**(c) Normal Cost and Amortization of Surplus or Unfunded Liability**

An entry-age funding approach is used. As a first step, contributions are calculated as the level, long-term rate of pay required to finance the benefits of new entrants to the Plan over their working lifetimes, so that their projected benefits are fully secured by equivalent assets by the time they retire (the "normal cost rate" or the "entry-age rate"). Thus, to the extent actuarial assumptions are realized, the addition of new entrants to the Plan should generate neither unfunded liabilities nor surpluses.

Next, the funded position of the plan at the valuation date is considered. The liability takes into account benefits earned to the valuation date as well as benefits expected to be earned for future service by existing members. Asset values are taken at smoothed market values for existing assets, plus projected future contributions in respect of the existing members at the entry-age normal rates, plus the value of the amortization amounts established at previous valuations. The resulting net financial position may be either an actuarial surplus or an unfunded actuarial liability.

This surplus, or unfunded liability, is amortized over a specified period as outlined in the funding policy, e.g., 25 or 15 years. Contributions, expressed as a percentage of payrolls, revert to the normal cost rate after the unfunded liability or surplus has been amortized.

**(d) PBSA Requirements**

The *Pension Benefits Standards Act* ("*PBSA*") imposes certain minimum funding requirements on pension plans registered in British Columbia. These include the determination of a plan's financial position on a solvency basis as well as the more usual going-concern basis, the amortization of unfunded actuarial liabilities over a maximum of 15 years, and special rules regarding the treatment of surplus. While the College Pension Plan is one of a number of British Columbia public sector plans that are exempt from these provisions, the current joint trusteeship arrangement requires that the Plan's financing comply with the *PBSA* requirements for a going-concern valuation. This report therefore complies with the going-concern valuation requirements of the *PBSA*.

**(e) Test Contribution Adequacy**

Under the *PBSA* going-concern requirements, the employers and the members must contribute the full normal actuarial cost (e.g. the "entry-age rate" described in (c) above). In addition, any previously identified unfunded liabilities must be amortized over not more than the remaining portion of their respective 15 year

amortization periods and any "new" unfunded liabilities must be amortized over not more than 15 years.

Surpluses may be applied to reduce the contribution requirements from the previously set level. With respect to the employer share of the requirements, the rate may only be reduced below the normal actuarial cost after a surplus margin of 5% of liabilities has been set aside, with the remaining surplus to be amortized over not less than 5 years. The Board sets out its policy with regard to amortization of surplus in its funding policy.

The Board's funding policy reflects these constraints and, accordingly, we have calculated theoretical contribution requirements as follows:

- Calculate the "normal cost rate" (i.e. the "entry-age rate");
- Calculate the surplus (or unfunded liability) using this rate, after taking into account the value of additional contributions required to amortize unfunded liabilities identified at previous valuations;
- If there is an unfunded liability, amortize the balance over 15 years from the current valuation date. If there has been a gain since the last valuation, i.e. the currently scheduled amortization rates applied for the balance of the previously established amortization periods are more than sufficient to amortize the previously identified unfunded liabilities; apply the gain to amortize or reduce the previously identified unfunded liabilities, starting with the oldest established. This results in a reduction in the required amortization rates, with the revised rates in effect for the previously established periods; and
- If, after removing all previously established amortization amounts there is a surplus, amortize it over periods of 15 or 25 years. These two figures provide a range of surplus usage in order to stabilize contribution rates over an extended period. If the existing contribution rate exceeds the 25 year requirement, then contributions may be reduced, or benefits improved, to this level; if the existing rate is below the 15 year requirement, then contribution rates must be increased; otherwise, the existing rates may continue, unchanged.
- The foregoing rates are, of course, subject to being compatible with the *PBSA* minimum requirements.

The JTA requires any contribution rate changes, up or down, to be shared equally by the members and the employers. Thus, we express the future cost requirements as a combined member-plus-employer amount.

### **3. Sustainable Indexing Valuation**

The Sustainable Indexing Valuation is carried out to establish the maximum level of indexing that can be provided over the period until the next valuation in a manner that allows indexing to be sustained in the long term and is fair from the perspective of intergenerational equity.

As for the Funding Valuation, we have used an entry age approach. We start by calculating the long term contribution rate that is required to fund the benefits (including indexing at the target rate) over the life time of a typical new entrant, assuming the Plan has neither a surplus nor an unfunded liability.

Next, we need to calculate how this long term contribution rate should be adjusted to reflect the funded position of the Plan. The assets, consisting of the current funds plus the value of future contributions at this entry age rate, are compared to the liabilities (including the provision for indexing at the target rate). Subtracting the liabilities from the assets gives rise to a surplus or unfunded liability. We amortize this surplus or unfunded liability (in certain cases, adjusted as described below) over an infinite period to obtain the level long-term contribution that is required to support indexing at the target level.

For the target level of indexing to be sustainable, this long term contribution requirement must not exceed the long term contributions that are committed to be paid into the plan, while from an intergenerational equity perspective, we require the long term commitment and long term requirement to be equal.

The calculation of the long term contribution commitment is complicated by the fact that the members and employers are currently paying amortization amounts into the plan for a temporary period. We have therefore defined the long term contribution commitment as the normal cost of the current Basic benefits, plus the fixed IAA contributions. Effectively, these are the amounts that the members and employers can expect to pay in the absence of any unfunded liabilities or surplus.

We have excluded the Funding Valuation amortization requirements from the long term contribution commitment, as these amounts are only payable for a limited period of time. Instead, we have allowed for the effect of these amortization amounts by including their present value as an adjustment to the unfunded liability; the unfunded liability calculated in the Sustainable Indexing Valuation is thus reduced by the present value of the Funding Valuation required amortization amounts.

**4. Actuarial Assumptions**

The rates of investment return, salary increase, indexing, mortality, withdrawal, disability and retirement experienced by members of the fund were examined for the three year period ending on the valuation date, together with corresponding experience for earlier periods and with other assumptions affecting the valuation results. We discussed the implications of the assumptions, and changes to them, with the Board.

The assumptions and the approach to setting them are described in Appendix B. In summary, the Funding Valuation, used to set the Basic contribution rate, requires margins for adverse deviations, while it is appropriate to use best estimate assumptions when carrying out the Sustainable Indexing Valuation. As a result, certain key assumptions differ between the two valuations and two sets of assumptions are required. For ease of reference we refer to these as the Funding Valuation assumptions and the Sustainable Indexing Valuation assumptions.

Following discussions with the Board, we left the economic assumptions unchanged, we made some adjustments to the demographic and other assumptions. The assumptions are discussed in detail in Appendix B; the key economic assumptions are summarized below.

	<b>Funding Valuation</b>	<b>Sustainable Indexing Valuation</b>
Annual Investment Return	6.5% <sup>1</sup>	6.75% <sup>1</sup>
Annual Salary Increase	3.75% <sup>1</sup> plus seniority	3.50% <sup>1</sup> plus seniority
Annual Indexing	0% <sup>1</sup> for basic costs 3.0% <sup>1</sup> for indexed costs	2.75% <sup>2</sup> for fully indexed costs Sustainable level of indexing calculated as valuation output

Emerging experience differing from the assumptions will result in gains or losses which will be revealed in future valuations.

**5. Membership Data**

Data as of August 31, 2012 were prepared by the Pension Corporation. The data are described in detail in Appendix B and numerically summarized in Appendices C, D and E.

**6. Benefits Excluded**

No benefits have been excluded from the valuation.

<sup>1</sup> Unchanged from the previous valuation.

## IV. Report disclosure changes

In previous valuation reports, we showed results for the basic benefits in two different ways:

- **Current Contribution Basis:** Firstly, the funded position assuming contributions would continue at the current rate was calculated (this calculation included as an asset the value of future contributions assuming that the current rate would continue indefinitely). This result, which was disclosed in Schedule 1 of our previous reports, provided insight into the financial position of the Basic Account if contributions were to remain unchanged in the future.
- **Entry Age Basis:** Secondly, the funded position was calculated assuming that contributions would be equal in value to the value of contributions at the entry-age rate, plus scheduled future amortization amounts. This result, which was disclosed in Schedule 2 of our previous reports, established the financial position of the plan for the purposes of calculating the required contribution rate.

Prior to the move to Joint Trusteeship, the Current Contribution, or Schedule 1, result was important for setting the contribution rate. After the move to Joint Trusteeship, due to the requirement to fund according to the going-concern requirements of the *PBSA*, the Entry Age, or Schedule 2, result became more important, as it must be taken into account when setting the contribution rate. In addition, as there is no requirement to continue paying the current contribution rate indefinitely into the future, the information provided on the Current Contribution Basis (Schedule 1 in previous reports) is now less useful, especially as part of the current contribution rate is in respect of amortization amounts which are payable for 15 years or less, rather than indefinitely.

In an effort to simplify the report, and enhance understanding of the contribution rate setting process, we no longer show the Current Contribution result. This change to the report is purely a change in disclosure. The methods and process for setting the contribution rate has not changed.

The Entry Age result is now shown as Schedule 1. While we have removed the Current Contribution result from the body of the report, we have included it in Appendix H, so as to allow comparison to prior reports.

## V. Results of the Funding Valuation

### 1. Basic Account - Actuarial Position

Schedule 1 shows a statement of the actuarial position of the funding valuation of the Plan as at August 31, 2012. This statement ignores liabilities for future indexed supplemental pensions granted after the valuation date, and their financing, and assumes that member and employer contribution rates for basic pensions will be made at the entry-age normal cost rate i.e. 16.84% of payroll, plus the previously established amortization amounts totaling 0.06% of payroll currently scheduled to expire in 2021.

#### **Schedule 1 - Statement of Actuarial Position as at August 31, 2012<sup>1</sup>**

##### *Basic Account - Non-Indexed Benefits – Entry-age Normal Cost*

	(\$000's)	
<b>Assets</b>	<b>2012</b>	<b>2009</b>
Market Value of Basic Fund	2,598,671	2,056,187
Asset Smoothing Adjustment	(49,281)	146,270
Smoothed Value of Fund	2,549,390	2,202,457
Actuarial present values of:		
▪ Future contributions at entry-age rates	960,562	903,093
▪ Present value of existing amortization - 0.06% to 2021	3,576	4,115
<b>Total Assets</b>	<b>3,513,528</b>	<b>3,109,665</b>
<b>Liabilities</b>		
Actuarial present values for:		
▪ Pensions being paid	1,179,613	899,902
▪ Inactive members	172,621	167,263
▪ Active members	2,230,438	2,016,717
▪ Future expenses	36,252	25,783
<b>Total Liabilities</b>	<b>3,618,924</b>	<b>3,109,665</b>
<b>Surplus (Unfunded Actuarial Liability)</b>	<b>(105,396)</b>	<b>0<sup>2</sup></b>
<b>Funded Ratio: Total Assets ÷ Total Liabilities</b>	<b>97.1%</b>	<b>100.0%<sup>3</sup></b>

<sup>1</sup> The 2009 report referred to this schedule as "Schedule 2".

<sup>2</sup> The 2009 report showed a reduction in the unfunded liability to \$4.115 million. When amortized over the remaining balance of 12 years (to 2021) this resulted in an amortization requirement of 0.06%. Showing the amortization requirement as an asset reduces the unfunded liability to zero.

<sup>3</sup> Prior to allowance for the 2009 amortization requirement of 0.06%, the funded ratio for 2009 was 99.9%.

**2. Change in Actuarial Position**

The statement of actuarial position included in Schedule 1 indicates that a new unfunded liability of \$105 million has emerged since August 31, 2009. The \$105 million new unfunded liability is the net result of a number of items, the most significant items being lower than assumed investment returns and changes in the valuation assumptions, offset by lower than assumed salary increases.

**Schedule 2 - Change in Actuarial Position**

	<b>Approximate effect (\$ millions)</b>
1. Unfunded liability at August 31, 2009 <sup>1</sup>	<b>0</b>
2. Actual income from investments lower than 6.5% assumed rate (on smoothed values)	(167)
3. Actual contributions lower than previously assumed	(4)
4. Actuarial salary increases to August 31, 2012 lower than previously assumed	91
5. Changes in valuation assumptions	(29)
6. Other factors (a net gain) including changes in plan membership and other differences between actuarial assumptions and actual experience during the intervalation period	4
<b>7. Unfunded liability at August 31, 2012</b>	<b>(105)</b>

The \$29 million loss due to changes in actuarial assumptions (shown in item (5)) is the net result of the following (the assumption changes are described in Appendix B):

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<sup>1</sup> After allowing for amortization of 0.06% of pay for 15 years.

**Change in Actuarial Position Arising from Change in Actuarial Assumptions**

<b>Assumption change</b>	<b>Approximate effect (\$ millions)</b>
Benefit assumed chosen on pre-retirement death <sup>1</sup>	(2)
Pre-retirement mortality	0
Disability incidence rate	0
Withdrawal rates	0
Retirement rates	4
Post-retirement mortality	(29)
Post-retirement mortality for disabled pensioners	(2)
<b>Total</b>	<b>(29)</b>

**3. Adequacy of Contribution Rates**

As discussed previously in Section III, the required contribution rate consists of the normal cost plus an adjustment to amortize any surplus or unfunded liability. These components of the required contributions are discussed in more detail below.

**(a) Normal Cost Rate**

The current service contribution, inclusive of contributions by members, required to finance the basic pensions of new entrants (i.e. the normal actuarial cost) has increased from 16.66% of salaries as at August 31, 2009 to 16.84% of salaries as at August 31, 2012.

The 0.18% increase in normal cost rate is developed in Appendix F and is the net result of a number of items, the most significant being the change in the mortality assumption (cost increase of 0.15%) plus the increased expense allowance (cost increase of 0.15%), partly offset by the change in withdrawal rates (cost decrease of 0.13%).

**(b) PBSA Minimum Rate**

Since the Plan has an unfunded liability, the PBSA funding requirements must be applied in calculating the required contribution rate. The PBSA requires that any previously established unfunded liabilities continue to be amortized over the remaining balance of their 15 year terms at the rate originally calculated when the

<sup>1</sup> Prior valuations assumed that the spouses of members dying prior to retirement, but after the age of 55, would take the default death benefit. Considering the fact that spouses could waive this benefit and thereby obtain a higher benefit, based on the commuted value of the pension earned to the date of death, to be paid to the member's estate, caused us to review this assumption and assume that the more valuable benefit would be chosen. Subsequent to our decision to value the more valuable benefit, the plan was amended so that the default became the commuted value.

unfunded liability was established. Any unfunded liability remaining after the existing amortization requirements are taken into account must be amortized over 15 years. If there is a surplus after the existing amortization requirements are taken into account, the existing amortization rates may be reduced, starting with the oldest established.

