

Actuarial Report on

**British Columbia College
Pension Plan**

Related to Valuation
as at August 31, 2009

Vancouver, B. C.

May 13, 2010

Contents

Actuarial Report Highlights.....	1
Scope of Valuation.....	1
Plan Changes.....	1
Actuarial Methods and Assumptions.....	2
Funding Valuation Results.....	3
Main Reasons for Changes in Funding Valuation Actuarial Position.....	3
Member and Employer Contribution Rates – Basic Non-Indexed Benefits.....	4
Combined Basic plus IAA Contribution Rates.....	4
I. Scope of the valuation.....	6
II. Changes in Plan.....	7
III. Actuarial methods and assumptions.....	8
IV. Results of the funding valuation.....	14
V. Sustainable indexing valuation.....	25
VI. Subsequent events.....	27
VI. Actuarial opinion.....	27
VII. Acknowledgement.....	27
Appendix A.....	28
Appendix B.....	41
Appendix C.....	59
Appendix D.....	62
Appendix E.....	64
Appendix F.....	66
Appendix G.....	68
Schedule G1 – Statement of Actuarial Position as at August 31, 2009.....	i
Schedule G2 – Develop Surplus (Unfunded Actuarial Liability) on Entry Age Basis.....	ii
Schedule G3 – Current and Required Contribution Rates – August 31, 2009.....	iii
Schedule G4 – Accrued Liabilities and Funded Ratio.....	iv

Actuarial Report Highlights

BC College Pension Plan

August 31, 2009

An actuarial valuation of the College Pension Plan was completed as at August 31, 2009.

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, 2009 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.

The Sustainable Indexing Valuation is new, and has been introduced as a result of the move to a sustainable indexing approach, as described in the plan rules and the Board's funding policy.

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").

Plan Changes

Key plan changes included in the valuation were:

- Effective September 1, 2007, member and employer contribution rates were increased to 7.37% of pensionable salary up to the Yearly Maximum Pensionable Earnings ("YMPE"), 8.12% on pensionable salary above the YMPE to the Basic Account.
- Effective September 1, 2009, member and employer IAA contribution rates were increased to 1.34% of pensionable salary each.

- Effective September 1, 2009, the post-retirement group benefit subsidies were eliminated, so there is no longer a 1% "carve-out" of the gross IAA contributions from the employer as allowed for at previous valuations.
- Effective September 1, 2009, the 35 years cap on the service was removed.
- Effective September 1, 2010, section 73 of the plan text, dealing with indexing, was amended such that indexing is to be limited to the lower of the increase in the consumer price index and a maximum amount recommended by the actuary, which is expected to be sustainable in the long term.
- Effective September 1, 2010, member and employer IAA contribution rates will be increased to 1.38% of pensionable salary each.
- Effective September 1, 2010, the employer contribution rate to the basic account will be adjusted so as to be 0.1% of pensionable salary higher than the member contribution rate.

Actuarial Methods and Assumptions

The liabilities include the value of benefits accrued by members as at August 31, 2009 as well as future benefits expected to be earned by existing members. Asset values are based on smoothed market values, plus projected future contributions at the current contribution rate.

The contribution rates are tested on the entry-age contribution method.

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% (was 6.75%)	6.75% (new)
Annual Salary Increase	3.75% (was 4.0%) plus seniority	3.50% (new) plus seniority
Annual Indexing	0% for basic costs (no change) 3.0% for indexed costs (was 3.25%)	2.75% for fully indexed costs (new) Sustainable level of indexing calculated as valuation output (new)

Funding Valuation Results

The Funding Valuation indicates an improvement in the actuarial position for the Basic Account, from an unfunded liability of \$54 million as at August 31, 2006, to an unfunded liability of \$28 million as at August 31, 2009:

Basic Benefits Only: (\$000's)	2009	2006
Assets	3,081,485	2,409,479
Liabilities	3,109,665	2,463,362
Surplus (Unfunded Liability)	(28,180)	(53,883)

The supplementary valuation results are:

Basic and Indexed Benefits: (\$000's)	2009	2006
Assets	3,513,708	2,715,945
Liabilities	4,278,238	3,449,548
Surplus (Unfunded Liability)	(764,530)	(733,603)

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

Benefits Limited to ITA Maximums: (\$000's)	2009	2006
Surplus (Unfunded Liability) (\$000's)		
Basic benefits only	(21,349)	(47,342)
Basic and indexed benefits	(755,245)	(724,520)

Main Reasons for Changes in Funding Valuation Actuarial Position

- smoothed investment returns higher than assumed
- actual salary increases lower than long-term assumption
- increase in contribution rates;

offset by

- change in the investment return/salary increase assumptions; and
- changes in demographic assumptions.

Member and Employer Contribution Rates – Basic Non-Indexed Benefits

Members and employers currently each contribute 8.12% of salaries, less 0.75% of salaries up to the YMPE. Ignoring the unfunded liability, the normal actuarial cost on the entry age basis, i.e. the long-term cost rate for future service, is 16.66% of salaries, or 0.42% higher than the current combined member/employer rate of 16.24%.