The present value of the amortization requirements identified in 2006 and, payable since 2009<sup>1</sup> at a rate of 0.06% of salaries until 2021, is \$3,576,000. After taking this into account, there is a remaining unfunded liability balance of \$105,396,000. Amortizing this over 15 years results in an additional amortization requirement of 1.14% of salaries. Adding these two results in a total amortization requirement of 1.20% of salaries.

The minimum PBSA requirement is therefore equal to the normal cost of 16.84% plus the amortization requirement of 1.20% for a total contribution rate of 18.04% of salaries (integrated).

The current contribution rates, the contribution rates for current service (on an entry-age basis, i.e. the normal actuarial cost), and the amortization of the resulting unfunded liability are summarized in Schedule 3. Each of these items is discussed in more detail in the ensuing pages. From 2000 onwards, the JTA (and its predecessor in Schedule A of the *Public Sector Pension Plans Act*) requires that any increase or decrease in contribution rates is to be shared equally between members and employers.

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<sup>1</sup> In 2006, the amortization requirement was 0.08% of salaries. Following the 2009 valuation, this was reduced to 0.06% of salaries, as the original rate exceeded the PBSA requirement.

**Schedule 3 - Current and Required Basic Contribution Rates**

	Based on valuation results as at August 31	
	2012 (%)	2009 (%)
<b>Current contribution rates</b>		
Member <sup>1</sup>	8.31	8.12
Employer <sup>1</sup>	8.41	8.12
<b>Combined member/employer<sup>1</sup></b>	<b>16.72</b>	<b>16.24</b>
<b>Required contribution rates</b>		
Entry-age normal cost rate <sup>1</sup>	16.84	16.66
Amortization of unfunded actuarial liability (surplus)		
▪ 25 year amortization	0.80	0.03
▪ 15 year amortization	1.18	0.05
▪ <i>PBSA</i> amortization		
to 2021	0.06	0.06
to 2027	1.14	
<b>Total <i>PBSA</i> amortization</b>	<b>1.20</b>	<b>0.06</b>
<b>Total contribution rate<sup>1</sup></b>		
▪ 25 year amortization	17.64	16.69
▪ 15 year amortization	18.02	16.71
▪ <i>PBSA</i> rate	18.04	16.72
<b>Total required contribution rate<sup>1</sup></b>	<b>18.04</b>	<b>16.72</b>

The above results indicate a total required contribution rate of 18.04% of salaries compared to the current rate of 16.72%, i.e. the current rate must be increased by 1.32% of salaries over its current level.

<sup>1</sup> Less 0.75% of salary up to the YMPE (for each of the members and the employers) and exclusive of contributions required for indexed supplementary pensions.

**4. Revised Contribution Rates**

The JTA requires any contribution rate changes, up or down, to be shared equally by the members and the employers.

The required contribution rate for basic, non-indexed benefits indicated by this valuation is 18.04% of salaries (integrated). This compares to a current contribution rate of 16.72% of salaries (integrated). Thus the current rates need to be increased by 1.32% of salaries. After dividing by two, the required increase is 0.66% of salaries each for the members and the employers.

When this is combined with the current IAA contribution rates, the revised rates become:

**Schedule 4 - Current and Required Total Contribution Rates**

	<b>Member</b>	<b>Employer</b>	<b>Total</b>
Current Basic <sup>1</sup>	8.31%	8.41%	16.72%
Plus new Basic	0.66%	0.66%	1.32%
<b>Total Basic Rate<sup>1</sup></b>	<b>8.97%</b>	<b>9.07%</b>	<b>18.04%</b>
Current IAA Rate	1.38%	1.38%	2.76%
<b>Total Contribution Rate<sup>1</sup></b>	<b>10.35%</b>	<b>10.45%</b>	<b>20.80%</b>

Under the *JTA*, there is a requirement that individual member contributions may not exceed the lesser of:

- (a) 9% of salary, or
- (b) \$1,000 plus 70% of the member's pension credit

although these conditions may be waived by the Minister of Finance provided that the contributions are "determined in a manner acceptable to the Minister and it is reasonable to expect that, on a long-term basis, the aggregate of the regular current service contributions made under the provision by all members will not exceed 1/2 of the amount that is required to fund the aggregate benefits in respect of which those contributions are made."

The required contribution rate of 9.60% of salary up to the YMPE and 10.35% of salary above the YMPE exceeds this limit, so it is necessary to apply to the Minister for exemption. The employer contributions of 10.45% exceed the member contributions of 10.35% and therefore, after taking into account the JTA requirement that contribution rate changes are shared equally between members and employers, the requirement that the member contributions will not exceed half of the amount required to fund the aggregate benefits is met. A similar exemption was required, and obtained, following the 2009 valuation.

<sup>1</sup> Integrated, i.e., less 0.75% of salaries up to the YMPE, for each of the members and employers.

**5. Other Plan Changes**

Since the Funding Valuation does not show a surplus, the Board may not consider any of the other contribution or benefit changes.

**6. Accrued Benefits - Funded Ratio**

Another index of funding some readers of the report may want to examine is the funded ratio. The funded ratio is calculated by dividing the Basic Account assets by the total liability for benefits accrued in respect of service to the valuation date. The asset/liability comparison is analogous to that in Schedule 1, except that contributions and benefits in respect of future service to be worked by existing members are excluded from the comparison. The results are shown below.

**Schedule 5 - Accrued Benefits – Funded Ratio at August 31, 2012<sup>1</sup>**

*Basic Account – Non-Indexed Benefits*

	(\$000's)	
	2012	2009
<b>Fund (Basic Account): Smoothed value of assets</b>	<b>2,549,390</b>	<b>2,202,457</b>
<b>Accrued Liabilities</b>		
▪ for pensions being paid	1,179,613	899,902
▪ for inactive members	172,621	167,263
▪ for active members	1,218,996	1,061,763
<b>Total Accrued Liabilities</b>	<b>2,571,230</b>	<b>2,128,928</b>
<b>Surplus (Unfunded Actuarial Liability): accrued service only</b>	<b>(21,804)</b>	<b>73,529</b>
<b>Funded Ratio: Fund ÷ Total accrued liabilities</b>	<b>99%</b>	<b>103%</b>

The above schedule indicates that the funded ratio for accrued benefits has deteriorated from about 103% to 99%. This is largely for reasons similar to the items in the analysis in Schedule 2, but excluding those items related to future contribution rates.

**7. Sensitivity Analysis**

**Sensitivity Analysis under Standards of Practice**

The Canadian Institute of Actuaries Practice-Specific Standards for Pension Plans require disclosure of the effect of using a discount rate (investment return) 1.0% lower than that used for the valuation on:

- (a) The actuarial present value, at the calculation date, of projected benefits allocated to periods up to the calculation date, and

<sup>1</sup> The 2009 report referred to this schedule as "Schedule 4".

- (b) The service cost or the rule for calculating the service cost between the calculation date and the next calculation date.

The table below shows the impact on the accrued liability as required by (a) and the entry-age normal cost as required by (b) as at August 31, 2012 of a one percentage point drop in the discount rate assumption. All other assumptions were kept unchanged.

**Sensitivity – Impact of 1% drop in investment return on Accrued Benefits and Normal Cost**

	From 6.5% to 5.5%
Increase in Accrued Liabilities (\$000)	\$335,970
Increase in Entry Age Normal Cost as percentage of pay	3.17%

**Sensitivity Analysis for Plan Funding**

Given that the plan is funded on the entry-age basis, we have also considered the impact of a one percentage point drop in the investment return assumption on the Basic Account non-indexed benefits consistent with Schedule 1. These figures are summarized in the table below:

**Sensitivity – Impact of 1% drop in investment return on Plan Funding**

	(\$000's)		
	6.5%	5.5%	Increase
Smoothed Value of Fund	2,549,390	2,549,390	0
Actuarial present values of:			
▪ Future contributions at entry-age rates	960,562	1,226,943	266,381
▪ Present value of existing amortization	3,576	3,726	150
<b>Total Assets</b>	<b>3,513,528</b>	<b>3,780,059</b>	<b>266,531</b>
<b>Total Liabilities</b>	<b>3,618,924</b>	<b>4,220,470</b>	<b>601,546</b>
Surplus/(Unfunded liability) on entry-age basis	(105,396)	(440,411)	(335,015)
Entry Age Normal Cost	16.84%	20.01%	3.17%
PBSA Amortization	1.20%	4.53%	3.33%
PBSA Minimum rate – Schedule 3	18.04%	24.54%	6.50%

## 8. Supplementary Funding Valuations

Results analogous to those in Schedules 1, 3 and 5 are shown in Appendix G, on the following bases:

- for basic and indexed benefits combined, on the assumption that indexed benefits are to be fully funded, in advance, as for basic benefits;
- for basic only, and basic plus indexed benefits, including only benefits accrued to the valuation date; and
- limiting benefits to those permitted under the *Income Tax Act*; this is done both for:
  - basic benefits only; and for
  - basic plus indexed benefits.

The adjustments to the assumptions are discussed in Appendix B. The fully indexed funding valuation result takes into account IAA contributions of 1.38% from each of members and employers. The key results are summarized below:

**Schedule 6 - Indexed Benefits (no tax limits)**

Funded position	Basic Only	Basic + Indexed
	(\$000's)	(\$000's)
Smoothed Value of Fund	2,549,390	2,867,567
Actuarial present values of:		
▪ Future contributions at entry-age rates	960,562	1,333,358
▪ Present value of existing amortization requirements		
(i) 0.06% to 2021	3,576	3,576
Total Assets	3,513,528	4,204,501
Total Liabilities	3,618,924	4,999,623
<b>Surplus (Unfunded Liability) including existing amortization</b>	<b>(105,396)</b>	<b>(795,122)</b>
Present value of existing amortization	0	(3,576)
<b>Surplus (Unfunded Liability) to be amortized over 15 years</b>	<b>(105,396)</b>	<b>(798,698)</b>
<b>Contribution Rates (Integrated)</b>	<b>%</b>	<b>%</b>
Member – revised, as shown in Schedule 4	8.97	10.35
Employer – revised, as shown in Schedule 4	9.07	10.45
<b>Total – revised, as shown in Schedule 4</b>	<b>18.04</b>	<b>20.80</b>
Entry-age normal cost	16.84	23.01
Amortization <sup>1</sup>	1.20	8.66
<b>Total – entry-age</b>	<b>18.04</b>	<b>31.67</b>

If assets and liabilities are restricted to accrued service only, i.e. analogous to Schedule 5 earlier, the 2012 surplus (unfunded liability) figures change as follows:

**Schedule 7 – Indexed Accrued Benefits (no tax limits) – Funded Ratio at August 31, 2012**

	(\$000's)	
	Basic Only	Basic + Indexed
Assets	2,549,390	2,867,567
Liabilities	2,571,230	3,553,779
Surplus (Unfunded Liability)	(21,840)	(686,212)
Funded Ratio	99%	81%

**Benefits Limited to ITA Maximums**

When the income tax limits on benefits are recognized, the above unfunded liabilities and normal cost rates change marginally. The key results are summarized below.

<sup>1</sup> Basic amortization is as required by the PBSA; Basic + Indexed amortization is over 15 years.

**Schedule 8 – Benefits Limited to ITA Maximums – Basic Only**

Basic Only	No Tax Limit	With Tax Limit
Surplus (Unfunded Liability)	\$000's	\$000's
Entry Age Basis (including scheduled amortization)	(105,396)	(96,986)
Accrued Service Only (no scheduled amortization)	(21,840)	(12,015)
Contribution Rate	%	%
Entry-age normal cost	16.84	16.78
PSBA Amortization	1.20	1.11
<b>Total</b>	<b>18.04</b>	<b>17.89</b>

**Schedule 9 – Benefits Limited to ITA Maximums – Indexed Benefits**

Basic and Indexed	No Tax Limit	With Tax Limit
Surplus (Unfunded Liability)	(\$000's)	(\$000's)
Entry Age Basis (including scheduled amortization)	(795,122)	(782,897)
Entry Age Basis (excluding scheduled amortization)	(798,698)	(786,473)
Accrued Service Only (no scheduled amortization)	(686,212)	(672,807)
Contribution Rate	%	%
Entry Age Normal Cost	23.01	22.94
15 year Amortization	8.66	8.53
<b>Total</b>	<b>31.67</b>	<b>31.47</b>

## 9. Test Maximum Surplus and Contributions for Tax Purposes

Section 147.2(2) of the *Income Tax Act* limits employer contributions that may be made to a plan if there is a surplus and it exceeds a certain amount - the plan becomes revocable if contributions are made when such surplus exists. Since the Plan has an unfunded liability, this restriction does not apply.

The tax rules also require that employer contributions not exceed the normal cost rate plus amounts necessary to amortize an unfunded liability.

Subsection (c) of Section 147.2(2) of the *Income Tax Act* also provides that the benefits taken into account for the purposes of a contribution recommendation "may include anticipated cost-of-living and similar adjustments where the terms of a pension plan do not require that those adjustments be made but it is reasonable to expect that they will be made".

Indexing at full CPI was provided from January 1, 1982 to January 2011 under the present Plan terms, and for many years before that under earlier Plan provisions. As discussed earlier, the plan has moved to a sustainable indexing basis effective January 2011, whereby indexing is limited based on the financial position of the plan at the most recent valuation. Under this approach, if the contribution levels supported it, full indexing in line with increases in the cost of living would be provided. Thus, it is appropriate for purposes of testing the *ITA* 147.2(2) limits to recognize, in advance, the future indexing of pensions for the present Plan membership. On this basis, the valuation results on the fully indexed basis, recognizing the income tax limits on benefits, apply.

Thus, on the premise that it is appropriate for the Plan to recognize future indexing for the purposes of testing the *ITA* contribution limits, there is a significant unfunded liability, and furthermore, the required contribution rates are lower than the fully indexed normal cost rate. In other words, without even considering any amortization of the unfunded liability, the required rates are acceptable under the *ITA* and contributions may be increased to 20.80%.

We have commented previously (under section 4) on the 9% limit that applies to individual member contributions.

## VI. Sustainable indexing valuation

The Sustainable Indexing Valuation establishes the level of indexing that can be sustained in the long term taking into account the assets of the plan and the long term funding commitment to the Plan. The valuation basis is different from the Funding Valuation basis as discussed in Section III and Appendix B.

### 1. Long Term Funding Commitment and Amortization Requirements

Based on the results discussed in Section IV, the contribution requirements of the plan can be summarised as:

<b>Long Term Funding Commitment</b>	<b>2012</b>
Normal (entry-age) actuarial cost	16.84%
IAA contributions	2.76%
<b>Long term funding commitment - excluding current amortization schedule</b>	<b>19.60%</b>

The amortization requirement is 0.06% of salaries for 9 years and 1.14% of salary for 15 years. As discussed in Section III above, we have reflected the impact of the amortization payments through an adjustment to the unfunded liability, rather than through the long term funding commitment.

### 2. Results

We have calculated that the 2012 sustainable indexing level to be 1.83% per year. This result is unchanged from the equivalently calculated 2009 sustainable indexing level.

Allowing for indexing of 1.83% per year, and using the sustainable indexing assumptions discussed earlier, we obtain the following balance sheet and contribution requirements:

	<b>2012</b>
	<b>(\$000's)</b>
<b>Sustainable Indexing Target</b>	<b>1.83%</b>
<b>Assets</b>	
Market Value of Fund	2,922,998
Asset Smoothing Adjustment	(55,431)
Smoothed Value of Fund	2,867,567
Actuarial present values of contributions at Entry Age Normal Cost <sup>1</sup>	1,060,895
<b>Total Assets</b>	<b>3,928,462</b>
<b>Total Liabilities</b>	<b>4,165,844</b>
<b>Surplus (Unfunded Actuarial Liability)</b>	<b>(237,382)</b>
Add value of <i>PBSA</i> basic amortization requirement 0.06% to 2021	3,504
Add value of <i>PBSA</i> basic amortization requirement 1.14% to 2027	101,699
<b>Adjusted surplus</b>	<b>(132,180)</b>
<b>Contribution Requirements</b>	<b>%</b>
Entry Age Normal Cost - based on sustainable indexing target	19.05
Amortization of adjusted surplus over infinite period	0.55
<b>Required contribution</b>	<b>19.60</b>
<b>Long term contribution commitment</b>	<b>19.60</b>

The above results show that, at an indexing rate of 1.83% per year, the required contribution rate is 19.60% of pay, which is equal to the long term contribution commitment. It is thus reasonable to conclude that indexing of 1.83% per year can be sustained in the long term. We recommend that the maximum indexing amount referred to in Section 73 of the plan rules be set at not more than 1.83% per year. This is unchanged from the level set following the 2009 valuation.

The fact that the sustainable indexing level has not deteriorated may appear to be at odds with the Basic Valuation result, which showed a worsening of the financial position from 2009 to 2012 and a 1.32% of pay increase in the required contribution rate. There are three main reasons for this:

- Firstly, the losses on the Basic Account are offset by the increase in the Basic Account required contribution rate.

<sup>1</sup> This allows for indexing at 1.83% and reflects a 6.75% discount rate.

- Secondly, the asset smoothing limit for sustainable indexing was set at 105% of market value as opposed to the asset smoothing limit for funding purposes of 110%. This means that more of the poor investment returns prior to August 2009 were already recognized in the 2009 sustainable indexing result than in the 2009 funding result. The subsequent smoothed investment returns since 2009 on the sustainable indexing basis were therefore higher than the smoothed investment returns on the funding basis. The tables below illustrate this effect for the Basic and IAA combined.

**Summary of Asset Values - \$000**

	<b>Funding Basis</b>	<b>Sustainable Indexing Basis</b>
Market Value of Assets as at August 31, 2009	2,312,069	2,312,069
Asset smoothing	164,473	115,603
<b>Smoothed Value of Assets as at August 31, 2009</b>	<b>2,476,542</b>	<b>2,427,672</b>
Market Value of Assets as at August 31, 2012	2,922,998	2,922,998
Asset smoothing	(55,431)	(55,431)
<b>Smoothed value of Assets as at August 31, 2012</b>	<b>2,867,567</b>	<b>2,867,567</b>

**Smoothed Investment Returns - \$000**

	<b>Funding Basis</b>	<b>Sustainable Indexing Basis</b>
Smoothed value of assets as at August 31, 2009	<b>2,476,542</b>	<b>2,427,672</b>
Non-Investment cashflow	57,187	57,187
Smoothed investment return	333,838	382,708
Smoothed value of assets as at August 31, 2012	<b>2,867,567</b>	<b>2,867,567</b>
<b>Smoothed investment return % per year</b>	<b>4.25%</b>	<b>4.95%</b>

Thus, as demonstrated above, the investment return on the sustainable indexing basis is higher than the investment return on the funding basis and after taking into account the investment return assumptions for the two bases, the corresponding investment losses are smaller.

- Thirdly, there are indexing gains on the sustainable indexing basis as the actual indexing granted (0%, 1.7% and 1.83%) was less than the 1.83% per year assumed at the last valuation.

Therefore, the Basic account contribution rate increase is more than sufficient to cover the Basic account's share of the losses on the sustainable indexing basis. In addition, the excess is sufficient to cover the IAA share of the losses on the sustainable indexing basis. As a result the net position on the sustainable indexing basis did not deteriorate and the level of sustainable indexing can be maintained.

The sustainable level of indexing will be re-evaluated at the next valuation and is likely to differ from the current level as a result of ongoing experience gains or losses and any changes to the valuation assumptions at that time.

## **VII. Subsequent events**

To the best of our knowledge, there are no material subsequent events that would affect the results and recommendations of this valuation. Any investment experience occurring between the valuation date and the report date, which differs from the assumption made, is not reported on in this valuation report and will be reported on in future valuations.

## VIII. Actuarial opinion

In our opinion,

- (a) the membership data on which the valuation is based are sufficient and reliable for the purposes of the valuation,
- (b) the assumptions are appropriate for the purposes of the valuation, and
- (c) the methods employed in the valuation are appropriate for the purposes of the valuation.

This report has been prepared and our opinions given in accordance with accepted actuarial practice in Canada. Pursuant to the JTA and other regulatory requirements, the next valuation should be completed no later than as of August 31, 2015.

## IX. Acknowledgement

We gratefully acknowledge the generous assistance of the staff of the Pension Corporation in the preparation of the data and other items required for this report.

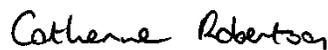
Respectfully submitted,



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May 21, 2013

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<sup>1</sup> Primary regulator

## Appendix A: Summary of Plan and Amendments as at August 31, 2012

### Changes to the Plan

The previous valuation was based on the provisions of the Plan as at August 31, 2009. Since then, the Plan has been amended a number of times. The changes are summarized below.

- effective retroactive to January 1, 2004, a housekeeping amendment was made to the definition of “refund interest rates” in section 96(1) of the Regulation to update the CANSIM interest rate identifier;
- effective December 9, 2009, various sections of the Regulation were amended or repealed, as follows:
  - Sections 9 and 19 were amended to clarify that if an active member applies to purchase a period of arrears or a leave of absence and does not pay the required amount by the payment deadline, the member may only purchase the service if they reapply before the application deadlines;
  - Section 19 was amended to clarify that an application to purchase a leave of absence period must be made before a member terminates employment with the employer with which the leave occurred;
  - Section 16 was amended to reflect all leave of absence types for which the *Employment Standards Act* requires employers to pay their portion of the contributions if a member elects to purchase a period of leave;
  - Sections 26, 27 and 28 were repealed to remove expired provisions for purchasing non-contributory service for periods before September 1, 1999;
  - Section 96(1), was amended by repealing the redundant definition of “Interplan Pension Transfer Agreement”;
- effective January 1, 2010, section 69(3) was amended to make the method used to calculate pre-retirement death benefits (PRDB) for the surviving spouse of a member who dies after the earliest retirement age consistent with the method used for other PRDB beneficiaries;

- effective September 1, 2010, member and employer contribution rates were amended as follows:
  - member contribution rates increased from 7.37% to 7.56% of salary for earnings up to the YMPE, and from 8.12% to 8.31% for earnings above the YMPE for contributions to the Basic Account;
  - employer contribution rates increased from 7.37% to 7.66% for earnings up to the YMPE, and from 8.12% to 8.41% for earnings above the YMPE for contributions to the Basic Account;
  - member and employer IAA contribution rates both increased by 0.04% of pensionable salary each, from 1.34% to 1.38%;
- effective September 1, 2010, section 73 was amended to change the annual cost-of-living adjustment (COLA) calculation methodology to the annual averaging method used by the Canada Pension Plan; COLA will now be based on annual changes in the average CPI for the period November to October, subject to the sustainable indexing cap;
- effective January 1, 2011, sections 9, 13 and 19 were amended to provide members an additional 30-day period after termination of employment to apply to purchase service;
- effective March 20, 2012, section 55 was amended to clarify that a member who qualifies for a 3 per cent pension reduction factor at termination of employment or retirement must not have a higher reduction factor applied to their pension after becoming re-employed and re-enrolling in the plan;
- effective June 22, 2012, BC Order in Council No. 463 repealed the College Pension Plan Regulation, B.C. Reg. 95/2000, and brought into force amendments to the *Public Sector Pension Plans Act* (PSPPA), implementing the JTA and the College Pension Plan Rules made under the agreement.

The main provisions of the Plan taken into account in the valuation as at August 31, 2012, are summarized below. Except as otherwise noted, the section references are to the College Pension Plan Rules as at August 31, 2012.

**Employer and Employee Eligibility**

The Plan applies to a body designated under the *College and Institute Act*, and to any other body designated as an employer, on terms and conditions of eligibility specified by the Board. [Section 2]

Participation is compulsory for all members of the senior administrative staff and staff providing educational services (including librarians) who are full-time or who earn more than 50% of the YMPE under the Canada Pension Plan in any calendar year. Enrolment is optional for eligible staff who are part-time and have not yet earned 50% of the YMPE in a calendar year; enrolment is also optional for educational staff who were hired before September 1, 1999. [Section 3]

**Member Contributions**

Section 5 defines the following contributions which are deducted from a member's salary during a calendar year:

- (a) 7.56% of that part of the member's cumulative salary that does not exceed the YMPE (paid into the Basic Account);
- (b) 8.31% of the member's cumulative salary that is in excess of the YMPE (paid into the Basic Account);  
and
- (c) 1.38% of the member's entire salary (paid into the Inflation Adjustment Account).

Previously, member contributions ceased after 35 years of pensionable service have been accrued. This limit was removed effective September 1, 2009.

**Employer Contributions**

Section 6 requires every employer to contribute the following amounts during a calendar year:

- (a) 7.66% of that part of a member's cumulative salary that does not exceed the YMPE (paid into the Basic Account);
- (b) 8.41% of the member's cumulative salary that is in excess of the YMPE (paid into the Basic Account);  
and
- (c) 1.38% of the member's salary (paid into the Inflation Adjustment Account).

Prior to September 1, 2009, no contributions were made by the employer in respect of members whose accrued service exceeded 35 years. This limit was lifted effective September 1, 2009.

**Funding**

Section 12 of the College Pension Plan JTA provides that the Plan funding must comply with the *PBSA* requirements for a going-concern valuation. Further, future contribution rate changes indicated by a valuation must be shared equally between employers and members.

**Retirement Benefits: Eligibility Conditions for Pension**

Section 50 provides that an active member who terminates employment is entitled, upon application, to an unreduced pension calculated under section 54, if the member has:

- (a) attained age 55 and completed at least 35 years of contributory service; or
- (b) attained age 60 with at least 2 years of contributory service; or
- (c) attained age 65.

Section 51(a) provides for a reduced pension calculated under section 55(2) if the terminating member has attained age 55 and completed at least 2 years of contributory service.

Section 51(b) provides for a reduced pension calculated under section 55(4) if the terminating member has attained age 60 but has not completed 2 years of contributory service.

Under certain conditions, the contributory service requirements mentioned above can include service during certain periods of child rearing.

Section 78(4) provides that, before authorizing the payment of an immediate pension, the plan administrator may require a member and their employer to declare that no pre-arrangement to return to work with the same employer existed at the time of termination of employment.

**Calculation of Unreduced Pension**

Section 54 provides that the unreduced lifetime monthly pension payable to a member terminating employment on or after January 1, 2002 in the form of a single life annuity guaranteed for 10 years (the "normal form"), is calculated as the sum of the following:

- (a) 2% of the member's highest average salary multiplied by the number of years of pensionable service accrued before January 1, 1966,
- (b) 1.7% of the lesser of
  - (i) the member's highest average salary, and
  - (ii) 1/12 of the YMPE for the calendar year immediately before the effective date of the pension

multiplied by the number of years of pensionable service accrued on and after January 1, 1966<sup>1</sup>, and

- (c) 2% of the excess of the member's highest average salary over the amount determined under paragraph (b) (ii), multiplied by the number of years of pensionable service accrued on and after January 1, 1966<sup>1</sup>.

In addition, the member is entitled to a pension, payable until the earlier of the death of the member or the member reaching age 65, that is:

- (a) 0.3% of the lesser of
- (i) the member's highest average salary, and
  - (ii) 1/12 of the YMPE for the calendar year immediately before the effective date of the pension
- multiplied by
- (b) the number of years of pensionable service on and after January 1, 1966<sup>1</sup>.

(Prior to January 1, 2002, pensions were calculated under a 1.35%/0.65% lifetime/bridge formula. The improved benefit formula of 1.7%/0.3% applies to plan members who terminated employment on or after January 1, 2002.)

Highest average salary means one-twelfth of the average annual salary earned by a member during the 5 years of pensionable service (not necessarily consecutive) in which the salaries were highest (or, if the member has accrued less than 5 years of pensionable service, the total number of years and partial years of pensionable service).

The calculation of the pension payable to a deferred member who terminated employment on or after January 1, 2002 and who is entitled to an unreduced pension is also detailed in section 54. The pension is calculated on the basis of the single life guaranteed option with a term of 10 years using a benefit formula of 1.7%/0.3%.

Section 45 stipulates that the pension payable to a deferred member who terminated prior to January 1, 2002 will be based on the rules in force at the date of termination.

Accordingly, a member who terminated prior to January 1, 2002, but after January 1, 1999 will receive a pension on the basis of a single life guaranteed option with a term of 10 years, but using a benefit formula of 1.35%/0.65%.

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<sup>1</sup> Prior to September 1, 2009, service was limited to 35 years.

A member who terminated prior to January 1, 1999 will receive a pension in the form of a single life annuity (no guarantee), using a benefit formula of 1.3%/0.7%

A member who has made voluntary additional contributions in the past - these are no longer accepted - will be granted an additional pension or may take a refund.

### **Calculation of Reduced Pension**

Where a reduced pension is payable under section 51(a) to members aged between 55 and 60 who have 2 or more years of contributory service, section 55(2) provides that the lifetime and temporary pensions are each reduced by a percentage equal to 3% for each year of age by which the member is less than 60 years of age, prorated for fractions of a year.

Where a reduced pension is payable under section 51(b) to members aged 60 or over who do not have 2 years of contributory service, section 55(4) provides that the lifetime and temporary pensions are each reduced by a percentage equal to 5% for each year of age by which the member is below 65 years of age prorated for fractions of a year.

If employment terminates under age 50, or the member has less than 10 years of contributory service, or the member has less than 8 months of contributory service in the 24 months before termination of employment, the 3% (per year) early retirement reduction factor referred to above is increased to 5% (per year).

### **Alternative Types of Pensions**

Section 56 provides that a pension may be granted on the single life plan with a guaranteed period (5, 10 or 15 years), joint life and last survivor plan with a guaranteed period (5, 10 or 15 years), temporary life plan or a combination of these plans with the approval of the plan administrator. The amount of any pension granted on a form other than the normal form is calculated on an actuarially equivalent basis.

Where a member has a spouse at retirement, the member is required to elect a 60% joint life and last survivor plan, unless the spouse waives this requirement in writing or there is a written agreement or court order made under Part 5 or 6 of the *Family Relations Act* that is filed with the plan administrator. This option provides for a reduced amount payable to the member, continuing to the spouse on death of the member at 60% of the initial reduced amount. A spouse is as defined in the *PBSA*, and includes a common-law or same-sex spouse.

## **Disability Pensions**

Section 60 provides that a member is entitled upon application to a disability pension if the member, before reaching age 60, is totally and permanently disabled, has completed 2 years of contributory service and is not eligible for a monthly income benefit from a group disability plan. Despite the above provisions, a member who has received a lump sum payment instead of a monthly income benefit under a group disability plan is not eligible to receive a disability pension.

The disability pension is equal to the full unreduced lifetime portion of the pension (i.e. there is no additional bridge pension to age 65) earned to the date of disability.

Part 6 outlines the application process for a disability pension.

Sections 12(5) and 99(2) provide that if a member is receiving a monthly income benefit from an approved group disability plan, the member and employer do not make contributions and the member is not entitled to a pension under the Plan, but the period for which the member receives such group disability income benefit is considered pensionable service, with the final pension based on the highest average salary at disablement increased to retirement in accordance with changes in the consumer price index.

## **Pre-retirement Death Benefits**

The pre-retirement death benefits for active and inactive plan members are covered in section 69 as follows:

- (a) on death before age 60 with less than 2 years of contributory service, the death benefit is a payment of the member's contributions with interest;
- (b) on death before age 55 with 2 or more years of contributory service, the benefit is the full commuted value of the regular pension earned to the date of death (but not less than the value of member contributions with interest). If there is a surviving spouse, then the spouse may receive an immediate pension equivalent in value to the commuted value of the regular pension earned to the date of death;
- (c) on death after age 55 with 2 or more years of contributory service (or after age 60 with less than 2 years of contributory service), without a surviving spouse, the benefit is also equal to the full commuted value of the regular pension earned to the date of death (but not less than the value of member contributions with interest). If there is a surviving spouse, then the benefit is an immediate pension to the spouse that is actuarially equivalent to the full commuted value of the regular pension earned to the date of death.

If a member terminated employment under the previous vesting and locking-in rules, left contributions on deposit and dies before taking a benefit from the Plan, the service requirement in place at the time of termination (i.e. 10 years or 5 years) is used in place of 2 years of contributory service to determine benefit eligibility.

**Refunds, Vesting and Portability**

Sections 42(1)(a) and 44 provide for the payment of the member contributions plus interest should the member terminate membership under age 60 with less than 2 years of contributory service. In accordance with section 96, for periods on and after January 1, 1993, interest credits are based on the average yields of 5 year personal fixed term chartered bank deposit rates, published in the Bank of Canada Review as CANSIM Series V122515.

Under sections 42(1)(b) and 45, a terminating member is entitled to a deferred pension equal to the full normal pension accrued to the date of termination; this may be paid on a reduced basis at an early retirement age depending on the service to termination - see above "Eligibility conditions for pension" section). Sections 42(1)(c) and 46 provide for the payment of a lump-sum commuted value in lieu of the deferred pension, if the member is below age 55, subject to the commuted value being payable on a locked-in basis. Under certain limited conditions (small pensions, or small commuted values) the *PBSA* permits the election of a lump-sum payout, regardless of age, and on a non-locked-in basis.

Section 100 provides that the deferred vested pension of a terminating member is based on the highest average salary at termination, increased to retirement by the percentage increase granted to pensions for the period between the month of termination and the month the pension becomes effective<sup>1</sup>.

Section 75(3)(h) provides that the cost of the indexing described above is funded from the Inflation Adjustment Account.

**Cost of Living Benefits (Indexing)**

Section 73 sets out how cost of living benefits are to be administered. It provides for increases to retired members on January 1 of each year, with the benefits funded from the Inflation Adjustment Account. The benefit is based on the total amount of pension being received, including previous cost of living increases, less any portion of the pension that is a result of voluntary contributions (which are no longer permitted) and/or any temporary life annuity arising as a result of converting some or all of the regular pension to one of the optional forms, if the temporary annuity commenced before January 1, 2006. (The bridge pension to age 65, payable as part of the regular pension formula, is subject to indexing increases.)

Indexing granted on and after January 1, 2011 is calculated as the lesser of:

- (a) the percentage change in the average CPI for the 12 months ending October 31 over the highest average CPI for any previous 12 month period ending October 31, and

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<sup>1</sup> For increases prior to December 31, 1980, the increase in the highest average salary is in accordance with changes in the pension index.

- (b) the sustainable indexing rate, which is to be recommended by the actuary during the triennial valuation and is subject to the approval of the board,

provided there are sufficient funds in the IAA to meet the cost of the increase.

Pensions will not be reduced in years of deflation. In years immediately following a period of deflation, pensions will only be increased as described above once there is net positive inflation over the period since the pensions were last increased.

Section 73 sets out additional requirements with regards to the cost of living benefit, including:

- (a) the same uniform percentage increase will be granted in respect of all pensions eligible for adjustment;
- (b) the increase is prorated if the pension has not been in payment for at least 12 months;
- (c) the total capitalized value of all cost of living benefits granted on January 1 must not exceed the amount in the Inflation Adjustment Account on the preceding September 30; and
- (d) the capitalized value of all cost of living benefits granted annually is transferred from the Inflation Adjustment account to the Basic Account.

## **The Fund**

Section 75 provides that the Pension Fund is divided into the following four accounts:

- (a) the **Basic Account**, consisting of all the assets in the fund other than assets in the Inflation Adjustment Account, the Supplemental Benefits Account and the Retirement Annuity Account;
- (b) the **Inflation Adjustment Account**, consisting of:
  - (i) the 1.38% contribution by each of the members under section 5(1)(c);
  - (ii) the matching employer contributions under section 6(1)(c);
  - (iii) the net investment income earned on the Inflation Adjustment Account; and
  - (iv) the income, as determined by the plan administrative agent, that is earned on other fund assets held in the Basic Account in respect of pensions being paid and that is in excess of the investment return anticipated in the most recent actuarial valuation;

less:

- (v) amounts transferred to the Basic Account in respect of capitalized cost of living benefits granted under section 73 and 88;

- (vi) refunds to plan members in respect of the 1.38% contribution made to this account under section 5(1)(c), or amounts otherwise transferred out of this account in respect of member and employer contributions allocated to this account;
- (vii) amounts determined by the plan administrative agent in respect of the portions of commuted value payments or other transfers out of the Plan that are attributable to cost of living adjustments;
- (viii) amounts transferred to the Basic Account that are equal to the capitalized value of increases in deferred pensions resulting from increases in highest average salaries under section 100; and
- (ix) amounts transferred to the Supplemental Benefits Account as specified by the board;

(Section 12(3) of the JTA also permits the Board to transfer portions of any actuarial surplus in the Basic Account to the IAA.)

- (c) the **Supplemental Benefits Account**, consisting of assets required for the administration and payment of benefits that are non-registrable under the *Income Tax Act*; and
- (d) the **Retirement Annuity Account**, consisting of voluntary contributions made under the previous statutes, and interest earnings thereon.

### **Income Tax Act Limits**

The *Income Tax Act* imposes certain limits on the contributions that may be made to, and the benefits that may be paid from, a registered pension plan. However, in total, the contribution requirements from, and the benefit promises to, Plan members have not been altered under the College Pension Plan. To this end, a Supplemental Benefits Account has been created to cover the financing and payment of benefits in excess of those registrable under the *Income Tax Act*.

The excess benefits are paid on a current cash basis, by allocating from the regular employer contributions, the amounts necessary to maintain the Supplemental Benefits Account at a zero balance. Effectively, from a Plan member's perspective, it is expected that these procedures will be invisible - the total contribution and benefit obligations remain unchanged. We have ignored the implications of all such internal restructuring in completing the primary, Basic Account valuation. In the Plan summary herein, and elsewhere in this valuation report, our references to contributions/benefits to/from the Basic/Inflation Adjustment Accounts are inclusive of the allocations to/from the Supplemental Benefits Account; in general, the allocations to/from the Supplemental Benefits Account have not been referenced.

We have also completed supplementary funding valuations recognizing the income tax limits on pensions. We understand that these limits are applied only in respect of service after 1991. The maximum annual pension permitted (before application of any early retirement reductions, where applicable) is the lesser of:

- (i) \$2,647 (for 2012) multiplied by the years of service; and
- (ii) 2% multiplied by the years of service further multiplied by the average of the best 3 years of remuneration paid to the member.

Under the income tax rules, the flat \$2,647 limit will be automatically indexed each year.

### **Other Items**

1. The College Pension Plan Post Retirement Group Benefit Rules, made under article 13 of the JTA, set out the non-pension (i.e., group) benefits that are provided for retired members. These post-retirement group benefit rules replaced the College Pension Plan Post Retirement Group Benefit Regulation, B.C. Reg. 490/2003, effective June 22, 2012.

Effective September 1, 2009, the member is responsible for paying 100 per cent of the premium for extended health and dental benefits. Previously, the cost of those benefits was carved out from employer contributions to the IAA. This carve out was limited to a maximum of 1% of pensionable salary (out of the total employer IAA contribution at that time of 1.09%).

Effective April 1, 2004, the member is responsible for paying 100 per cent of the premiums for coverage under the Medical Services Plan ("MSP").

2. Section 9 of the JTA provides that all expenses incurred in the administration of the Plan are to be paid from the fund.
3. A maximum of 5 years taken to raise a child may be recognized in establishing eligibility for a pension provided the member has a record of pensionable service immediately before and after the child-rearing period(s). [Section 13]
4. Section 57 enables an employer to request the plan administrative agent to adopt a Special Retirement Incentive Plan (SRIP), whereby the age and service conditions, or the early retirement percentage reductions, or both, may be adjusted. Where the plan administrative agent agrees, the administrative agent must also determine the members eligible for the SRIP, the period it remains open, the conditions applicable to the incentives, the additional costs to the employer, and the timing of these payments to fund the SRIP.
5. In 1999, the definitions of, and references to, approved and reciprocal employers were removed from the Plan by Bill 18 (1997), to comply with *Income Tax Act* requirements. In general, these provisions

allowed for portability among various plans (mostly the four public sector plans in B. C.), whereby service and salaries were commonly recognized in all of the plans. The arrangements for the four public sector plans in B. C. were replaced by a transfer of reserve agreement, whereby the plan member could elect to have a reserve transferred and then be covered for full service by the rules of the importing plan. The College Pension Plan withdrew from the Interplan Pension Transfer Agreement effective October 31, 2002 and negotiated three separate "bilateral" agreements with the Municipal, Public Service and Teachers' Pension Plans. On April 1, 2004, these "bilateral" service transfer agreements with the Municipal, Public Service and Teachers' Pension Plans were replaced with the Public Sector Transfer Agreement.

Effective April 1, 2010, reciprocal transfers between the College, Municipal, Public Service and Teachers' Pension Plans are made exclusively under the National Public Service Pension Transfer Agreement (NTA). Under the NTA, as with the Public Sector Transfer Agreement (and the previous bilateral agreements), if the importing plan's benefits are more generous, the transferred service is prorated based on each plan's benefits. Members may pay for any shortfall, subject to CRA approval, within deadlines set by the plans. Members can also choose to leave their entitlements with their respective plans and apply for the appropriate benefits available from each plan at termination and/or retirement.

## Appendix B: Actuarial Methods and Assumptions

The significant actuarial assumptions are summarized below.

	Funding Valuation	Sustainable Indexing Valuation
<b>Investment Return</b>	6.5% p.a. <sup>1</sup>	6.75% <sup>1</sup>
<b>General Salary Increases</b>	3.75% p.a. <sup>1</sup>	3.50% <sup>1</sup>
<b>Seniority Salary Increases</b>	Annual percentages varying by age and sex	Same
<b>CPI Increases</b>	3.00% <sup>1</sup>	2.75% <sup>1</sup>
<b>Pension Indexing</b>	<ul style="list-style-type: none"> <li>▪ Future indexing of pensions and deferred pensions ignored, as will be covered by Inflation Adjustment Account</li> <li>▪ Future indexing (by inflation) of wage base for disability accruals assumed to be a charge to the Basic Account and to be 3.0% per annum (unchanged from the previous valuation)</li> <li>▪ Indexing to date is capitalized and forms part of pension liability</li> </ul>	<ul style="list-style-type: none"> <li>▪ Future indexing of pensions and deferred pensions at “Sustainable Indexing Rate” – This rate is calculated and is the primary output of this valuation</li> <li>▪ Future indexing (by inflation) of wage base for disability accruals assumed to be a charge to the Basic Account and to be 2.75% (unchanged from the previous valuation )per annum</li> <li>▪ Indexing to date is capitalized and forms part of pension liability</li> </ul>
<b>Asset Values</b>	<ul style="list-style-type: none"> <li>▪ Assets carried at smoothed market values</li> <li>▪ Smoothed value limited to 110% of Market Value</li> </ul>	<ul style="list-style-type: none"> <li>▪ Assets carried at smoothed market values</li> <li>▪ Smoothed value limited to 105% of Market Value</li> </ul>
<b>Costing Method</b>	<ul style="list-style-type: none"> <li>▪ Contributions are based on an entry-age funding approach</li> </ul>	<ul style="list-style-type: none"> <li>▪ Required contributions are based on an entry-age funding approach</li> <li>▪ Contributions are set equal to the funding valuation basic normal cost plus IAA contributions.</li> </ul>

More detail with respect to the above, detail with respect to other assumptions, and comparisons with assumptions and approaches in the previous valuation follow.

<sup>1</sup> Unchanged from the previous valuation.

## 1. Actuarial Methods

The plan has been valued on a going-concern basis, which assumes that the plan will continue to operate indefinitely. The basis is used to estimate the funded position of the Plan, and to estimate the contributions required to be made to the Plan's fund.

The methodology used to calculate the valuation liabilities shown in the statement of actuarial position was as follows:

The liability for current pensioners and active members was calculated by projecting the benefit payments to be made to those persons and to their eligible spouses using the actuarial assumptions described below and then discounting those projected payments to the valuation date at the investment return assumption.

The liability for members currently receiving benefits from a long-term disability plan was calculated as if they would continue to earn service credits and ultimately receive a pension from the Plan.

The liability for the inactive group was calculated on the assumption that a proportion (based on present working status, contribution balance, length of credited service and date of last contribution) would again become contributing members of the Plan and a further proportion (based on similar, but different, criteria) would collect deferred vested pensions. The liability for the remaining inactive members was calculated as twice their accumulated refund values.

In order to test the adequacy of the current contribution rates, we calculated the required member/employer contribution rate for current service in accordance with the entry-age actuarial cost method, based on the data for those members who had less than five years of contributory service on the valuation date and the actuarial assumptions described below. This method produces the level rate of the member/employer contributions sufficient to provide the benefits for the average future new entrants to the plan. The cost so determined is also referred to as the normal actuarial cost and is calculated on an aggregate basis for all entrants as a level percentage of payroll.

The valuation assets consist of:

- (i) The Basic Account; and
- (ii) The present value of future member and employer contributions at the entry-age normal cost rates, for the closed active group, for the basic non-indexed benefits.
- (iii) The present value of any existing amortization requirements established at previous valuations.

The unfunded actuarial liability is equal to the excess of the valuation liabilities over the valuation assets. If the assets exceed the liabilities, then the difference between them gives rise to an actuarial surplus. Additional payments, in excess of these normal actuarial costs, required to amortize this unfunded liability/surplus were then determined, as a percentage of payroll, as follows:

- (1) If the result is an unfunded liability amortize it over the 15 year period commencing September 1, 2012<sup>1</sup>; and
- (2) If the result is a surplus (the result of a gain since the last valuation), apply the gain to amortize or reduce the previously identified unfunded liabilities, starting with the oldest established. If, after removing all previously established amortization amounts there is still a surplus, amortize this surplus over 25 years.

The required contributions are the sum of the normal actuarial cost and the amounts required to amortize the unfunded actuarial liability/surplus.

The actuarial procedures followed are substantially the same as those in the previous valuation.

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<sup>1</sup> We use an unadjusted 15 year rolling amortization period for the supplementary indexed valuation.

## 2. Treatment of Member and Pensioner Data

Data as of August 31, 2012 were prepared by the Pension Corporation for 12,707 active members, 5,195 pensioners, 234 members receiving benefits from a long-term disability plan, 4,780 inactive members plus a further 2 non-retired individuals with very limited data, 3,560 active member terminations and 204 pensioner terminations during the period September 1, 2009 to August 31, 2012. The Pension Corporation advised us that the data supplied are generally proper, complete and in accordance with specifications, unless otherwise noted.

Where possible, we compared totals with corresponding details in the Plan's audited Annual Reports. We also subjected the data to a number of tests of reasonableness and consistency, including the following:

- A member's (and partner's as applicable) age is within a reasonable range;
- A member's gender or date of birth did not change;
- A member joined the plan or commenced pension at a reasonable age;
- Accrued service increased by a reasonable amount (e.g. no more than 36 months since the last valuation and no more than 12 months in the valuation year);
- The salary level and the salary increase from the previous valuation was within a reasonable range;
- Pensions in pay increased by a reasonable amount (e.g. in line with the indexation since the last valuation); and
- We examined the additions to and deletions from each of the data files (i.e., the files for active employees, pensioners and terminated members) since the previous valuation to determine whether all Plan members were accounted for in this valuation, to check for duplicate records and to confirm pension amounts.

There were a number of discrepancies recorded during our examination of the data and we sought clarification of these from the Pension Corporation. Where necessary, we modified the data, our assumptions, or both, to compensate for these discrepancies.

The active member data includes a number of individuals who work less than full time. For the purposes of calculating liabilities and normal actuarial costs, we treated all members as if they were full-time employees after the valuation date; however, in calculating the amortization costs as a percentage of total future payrolls, we reduced the total payroll base by 10% to reflect the part-time employment (an 8% adjustment was applied at the previous valuation).

The active member data included 2,034 persons who had no salary or service reported for the year ending August 31, 2012, or with a last-contribution-date prior to August 2012. We excluded them from the active member base, and have included them with the inactive data, holding a liability for 356 of them (those with at least 3 years of service and a basic employee contributions with interest balance of at least \$1,500) as if they would be reactivated on August 31, 2012 (we set their salaries equal to the average salaries for active members in the same age-sex category). We held a liability equal to twice the basic employee contributions with interest balance for the remaining 1,678 persons. We excluded a further 2 active members from the valuation because of missing, invalid or inconsistent detail. Liabilities of twice their basic employee contributions with interest balance were held for these members. A similar approach was used in the previous valuation.

Salary details were inappropriate (missing, very low, or very high) for 21 active members. We assumed that these 21 members had the same average earnings as for other actives in the same age-sex category.

The liability for 225 of the members on long-term disability was calculated as if these individuals would ultimately collect deferred vested pensions starting at age 63, with deferred pensions on the basis of service projected to retirement date and the actual salaries indexed to the valuation date (where the actual salary detail shown for those members was inappropriate, we used the average salaries for active members in the same age-sex category). We excluded 9 long-term disability members from the valuation because of missing, invalid or inconsistent detail. Liabilities of twice their basic employee contributions with interest balance were held for these members. A similar approach was used in the previous valuation.

We divided the 4,780 inactive members into two classes:

- (i) Those with missing, invalid or inconsistent detail, or whose basic employee contributions with interest balance was less than \$1,500, or who were known to have taken a refund after the valuation date, and
- (ii) All other inactive members.

We calculated liabilities for the second group on the assumption that 100% of this group would receive vested pensions. The liability for the first group was held as twice their basic employee contributions with interest balance. These are unchanged from the previous valuation.

With respect to the 2 remaining non-retired members with limited data, we held a liability equal to twice their basic employee contributions with interest balance.

Of the total pensioner data, there were 5 members excluded from the valuation because they died prior to the valuation date with no outstanding guaranteed pensions due, and hence their liability is zero.

The data from the Pension Corporation and our treatment of this data is summarised below. Further details on the active member data, the new entrant groups on which our entry-age costs are based, the inactive member data and the pensioner data are summarized in Appendices C, D and E.

	Pension Corp. Data	Valuation Treatment					
		Pensioners	Active Members	Long Term Disability	Vested	Reactivate	Refund 2 x CWI <sup>1</sup>
Pensioners	5,195	5,190 <sup>2</sup>					
Active Members	12,707		10,671			356	1,680
Long Term Disability	234			225			9
Terminated Vested	4,780				2,399		2,381
Limited data	2						2
<b>Total membership</b>	<b>22,918</b>	<b>5,190</b>	<b>10,671</b>	<b>225</b>	<b>2,399</b>	<b>356</b>	<b>4,072</b>

### 3. Actuarial Assumptions

#### Investment return and general salary increase rates

Our actuarial costing method involves projecting future benefit disbursements and contribution and investment income. In such projections, the most significant assumptions are those that are made for the future rates of return to be earned by the fund and future general salary increases (which are across-the-board increases applying to employees regardless of service, rank or position).

#### (a) Funding Valuation - excess investment return threshold

The Funding Valuation investment return assumption is also significant for another reason. Since 1980, income earned on basic account assets held in respect of pensions in pay in excess of the investment return anticipated in the most recent actuarial valuation is transferred to the Inflation Adjustment Account. A decrease in the investment return assumption without a corresponding change in the other related valuation economic assumptions (such as general salary increases and post-retirement indexing) would have at least two effects:

<sup>1</sup> Contributions with interest.

<sup>2</sup> Excludes 5 pensioners with zero liability.

- (i) it would increase the amount of excess investment return allocated to the IAA, and hence increase the potential for future indexing; and
- (ii) it would increase the costs of the basic non-indexed plan, provided benefit levels are not changed.

An increase in the investment return assumption would have the opposite effects. In this context, the excess investment return threshold takes on benefit design connotations as well, and thus consistency in the assumptions, from one valuation to the next, takes on added significance.

The previous valuation used a long-term investment return assumption of 6.5% per annum. As noted earlier, this also became the threshold rate used to determine excess investment return transfers to the IAA during the post-retirement period; effectively, this is the same as saying that the Basic Account will only earn a rate of 6.5% per annum during the post-retirement period.

#### **(b) Actual returns and asset mix**

We have calculated market value returns on the total fund (i.e. Basic plus IAA), including non-invested assets (i.e. receivables, net of payables), net of investment-related expenses, and assuming that all cash flows occur at mid year, as 6.4% for 2010, 8.2% for 2011 and 7.3% for 2012. At August 31, 2012, approximately 57% of the total portfolio was invested in equities (including private placements), a further 16% in real estate, and the balance of 27% in fixed income (including mortgages).

#### **(c) Expected returns**

After examining the net average investment return earned by the fund's investments, the yield on investments made in recent years, the likely future trend of investment returns in general, the investment practices, and the provisions of this Plan - e.g. the allocation of excess investment income to the Inflation Adjustment Account - we have concluded that a reasonable best estimate of the long term investment return on the plan's assets is 6.75%. We also concluded that a reasonable best estimate of the real return on the assets, i.e., the investment return in excess of inflation, is 4%.

In setting the Funding Valuation assumptions, it is necessary to reduce these expected returns by a margin, so that the resulting liabilities have a suitable provision for adverse deviations. Following discussions with the Board regarding the appropriate adjustments to the best estimate assumptions and taking into account the requirements of the Board's funding policy, for the purposes of this valuation we decreased our long-term investment return assumption to 6.5% per annum. We also continued with our previous valuation assumption for the real return of 3.5%. In other words, there is a margin of 0.25% on the investment return assumption, and a margin of 0.5% on the real return assumption.

The following table shows the development of the investment return assumption:

	<b>Discount rate</b>
Weighted average return	6.68%
Diversification and rebalancing effect	0.30%
Provision for investment related expenses	(0.20%)
Rounding	(0.03%)
<b>Estimated net investment return before margin</b>	<b>6.75%</b>
Margin for adverse deviation	(0.25%)
<b>Discount return assumption (rounded to nearest 0.25%)</b>	<b>6.50%</b>

To determine the going concern discount rate, our model determined expected long term capital market returns, standard deviations and correlations for each major asset class by using historic returns, current yields and forecasts. We then stochastically generated projected asset class returns for 1,000 paths over 20 years to create expected returns for each major asset class and applied these to the Plan's target asset mix.

For the purposes of establishing the discount rate used in this report, we have assumed that there will be no added-value returns from employing an active management strategy in excess of the associated additional investment management fees. The investment expense allowance of 0.20% provides for expected future management fees.

As the sustainable indexing target is not guaranteed, and the primary objective of the sustainable indexing approach is to improve intergenerational equity, it is not appropriate to include margins in the sustainable indexing basis. The Sustainable Indexing Valuation therefore assumed a nominal investment return of 6.75% and real investment return of 4%.

**(d) Real return and salary relationships - derive salary assumption**

The 6.5% investment return assumption used in this valuation was viewed as consisting of a real return component of about 3.5% per annum plus a long-term underlying inflation assumption of about 3.0% per annum. This can also be viewed as a best estimate of future inflation of 2.75% (derived from the best estimate nominal return assumption of 6.75% less the best estimate real return assumption of 4%), plus a margin for adverse deviations of 0.25%.

The general salary increase assumption used in the 2009 valuation was 3.75% per annum. This was viewed as consisting of the underlying inflation assumption of 3.0% per annum, plus a real salary increase component of 0.75% per annum. For this valuation, we continued with the real salary increase assumption of 0.75% and the general salary increase assumption of 3.75%. The real salary increase assumption of

0.75% consists of a best estimate of real salary increases of 0.50%, plus a margin for adverse deviations of 0.25%.

For the Sustainable Indexing Valuation, the general salary increase assumption is 3.5% per annum. This is made up of the best estimate inflation assumption of 2.75% plus real salary increase of 0.75%.

The impact of these assumptions on the Funding Valuation result is discussed further below.

**(e) Impact of investment return and salary assumptions on the valuation**

During the **post-retirement period**, the excess investment return threshold is critical as this is the discount rate for the Basic Account post-retirement liabilities. It also sets the excess investment return threshold which puts a ceiling on the amounts the Basic Account can effectively earn on the portion of the assets that support post-retirement liabilities. For example, if the threshold is 6.5%, then, provided the long-term returns exceed 6.5% on average, all of the excess will be transferred to the IAA, i.e. the Basic Account will only retain 6.5% on these assets.

During the **pre-retirement period**, it is the relationship, i.e. the net difference, between the investment return and general salary increase assumptions that is the key, rather than their absolute levels - projected benefits increase each year by the salary assumption and are then discounted by the investment assumption, i.e. the net result is that the liabilities are effectively being discounted by the net difference between the two assumptions. For example, the long-term assumptions we have used in this valuation (i.e. 6.5% investment return, 3.75% salary, 3.0% underlying inflation) would produce results similar to those using assumptions of 6.75% investment return and 4.0% salary, with 3.25% underlying inflation; or 7.0% investment return and 4.25% salary, with 3.5% underlying inflation, etc. Thus, the underlying inflation assumption itself is not material to the result.

**(f) Summary of interrelationships**

The 2009 and 2012 annual investment return and general salary increase assumptions, and their underlying economic interrelationships, are summarized below.

	Funding Valuation	Sustainable Indexing Valuation
	2009 and 2012	2009 and 2012
1. Investment return = excess investment return threshold	6.50%	6.75%
2. Real return rate	3.50%	4.00%
3. Implied underlying inflation = 1 - 2	3.00%	2.75%
4. Real salary increase	0.75%	0.75%
5. General salary increase = 3 + 4	3.75%	3.50%

**(g) Actual vs. expected salaries; adjust data salaries**

The 2012 valuation data indicates that average annual earnings increased by about 2.8% from mid-2009 to mid-2012 (i.e. about 0.94% per annum), as compared with an expected increase of about 11.7% (i.e. about 3.75% per annum) on the basis of the assumptions used in the 2009 valuation.

The input data salaries provided to us for this valuation were the actual earnings during fiscal 2012. We took them without further adjustment as being equal to the salary rates on the valuation date (this may slightly understate the actual salary rates at the valuation date). Thereafter, the assumed rates of salary increase are applied continuously during each future year.

**(h) YMPE increase**

We assumed that the YMPE under the Canada Pension Plan would increase at the general salary increase rate (Funding Valuation = 3.75% per year, Sustainable Indexing Valuation = 3.5%) from its 2013 level of \$51,100. In the previous valuation we assumed that the YMPE would increase at the same rate of 3.75% per year for Funding Valuation and 3.5% per year for Sustainable Indexing Valuation, but from its 2010 level of \$47,200.

**Pension indexing****(a) Basic Funding Valuation**

Indexing supplements on and after January 1, 1982 are provided on an annual basis and are limited to those amounts that can be appropriately financed by the balances available in the Inflation Adjustment Account. Thus we do not need to allow for future indexing in our calculations as the costs of this indexing are currently fixed at 1.38% of salaries to be paid by each of the members and the employers. With respect to indexed supplements granted through August 31, 2012, the present values have been included in the actuarial liabilities for pensions in the course of payment and thus form part of the determination of the recommended contribution.

As in the previous valuation, we ignored the future pre-retirement escalation that applies to vested pensions, since the cost of this "indexing" is also charged to the Inflation Adjustment Account.

With regard to the vested pensions of members who have terminated employment, the amounts of deferred pensions quoted to us include indexing during the deferred period to date. We understand that such transfers from the Inflation Adjustment Account do not occur until retirement (theoretically, such transfers should be made on an annual basis as the indexing occurs, so as to reduce the inter-generational transfer of the costs of such indexing). We have therefore adjusted the deferred pension amounts to remove this indexing so that

the Basic Account liability is aligned with the allocation of assets between the Basic and IAA accounts. In previous valuations, we made no such adjustment.

The indexing of salaries before retirement in the case of members on long-term disability is, on the other hand, a charge to the Basic Account rather than to the Inflation Adjustment Account. Accordingly, in valuing the deferred pensions for those currently on long-term disability, we have made an allowance for this by applying an escalation assumption (at the full underlying inflation assumption) of 3.0% per annum during the deferral period to retirement.

***(b) Sustainable Indexing Valuation***

All current and future pensions are assumed to increase at the sustainable indexing level.

For those on long term disability, we allow for escalation in the deferral period at a rate of 2.75% per annum, which equals the best estimate assumption for inflation. In other words, for the sustainable indexing valuation, the escalation assumption does not include the 0.25% margin taken into account in the funding valuation.

**Asset values**

The fund's annual reports record assets on a market value basis. We relied on these annual reports for the asset values used for the years ending August 31, 2010 to August 31, 2012.

As in the previous valuation we applied a five year smoothing technique to these assets. We believe a smoothing approach is appropriate as it cushions the actuarial valuation results against dramatic swings in market value.

To obtain the unconstrained smoothed value, we first determine the actual market value return during the year (taking into account the timing of non-investment related cashflows, i.e. the net contributions minus benefits and non-investment expenses). We then determine an assumed return for the year equal to the assumed underlying real return rate plus the year-over-year change in the consumer price index. The difference between these two returns is then spread over a five year period, recognizing one-fifth of it in each of the current and four succeeding years. This approach effectively spreads the difference between (a) the total investment return (including both realized and unrealized capital changes) and (b) a hypothetical return based on a long-term real return rate, over a five year period.

**(a) Funding Valuation Assets**

As introduced for the previous valuation, we included an additional constraint on the smoothed value of assets, whereby the smoothed value is restricted to a range of 90% to 110% of market value. This means that in periods of significant market decline the smoothed value does not become too large relative to the market value - effectively the constraint accelerates recognition of very poor market returns and allows the contribution rate to more appropriately reflect the actual returns earned by the plan. This constraint did not apply as at August 31, 2012.

The application of this approach to the total fund yields the following results:

**Total Fund Smoothing**

<b>Target return</b>	<b>2010</b>	<b>2011</b>	<b>2012</b>
1. Aug-over-Aug increase in CPI	1.7%	3.1%	1.2%
2. Base return = (1) + 3.5%	5.2%	6.6%	4.7%
<b>Year-end asset values - \$000's</b>			
3. Market value	2,485,243	2,711,854	2,922,998
4. Smoothed value	2,602,784	2,764,332	2,867,567
5. Ratio of (4) ÷ (3)	1.047	1.019	0.981
<b>Annual returns</b>			
6. Market value	6.4%	8.2%	7.3%
7. Smoothed value	4.1%	5.3%	3.3%

Using the relationship between the market and adjusted values shown in line 5 above, and applying this relationship to the Basic Account and Inflation Adjustment Account balances, we get:

**Year-end asset values - \$000's**

<b>Basic Account</b>	<b>2010</b>	<b>2011</b>	<b>2012</b>
8. Market value	2,198,470	2,402,772	2,598,671
9. Smoothed value	2,302,448	2,449,269	2,549,390
10. Ratio of (9) ÷ (8)	1.047	1.019	0.981
<b>Inflation Adjustment Account</b>			
11. Market value	286,773	309,082	324,327
12. Smoothed value	300,336	315,063	318,177
13. Ratio of (12) ÷ (11)	1.047	1.019	0.981

**(b) Sustainable Indexing Valuation Assets**

As mentioned previously, a primary reason for using a sustainable indexing approach is to improve intergenerational equity. Intergenerational equity would be best served by using best estimate assumptions (as we are doing) and not smoothing the assets. However, an important secondary objective is to attempt to stabilise the indexing target over time. This secondary objective is aided by smoothing the assets. In discussion with the Board, it was concluded that using a best estimate basis together with a low smoothing limit would provide a suitable balance between these two objectives. Accordingly, in our assessment we have used the five year smoothed value of assets, limited to no more than 105% of the market value of assets. As the smoothed value of assets as at August 31, 2012 is below 105% of the market value, no

limitation was required for the sustainable indexing assets. This compares to August 31, 2009 where the smoothed assets for the sustainable indexing purposes were capped at 105% of market value.

**Mortality**

Because of limited mortality experience, and given the similarity of the plans, we used the same basis as for the B.C. Teachers' Pension Plan valuation as at December 31, 2011, namely:

- (a) For active members we assumed 55% for males and 70% for females of the respective rates in the 1994 Group Annuity Mortality Table. The previous valuation used 60% for males and 75% for females of the respective rates in the 1994 Group Annuity Mortality Table.
- (b) For members retired on account of disability we used 75% for males and 80% for females of the mortality rates (applicable in 1997) for similar retirees used for the valuation of the Canadian Public Service Superannuation Plan as at March 31, 1996 (that valuation applies mortality improvement factors, on a dynamic basis, to certain base rates). The previous valuation used corresponding multiples of 80% for males and 85% for females of the respective rates for similar retirees used for the valuation of the Canadian Public Service Superannuation Plan as at March 31, 1996.
- (c) For other retired members, the beneficiaries and spouses of former members, and for active members after retirement, we used 55% for males and 70% for females of the rates of the 1994 Group Annuity Mortality Table. In the previous valuation, we used 60% for males and 75% for females of the rates of the 1994 Group Annuity Mortality Table.

**Withdrawal**

We examined the rates of withdrawal for reasons other than death, retirement or disability over the period September 1, 2009 to August 31, 2012 and compared this with the experience observed and the rates used for previous valuations. The observed rates for all members were higher than assumed in previous valuations. As a result, we made changes to the withdrawal rates used for the previous valuation, by adopting the following multiples of those rates.

***Multiples applied to 2009 Rates***

	In the first 3 years of service			After 3 years of service
	1 <sup>st</sup> year	2 <sup>nd</sup> year	3 <sup>rd</sup> year	
Males	120%	120%	120%	120%
Females	120%	120%	120%	120%

Sample withdrawal rates are shown in the following tables.

**A. Withdrawal Rates Applicable in the First 3 Years of Service**

*(These include terminations from all sources, i.e., death, disability and retirement)*

Age at entry	2012 valuation			2009 valuation		
	1 <sup>st</sup> year	2 <sup>nd</sup> year	3 <sup>rd</sup> year	1 <sup>st</sup> year	2 <sup>nd</sup> year	3 <sup>rd</sup> year
<b>Males</b>						
20	.174	.131	.094	.145	.109	.078
30	.174	.131	.094	.145	.109	.078
40	.174	.131	.094	.145	.109	.078
50	.174	.131	.094	.145	.109	.078
<b>Females</b>						
20	.074	.092	.077	.062	.077	.064
30	.191	.192	.119	.159	.160	.099
40	.169	.116	.088	.141	.097	.073
50	.169	.116	.088	.141	.097	.073

**B. Withdrawal Rates Applicable After 3 Years of Service**

Attained age	Males		Females	
	2012 valuation	2009 valuation	2012 valuation	2009 valuation
23	.073	.061	.106	.088
33	.043	.036	.073	.061
43	.030	.025	.031	.026
53	.030	.025	.028	.023

The withdrawal rates we have used do not extend past age 54; they were previously set at a level less than 100% of experience rates to be on a basis consistent with our handling of the inactive member data, where we assume some will be reactivated.

**Disability**

The Plan provides for either the payment of a disability pension from the Plan or, for members receiving long-term disability benefits, the continued accrual of pension benefits. We examined the combined experience of members going on disability pensions and on long-term disability and, as a result, modified the rates used in the previous valuation. Since most members receive continuing disability service credits rather than an immediate pension, we have continued to value the disability cost for active members as a deferred pension (indexed before retirement) with continued accrual of service, rather than as an immediate pension. Based on an examination of those now retired who had, prior to retirement, been in receipt of disability service credits, we assumed that the deferred pensions would commence at age 63 (or, immediately, for those older than age 63). The same assumption was made in the 2009 valuation.

Sample disability rates are shown in the following table. No direct allowance is made for the possibility of an individual recovering from disability prior to retirement - the rates used have been reduced from the observed disability incidence to implicitly allow for such recoveries.

**Sample disability rates**

Age	2012 valuation		2009 valuation	
	Males	Females	Males	Females
25	.0002	.0001	.0002	.0001
35	.0003	.0007	.0003	.0007
45	.0016	.0023	.0017	.0024
55	.0044	.0064	.0046	.0067

The rates used for this valuation are 100% for males and 100% for females of the respective rates used for the valuation of the Canadian Public Service Superannuation Plan as at March 31, 2005. The 2009 valuation used multiples of 105% for males and 105% for females applied to the respective rates used for the valuation of the Canadian Pubic Service Superannuation Plan as at March 31, 2005.

**Retirement**

We examined the 2009-2012 retirement experience and compared this with the experience observed in our previous analyses of the retirement rates and with the rates used in the previous valuation. In general, the actual experience show fewer retirements than were indicated on the basis of the rates used in the previous valuation. We gave partial recognition to the observed experience by adopting modest reductions to some of the rates assumed in the previous valuation for retirement.

The rates used in this and the previous valuation, are as follows:

**Retirement rates**

Age	Service	2012 valuation		2009 valuation	
		Males	Females	Males	Females
<b>For unreduced retirement pensions</b>					
55-59	35	.25	.25	.30	.30
60	10	.33	.32	.33	.32
61	10	.18	.22	.20	.24
62	10	.20	.22	.20	.24
63	10	.22	.26	.22	.26
64	10	.24	.30	.24	.30
65	0	1.00	1.00	1.00	1.00
<b>For reduced early retirement</b>					
55-59	at least 10 years, but age plus service add to less than 80	.04	.05	.06	.06
55-59	age plus service add to at least 80	.11	.14	.12	.14

It should also be noted that even though pensions (unreduced and reduced) are available with less than 10 years of service, we have continued to apply the retirement rates before age 65 only to those with 10 or more years of service, on the presumption that those with fewer than 10 years would not retire until age 65.

**Seniority salary scales**

Seniority salary increases are in addition to the general salary increases and are intended to reflect increasing seniority, recognition of merit and promotion. We examined the seniority salary scales based both on the earnings history of the active members during the 3 year period ended August 31, 2012 and on the graduated average salaries of the active members as of August 31, 2012, and compared these with the experience observed and rates used in the previous valuation. Based on these investigations we decided to continue with the previous salary scales. Sample earnings rates expressed as a proportion of earnings at age 65 are as follows:

**Sample seniority earnings rates**

Age	2012 and 2009 valuations	
	Males	Females
25	.606	.645
35	.830	.824
45	.954	.926
55	.998	.979
65	1.000	1.000

**Proportion of eligible terminating members electing a vested pension**

Locking-in of vested pensions occurs after 2 years of service, in respect of all service credits. We have therefore valued all terminations with 2 or more years of service as vested pensions. The same assumption was made in the previous valuation.

The balance of the terminating members (i.e., those with less than 2 years of service) are assumed to elect a refund of contributions with interest (even though they are immediately vested in the College Plan).

**Proportions of members married at death**

For this valuation, we assumed that the surviving spouses of all vested members who die after age 55 would opt to take the commuted value of the pension earned to the date of death<sup>1</sup>. Therefore the proportions of members assumed to be married at death are irrelevant for this valuation. In the previous valuation, married members were assumed to have retired at the date of death, electing a 100% joint life and last survivor option, and we assumed that 90% of members would be married at death and that the husband's age would exceed the wife's age by 3 years.

**Growth of active College population**

We assumed in all the actuarial projections that there would be no future growth or decline in the College population. The same assumption was made in the previous valuation.

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<sup>1</sup> This corresponds with the revisions to the pre-retirement death benefit made in 2010. However, we would have made this assumption change even if the death benefit had not been changed, to recognize that spouses could opt to waive the default death benefit and thereby have the higher, commuted value based, benefit paid to their deceased spouse's estate.

**Expenses**

Administration expenses are paid out of the College fund. These amounts totaled 0.41%, 0.41% and 0.49% of salaries during fiscal 2010, 2011 and 2012 respectively. However, projected expenses provided by the Pension Corporation for the next few years estimate administration expenses will increase. Accordingly, we increased the expense provision from 0.45% of payroll used in the previous valuation to 0.60% of payroll, as part of the normal actuarial costs in the determination of the required contribution rates under the entry-age funding method. This provision represents the average projected expenses, expressed as a percentage of projected payroll, over the next valuation period. We also include a provision for the present value of expenses in the statement of actuarial position. The same methodology was used in the previous valuation.

As before, the investment management fees are excluded from our analysis above and from the expense provision we have made as they are reflected in the long-term investment return assumption.

**Refunds**

We continued with the interest assumption used for accumulation and refunds of member contributions to be 1.5% less than the valuation investment return assumption, i.e. at 5.0% per annum. This allows for the *PBSA*-related practice whereby the refund interest rate is set equal to an average of 5-year bank-term-deposit rates (which are assumed to be 1.5% less than fund earnings).

**Recognition of child-rearing periods for pension eligibility**

We continued to assume that this would only affect female members (while males are eligible for this benefit, the take-up rate for males does not justify an assumption that males will utilize it), and that, on average, it would increase the member's contributory service (which is used for determining pension eligibility) by 2 years; there would, of course, be no increase to the member's pensionable service (which is used for determining pension amounts). The impact of this would be to reduce the eligibility requirement for unreduced pensions between ages 55 and 59, from 35 years to 33 years, and we assumed that there would be no impact on the eligibility assumptions made for other benefits. The same assumption was made in the previous valuation.

**Plan termination**

The Standards of Practice issued by the Canadian Institute of Actuaries require that a valuation report "disclose the financial position of the plan if it were to be wound up on the calculation date, unless the plan does not define the benefits payable upon wind-up, in which case the actuary should include a statement to that effect".

The JTA, which sets out the governing framework under joint trusteeship does not address wind-up, and neither do the plan rules, therefore the benefits on wind-up are not defined. Accordingly, we no longer comment on the financial position of the plan if were to be wound up as we have done in previous valuations.

### **Funding Valuation: Fully indexed valuations - assumption changes**

We made the following changes to the assumptions when doing the fully indexed valuations:

- We combined the assets in the Basic and Inflation Adjustment Accounts, using a smoothed asset value of \$2,867,567,000;
- We applied an indexing assumption equal to the full assumed underlying inflation rate, i.e. 3.0% per annum. This indexing rate was applied both to pensions after retirement and during the pre-retirement period in the case of deferred vested pensions and disability salary accruals. For active members, our program applies the indexing on a continuous basis after retirement; for existing pensioners and deferred vesteds, the indexing is applied annually, in arrears; and
- We combined the contribution rates to Basic and IAA, i.e. we assumed a total member contribution rate of  $8.31\% + 1.38\% = 9.69\%$ , with a 0.75% integration for CPP (i.e. reduced by 0.75% of salaries below the YMPE). The total employer rate is assumed to be  $8.41\% + 1.38\% = 9.79\%$ , with a 0.75% integration for CPP. The 1% carve-out from the employer contributions for the non-pension benefits (EHB and Dental) was eliminated effective September 1, 2009.

### **Funding Valuation - Maximum pension rule - assumption changes**

As noted earlier, we have not applied the maximum pension rules when doing the primary Basic and Basic-plus-Indexed valuations. We have applied them, as described below, when doing the supplementary valuations with benefits limited to the *ITA* maximums.

The maximum annual pension currently permitted under the income tax rules is the lesser of:

- (i) \$2,646.67 in 2012 (\$2,696.67 in 2013) multiplied by the years of service; and
- (ii) 2% multiplied by the years of service further multiplied by the average of the best 3 years of remuneration paid to the member.

While the Plan applies the *ITA* limits only in respect of service after 1991, we have, for ease of calculation, assumed that this limit applies on all service; this assumption does not affect the future normal costs, but the accrued liabilities will be slightly understated. For an individual in this Plan to be currently affected by the \$2,646.67 maximum the final average salary must be very high and while current salaries are not such as to

cause many problems, the salaries projected in the future through application of the assumed salary increase rates outlined above are such that some individuals would be limited. However, under the income tax rules, the flat \$2,696.67 limit is automatically indexed each year after 2013 in accordance with increases in the average wage. Accordingly, we have applied a 3.75% per annum increase to the \$2,696.67 limit after 2013. (At the previous valuation the corresponding dollar limit was \$2,444.44 for 2009, \$2,494.44 for 2010, and after 2010 was assumed to increase by the average wage increase of 3.75%.)

It should also be noted that, in the tax-limited results, we valued the deferred vested pensions, in full, as provided to us, i.e. we were unable to carve out any "excess" portions. In the previous valuation we also valued the existing pensions in pay in full. Given the changes to the pension administration system, we were able to carve out the supplemental pensions in pay for this valuation.

## Appendix C: Active Member Data as at August 31, 2012

Age group <sup>1</sup>	Active members August 31, 2012 <sup>2</sup>			New entrants Sept. 1, 2007 to Aug. 31, 2012 and still active Aug. 31, 2012	
	Number	Average annual earnings <sup>3</sup> \$	Average service (years)	Number	Average annual earnings <sup>3</sup> \$
<b>Males</b>					
19-24	5	44,648	0.1	11	54,219
25-29	50	61,879	1.2	75	63,380
30-34	163	67,689	1.7	193	67,797
35-39	388	70,969	2.9	309	67,870
40-44	589	75,228	4.3	323	70,683
45-49	817	79,004	6.7	312	73,907
50-54	906	81,606	9.0	292	75,489
55-59	908	83,606	10.8	200	74,468
60 & over	959	84,942	13.6	134	78,654
<b>Total males</b>	<b>4,785</b>	<b>79,843</b>	<b>8.4</b>	<b>1,849</b>	<b>71,808</b>
<b>Females</b>					
19-24	13	40,760	0.1	21	47,849
25-29	135	59,665	0.9	209	62,087
30-34	349	64,438	1.8	377	64,268
35-39	594	69,610	3.1	415	66,742
40-44	823	72,499	4.8	389	68,373
45-49	922	76,362	6.5	364	69,212
50-54	1,120	77,884	8.2	372	71,011
55-59	1,103	80,153	10.8	204	71,463
60 & over	827	79,403	12.5	119	67,943
<b>Total females</b>	<b>5,886</b>	<b>75,399</b>	<b>7.4</b>	<b>2,470</b>	<b>67,521</b>
<b>Total males &amp; females</b>	<b>10,671</b>	<b>77,392</b>	<b>7.9</b>	<b>4,319</b>	<b>69,356</b>

A comparison of the August 31, 2012 active membership with the August 31, 2009 active membership is as follows:

<sup>1</sup> Age nearest birthday at August 31, 2012 for actives and at entry for new entrants.

<sup>2</sup> 2 actives excluded because of invalid data; 2,034 actives reclassified as inactive data.

<sup>3</sup> Actual earnings in fiscal 2012 for those employed all year and annualized for others. Zero, very low or very high earnings figures were replaced by the average earnings in the same age-sex group or the closest age group if there is only one member.

Active membership	Aug. 31, 2009	Aug. 31, 2012	Change 2009 to 2012
<b>Males</b>			
- Number	4,523	4,785	+ 5.8%
- Proportion of total	46.4%	44.8%	- 1.6%
- Average age (at 8.31)	50.2	50.9	+ 0.7 years
- Average service	8.3	8.4	+ 0.1 years
- Average salary	\$77,530	\$79,843	+ 3.0%
<b>Females</b>			
- Number	5,224	5,886	+ 12.7%
- Proportion of total	53.6%	55.2%	+ 1.6%
- Average age (at 8.31)	48.4	49.0	+ 0.6 years
- Average service	7.4	7.4	unchanged
- Average salary	\$73,505	\$75,399	+ 2.6%

The above comparison indicates a continuing increase in both the male and female membership during the 3 year inter-valuation period, with a relatively larger increase in the number of females. As a result, the proportion of males to females continues to decrease. The average age has increased for both males and females, notwithstanding the increase in the covered membership.

A comparison of the new entrant subset used at August 31, 2012 with that used at August 31, 2009 in determining the entry-age normal costs is as follows:

New entrants	Aug. 31, 2009	Aug. 31, 2012	Change 2009 to 2012
<b>Males</b>			
- Number	1,892	1,849	- 2.3%
- Proportion of total	44.9%	42.8%	- 2.1%
- Average age at entry	44.5	44.9	+ 0.4 years
- Average salary	\$70,702	\$71,808	+ 1.6%
<b>Females</b>			
- Number	2,321	2,470	+ 6.4%
- Proportion of total	55.1%	57.2%	+ 2.1%
- Average age at entry	42.3	42.7	+ 0.4 years
- Average salary	\$66,344	\$67,521	+ 1.8%

The number of new entrants in the five year period preceding the valuation date has decreased for males and increased for females. The average age of new entrants has increased slightly since 2009. The average salary increases for new entrants are lower than the average salary increases for actives.

## Appendix D: Inactive Member Data as at August 31, 2012

### 1. Inactive Members Assumed Reactivated on Valuation Date

Age group <sup>1</sup>	Males			Females		
	Number	Average annual earnings <sup>2</sup>	Average service (years)	Number	Average annual earnings <sup>2</sup>	Average service (years)
25-34	4	\$65,321	2.3	5	\$64,572	2.9
35-39	10	71,757	3.4	22	70,026	3.1
40-44	22	75,421	3.6	32	72,467	4.3
45-49	35	78,591	4.4	30	76,264	4.5
50-54	33	81,591	5.1	51	77,894	5.1
55-59	19	83,210	5.2	34	80,131	6.1
60 & over	29	85,090	4.2	30	78,614	4.1
<b>Total</b>	<b>152</b>	<b>79,802</b>	<b>4.4</b>	<b>204</b>	<b>76,107</b>	<b>4.7</b>

	Number	Average annual earnings <sup>2</sup>	Average service
Total males & females	356	\$77,684	4.5 years

### 2. Members on Long-Term Disability

Age group <sup>1</sup>	Males			Females		
	Number	Average annual earnings	Average service (years)	Number	Average annual earnings	Average service (years)
30-39	-	\$0	-	5	\$73,859	5.3
40-44	-	-	-	8	73,330	5.9
45-49 <sup>3</sup>	10	76,180	7.4	15	73,923	9.9
50-54	10	76,213	11.8	24	76,866	12.9
55-59	23	81,835	16.7	39	80,243	17.6
60 & over	37	86,089	19.5	54	78,572	19.7
<b>Total</b>	<b>80</b>	<b>82,393</b>	<b>16.2</b>	<b>145</b>	<b>77,806</b>	<b>15.8</b>

<sup>1</sup> Age nearest birthday at August 31, 2012.

<sup>2</sup> Assumed same earnings as per the average for active members of the in same age and sex.

<sup>3</sup> 2 males 40-44 included in 45-49 row due to privacy.

**3. Other Inactive Members Assumed Electing Vested Pensions**

Age group <sup>1</sup>	Males			Females		
	Average annual vested pensions			Average annual vested pensions		
	Number	Initial <sup>2</sup>	Offset at age 65	Number	Initial <sup>2</sup>	Offset at age 65
25-29	0	\$0	\$0	7	\$1,304	\$182
30-34	23	1,857	208	45	1,676	204
35-39	59	1,915	218	126	2,545	298
40-44	98	4,158	428	173	2,790	323
45-49	164	5,506	533	254	4,055	465
50-54	247	6,834	670	293	6,340	672
55-59	241	6,821	676	278	6,231	702
60 & over	218	3,905	494	173	3,740	468
<b>Total</b>	<b>1,050</b>	<b>5,380</b>	<b>555</b>	<b>1,349</b>	<b>4,562</b>	<b>515</b>

**4. Remaining Inactive Members**

Number <sup>3</sup>	Member contributions with interest
4,072	\$4,172,082

<sup>1</sup> Age nearest birthday at August 31, 2012.

<sup>2</sup> These pensions are assumed to commence at the first age at which the member is entitled to an unreduced pension, i.e. at various ages between 60 and 65.

<sup>3</sup> Includes 2 active and 9 disabled members with invalid data.

## Appendix E: Pensioner Data as at August 31, 2012

### 1. Former Contributors

Age group <sup>1</sup>	Number of pensioners <sup>2</sup>	Annual Pensions (\$000's) <sup>3</sup>				
		Single life	Joint life & survivor	Joint life & survivor with guarantee	Single life with guarantee	Temporary life
<b>Male pensioners</b>						
Less than 60	97	-	-	1,108	610	394
60-64	451	426	504	6,056	3,108	1,909
65-69	812	1,704	4,395	8,990	4,581	313
70-74	630	2,819	5,722	2,645	2,686	-
75-79	319	2,300	3,068	91	563	-
80-84	203	1,511	1,313	-	25	-
85-89	93	611	406	-	-	-
90 & over	38	281	126	-	-	-
<b>Total</b>	<b>2,643</b>	<b>9,652</b>	<b>15,534</b>	<b>18,890</b>	<b>11,573</b>	<b>2,616</b>
<b>Female pensioners</b>						
Less than 60	189	-	-	1,251	1,737	605
60-64	557	1,099	377	4,199	6,078	2,060
65-69	725	3,793	1,611	3,846	6,119	246
70-74	370	3,199	1,095	635	1,951	-
75-79	165	1,883	355	-	223	-
80-84	99	983	100	-	-	-
85-89	47	524	5	-	-	-
90 & over	22	176	-	-	-	-
<b>Total</b>	<b>2,174</b>	<b>11,657</b>	<b>3,543</b>	<b>9,931</b>	<b>16,108</b>	<b>2,911</b>
<b>Grand Total</b>	<b>4,817</b>	<b>21,309</b>	<b>19,077</b>	<b>28,821</b>	<b>27,681</b>	<b>5,527</b>

Supplemental pensions included in the above amounts are as follows:

<b>Supplemental Pensions included</b>	<b>21</b>	<b>66</b>	<b>223</b>	<b>155</b>	<b>-</b>
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<sup>1</sup> Age nearest birthday at August 31, 2012.

<sup>2</sup> These numbers include only those who were formerly contributors to the plan.

<sup>3</sup> Including supplements to January 1, 2012.

## 2. Beneficiaries

Age group <sup>1</sup>	Number of beneficiaries <sup>2</sup>	Annual Pensions (\$000's) <sup>3</sup>	
		Single life	Single life with guarantee
<b>Male beneficiaries</b>			
Less than 55	3	20	5
55-59	4	1	36
60-64	11	103	35
65-69	8	29	110
70-74	11	91	101
75-79	6	51	1
80 & over	6	32	46
<b>Total</b>	<b>49</b>	<b>327</b>	<b>334</b>
<b>Female beneficiaries</b>			
Less than 55	11	68	59
55-59	13	73	18
60-64	27	297	169
65-69	42	467	246
70-74	59	890	142
75-79	40	621	-
80-84	49	556	-
85-89	35	302	-
90 & over	23	342	-
<b>Total</b>	<b>299</b>	<b>3,616</b>	<b>634</b>
<b>Remaining guarantees</b>	<b>25<sup>4</sup></b>	<b>-</b>	<b>490</b>
<b>Grand Total</b>	<b>373</b>	<b>3,943</b>	<b>1,458</b>

Supplemental pensions included in the above amounts are as follows:

<b>Supplemental Pensions included</b>	<b>13</b>	<b>3</b>
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<sup>1</sup> Age nearest birthday at August 31, 2012.

<sup>2</sup> These numbers include spouses (or estates) currently receiving benefits where the former contributor is deceased.

<sup>3</sup> Including supplements to January 1, 2012.

<sup>4</sup> Including 1 beneficiary with zero year guarantee period and no further liability.

## Appendix F: Development of Required Contribution Rates

All of the figures shown herein are on a combined member/employer basis and integrated.

	2012	2009
<b>Normal ("entry-age") actuarial cost portion</b>	<b>%</b>	<b>%</b>
Males	16.70	16.48
Females	16.94	16.81
Combined	16.84	16.66

The change in the normal actuarial cost from 2009 to 2012 can be traced as follows:

	Males (%)	Females (%)	Combined (%)
<b>Normal cost at 2009 valuation</b>	<b>16.48</b>	<b>16.81</b>	<b>16.66</b>
Data changes	0.02	-	0.01
Assumption changes:			
▪ pre-retirement deaths electing a CV	0.03	0.04	0.04
▪ pre-retirement mortality	-	-	-
▪ disability incident rates	(0.01)	(0.01)	(0.01)
▪ withdrawal rates	(0.11)	(0.15)	(0.13)
▪ retirement rates	(0.04)	(0.02)	(0.03)
▪ post-retirement mortality	0.17	0.11	0.14
▪ post-retirement mortality for disabled pensioners	0.01	0.01	0.01
Expense changes	0.15	0.15	0.15
<b>Total change</b>	<b>0.22</b>	<b>0.13</b>	<b>0.18</b>
<b>Normal cost at 2012 valuation</b>	<b>16.70</b>	<b>16.94</b>	<b>16.84</b>

**Calculation of Required Contribution Rate**

	<b>2012</b>	<b>2009</b>
<b>A. Normal (entry-age) actuarial cost</b>	<b>16.84%</b>	<b>16.66%</b>
<b>B. Unfunded actuarial liability on entry-age basis (\$000s)</b>	(108,972)	(4,115)
<b>C. Present value of existing amortization requirements (\$000s)</b>		
(i) 0.06% to 2021 (0.08% to 2021 in 2009 column)	3,576	5,553
<b>D. Balance of unfunded liability to be amortized over 15 years (\$000s) (= B + C)</b>	(105,396)	
<b>Present value of existing amortization in excess of unfunded liability (\$000s) (= B + C)</b>		1,438
	%	%
<b>E. 15 year amortization of balance of unfunded actuarial liability</b>	1.14	n/a
<b>Reduction of existing amortization</b>	n/a	(0.02)
<b>F. Total PBSA amortization requirement</b>		
(i) to 2021	0.06	0.08
(ii) to 2027	1.14	n/a
(iii) existing amortization reduction	n/a	(0.02)
<b>Total</b>	<b>1.20</b>	<b>0.06</b>
<b>G. Total PBSA required contribution rate</b>	<b>18.04</b>	<b>16.72</b>

The percentages are applied to members' total earnings and are reduced for the amount below the YMPE. For both 2009 and 2012, the reduction is 0.75% of each member's salary up to the YMPE for each of the members and the employers, for a 1.5% total reduction.

## Appendix G: Comparative Results

### Comparative Funding Valuation Results on Fully Indexed Basis, and with Income Tax Limits

The results herein are analogous to those contained in Schedules 1, 3 and 5 in the body of the report. For ease of comparison, we have repeated the 2012 Basic Account results; selected 2009 comparisons are also shown. The results are included for:

- Basic (i.e. non-indexed) benefits only, no tax limits;
- Basic plus Indexed, no tax limits;
- Basic only, with tax limits; and
- Basic plus Indexed, with tax limits

## Schedule G1<sup>1</sup> – Statement of Actuarial Position as at August 31, 2012

### Present Plan – (\$000's)

	No Tax Limits		With Tax Limits	
	Basic Only	Basic + Indexed	Basic Only	Basic + Indexed
<b>Assets</b>				
Market value of Fund	2,598,671	2,922,998	2,598,671	2,922,998
Asset smoothing adjustment	(49,281)	(55,431)	(49,281)	(55,431)
<b>Smoothed value of Fund</b>	<b>2,549,390</b>	<b>2,867,567</b>	<b>2,549,390</b>	<b>2,867,567</b>
Actuarial present values of:				
▪ future contributions at entry-age rates	960,562	1,333,358	956,937	1,329,128
▪ present value of existing amortization				
(i) 0.06% to 2021	3,576	3,576	3,576	3,576
<b>Total Assets</b>	<b>3,513,528</b>	<b>4,204,501</b>	<b>3,509,903</b>	<b>4,200,271</b>
<b>Liabilities</b>				
Actuarial present values for:				
▪ pensions being paid	1,179,613	1,590,381	1,173,832	1,582,488
▪ inactive members	172,621	271,242	172,586	271,197
▪ active members	2,230,438	3,101,748	2,224,219	3,093,231
▪ future expenses	36,252	36,252	36,252	36,252
<b>Total Liabilities</b>	<b>3,618,924</b>	<b>4,999,623</b>	<b>3,606,889</b>	<b>4,983,168</b>
<b>Surplus (Unfunded Actuarial Liability)</b>	<b>(105,396)</b>	<b>(795,122)</b>	<b>(96,986)</b>	<b>(782,897)</b>
Present value of existing amortization	0	(3,576)	0	(3,576)
<b>Surplus (Unfunded Liability) to be amortized over 15 years</b>	<b>(105,396)</b>	<b>(798,698)</b>	<b>(96,986)</b>	<b>(786,473)</b>
<b>Selected 2009 Comparisons</b>				
Total Assets including amortization	3,109,665	3,729,817	3,106,227	3,724,661
Total Liabilities	3,109,665	4,278,238	3,102,834	4,268,953
Surplus (Unfunded Actuarial Liability)	0 <sup>2</sup>	(548,421) <sup>3</sup>	3,393 <sup>4</sup>	(544,292) <sup>5</sup>

<sup>1</sup> This Schedule combines schedules G1 and G2 from the 2009 report.

<sup>2</sup> Prior to the 2009 amortization of 0.06% of salary, the unfunded liability was \$4,115 thousand.

<sup>3</sup> Prior to the 2009 amortization of 0.06% of salary, the unfunded liability was \$552,536 thousand.

<sup>4</sup> Prior to the 2009 amortization of 0.06% of salary, the unfunded liability was \$722 thousand.

<sup>5</sup> Prior to the 2009 amortization of 0.06% of salary, the unfunded liability was \$548,407 thousand.

## Schedule G3 – Current and Required Contribution Rates – August 31, 2012

	No Tax Limits		With Tax Limits	
	Basic Only (%)	Basic + Indexed (%)	Basic Only (%)	Basic + Indexed (%)
<b>Current contribution rates</b>				
Member <sup>1,2</sup>	8.31	9.69	8.31	9.69
Employer <sup>1,2</sup>	8.41	9.79	8.41	9.79
<b>Combined member/employer</b>	<b>16.72</b>	<b>19.48</b>	<b>16.72</b>	<b>19.48</b>
<b>Required contribution rates</b>				
<b>Entry age normal cost rate<sup>1</sup></b>	<b>16.84</b>	<b>23.01</b>	<b>16.78</b>	<b>22.94</b>
Amortization of unfunded actuarial liability (surplus)				
▪ 25 year amortization	0.80	5.86	0.74	5.77
▪ 15 year amortization	1.18	8.66	1.09	8.53
▪ <i>PBSA</i> amortization	1.20	n/a	1.11	n/a
<b>Total contribution rate<sup>1</sup></b>				
▪ 25 year amortization	17.64	28.87	17.52	28.71
▪ 15 year amortization	18.02	31.67	17.87	31.47
▪ <i>PBSA</i> rate	18.04	n/a	17.89	n/a
<b>Total required contribution rate<sup>1</sup></b>	<b>18.04</b>	<b>n/a</b>	<b>17.89</b>	<b>n/a</b>
<b>Selected 2009 Comparisons</b>				
Member <sup>1</sup>	8.12	9.50	8.12	9.50
Employer <sup>1,3</sup>	8.12	9.50	8.12	9.50
<b>Combined member/employer</b>	<b>16.24</b>	<b>19.00</b>	<b>16.24</b>	<b>19.00</b>
<b>Required contribution rates</b>				
<b>Entry age normal cost rate<sup>1</sup></b>	<b>16.66</b>	<b>22.70</b>	<b>16.60</b>	<b>22.61</b>
Amortization of unfunded actuarial liability (surplus)				
▪ 25 year amortization	0.03	4.46	0.01	4.42
▪ 15 year amortization	0.05	6.59	0.01	6.54
▪ <i>PBSA</i> amortization	0.06	n/a	0.01	n/a
<b>Total contribution rate<sup>1</sup></b>				
▪ 25 year amortization	16.69	27.16	16.61	27.03
▪ 15 year amortization	16.71	29.29	16.61	29.15
▪ <i>PBSA</i> rate	16.72	n/a	16.61	n/a
<b>Total required contribution rate<sup>1</sup></b>	<b>16.72</b>	<b>n/a</b>	<b>16.61</b>	<b>n/a</b>

<sup>1</sup> Less 0.75% of salary up YMPE (for each of the members and the employers).

<sup>2</sup> Non-indexed costs ignore IAA contributions; indexed costs include IAA contributions, of 1.38% for members and 1.38% for employers for 2012.

<sup>3</sup> Based on IAA contribution rates of 1.38% for both members and employers effective September 1, 2010.

**Schedule G4 – Accrued Liabilities and Funded Ratio – August 31, 2012**

(\$000's)	No Tax Limits		With Tax Limits	
	Basic Only	Basic + Indexed	Basic Only	Basic + Indexed
<b>Assets – smoothed value</b>	<b>2,549,390</b>	<b>2,867,567</b>	<b>2,549,390</b>	<b>2,867,567</b>
<b>Accrued Liabilities</b>				
▪ for pensions being paid	1,179,613	1,590,381	1,173,832	1,582,488
▪ for inactive members	172,621	271,242	172,586	271,197
▪ for active members	1,218,996	1,692,156	1,214,987	1,686,689
<b>Total Accrued Liabilities</b>	<b>2,571,230</b>	<b>3,553,779</b>	<b>2,561,405</b>	<b>3,540,374</b>
<b>Surplus (Unfunded Actuarial Liability)</b>	<b>(21,840)</b>	<b>(686,212)</b>	<b>(12,015)</b>	<b>(672,807)</b>
<b>Funded Ratio – Fund ÷ Total Accrued Liabilities</b>	<b>99.2%</b>	<b>80.7%</b>	<b>99.5%</b>	<b>81.0%</b>
<b>Selected 2009 Comparisons</b>				
Assets	2,202,457	2,476,542	2,202,457	2,476,542
Total Liabilities	2,128,928	2,929,547	2,124,604	2,923,693
Surplus (Unfunded Actuarial Liability)	(73,529)	(453,005)	77,853	(447,151)
Funded Ratio	103.5%	84.5%	103.7%	84.7%

## Appendix H: Actuarial Position on Current Contribution Basis as at August 31, 2012

The following shows the results of the August 31, 2012 valuation assuming that member and employer contribution rates for the basic pensions continue to be made at the current rates set out in the Plan rules. It replicates Schedule 1 under Part 1 of Section IV of the 2009 report.

### Basic Account – Non-Indexed Benefits (\$000's)

	2012	2009
<b>Assets</b>		
Market Value of Basic Account	2,598,671	2,056,187
Asset Smoothing Adjustment	(49,281)	146,270
Smoothed Value of Basic Account	2,549,390	2,202,457
Actuarial present values of:		
▪ Future members contributions of current rates	473,635	439,514
▪ Future employer contributions of current rates	479,677	439,514
<b>Total Assets</b>	<b>3,502,702</b>	<b>3,081,485</b>
<b>Liabilities</b>		
Actuarial present values for:		
▪ Pensions being paid	1,179,613	899,902
▪ Inactive members	172,621	167,263
▪ Active members	2,230,438	2,016,717
▪ Future expenses	36,252	25,783
<b>Total Liabilities</b>	<b>3,618,924</b>	<b>3,109,665</b>
<b>Surplus (Unfunded Actuarial Liability)</b>	<b>(116,222)</b>	<b>(28,180)</b>