The *Public Sector Pension Plans Act* (i.e. the legislation governing the joint trusteeship arrangement under which the Plan operates), and the Board's funding policy, requires that the contribution rates comply with the going-concern requirements of the provincial pension standards legislation (the *PBSA*).

Taking into account the entry-age cost rates, the unfunded liability is \$4 million. Amortizing this as required by the *PBSA* results in a required contribution of 16.72%. 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 16.72% (integrated at 0.75% x 2) is 0.48% higher than the current rate of 16.24% (integrated at 0.75% x 2). This increase in the required contribution rate must be shared between members and employers, such that the employer rate is 0.1% higher than the member rate resulting in an increase of 0.19% for member and 0.29% for employer, or 0.48% in total.

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	8.12% ¹	8.12% ¹	16.24% ¹
- plus new Basic	0.19%	0.29%	0.48%
- current IAA	1.38%	1.38%	2.76%
- total	9.69% ¹	9.79% ¹	19.48% ¹

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 provided members do not contribute more than half the cost of benefits. The required

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

contributions exceed 9% of salaries so it will be necessary to apply to the Minister for an exemption. The employer contributions of 9.79% exceed the member contributions of 9.69% and therefore the requirement that the member contributions will not exceed half of the amount required to fund the aggregate benefits is met.

The total required contribution rate of 19.48% is acceptable in terms of the *ITA*.

Sustainable Indexing Valuation

The Sustainable Indexing Valuation shows that indexing of 1.83% per year is sustainable in the long term.

The College Pension Board of Trustees,
395 Waterfront Crescent,
Victoria BC V8T 5K7

I. Scope of the valuation

In accordance with Section 12 of Schedule A of the *Public Sector Pension Plans Act* (the "Act") and on your instructions, 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, 2009 and are pleased to submit this report thereon. Two primary valuations were carried out:

- **A Funding Valuation** - to determine the financial position of the Basic Account as at August 31, 2009 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.
- **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. The Sustainable Indexing Valuation is new, and has been introduced as a result of the move to a sustainable indexing approach from January 2011 onwards, as described in the plan rules and the Board's funding policy.

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.

II. Changes in Plan

The last valuation of the Plan, prepared as at August 31, 2006 and included in our report dated May 15, 2007, determined the financial position of the Plan as amended to August 2006. Since then, a number of changes have been made to the Plan. Certain of these changes become effective after the valuation date. Where such changes effect the financial position of the plan, we have taken them into account as if they applied at the valuation date. The major changes affecting the Plan's financing include:

- Effective September 1, 2007, member and employer Basic Account contribution rates were increased to 7.37% of pensionable salary up to the Yearly Maximum Pensionable Earnings ("YMPE") and 8.12% on pensionable salary above the YMPE.
- Effective September 1, 2009, member and employer IAA contribution rates were increased by 0.25% of pensionable salary from 1.09% to 1.34% of pensionable salary each.
- Effective September 1, 2009, the post-retirement group benefit subsidies paid by the employer have been eliminated.
- Effective September 1, 2009, the 35 years cap on the service was removed.
- Effective September 1, 2010, section 73 of the plan text, dealing with indexing, was amended such that indexing is to be limited to the lower of the increase in the consumer price index and a maximum amount recommended by the actuary, which is expected to be sustainable in the long term.
- Effective September 1, 2010, member and employer Basic contribution rates will be decreased by 0.04% of pensionable salary each. This decrease will be applied concurrently with any adjustment to the Basic contribution rate resulting from this valuation.
- Effective September 1, 2010, member and employer IAA contribution rates will be increased to by 0.04% of pensionable salary each, from 1.34% to 1.38% of pensionable salary.
- Effective September 1, 2010, the employer contribution rate to the basic account will be 0.1% of pensionable salary higher than the member contribution rate.

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 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 first determined the financial status of the Plan for the Basic Account only (i.e. ignoring any indexing granted after August 31, 2009) taking into account the current rates of contribution. The methods used are described in Appendix B. The valuation of the liabilities includes 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; the present value of projected future contributions in respect of the existing members, at the current rates, is also included as an asset.

(b) Funding Requirements

The approach to setting contribution rates is set out in the funding policy adopted by the Board in March 2003 and amended in December 2009, and is described in the following sections.

(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, percentage rate 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 not generate unfunded liabilities.

Next, active members in the system must be considered. The valuation assets are re-determined, assuming future contributions for existing members are now made at the entry-age rate rather than at the current rate. The resulting net financial position, which will differ from that calculated taking into account the current contribution rates, may be either an actuarial surplus or an unfunded actuarial liability.

This surplus, if any, is amortized over 25 or 15 years; an unfunded liability is amortized over 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, under the current joint trusteeship arrangement the *Act* 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 but, with respect to the employer share of the requirements, only 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 current *Act* (Schedule A, sections 15(4) and (5)) requires the Board to use a 25 year period for the amortization of a surplus when considering its application towards benefit improvements without the prior approval of the Plan's partners, in order to provide a measure of contribution rate stability.

The Board's funding policy reflects these constraints, as follows:

- Calculate the "normal cost rate" (i.e. the "entry-age rate") and the resulting surplus (or unfunded liability) using this rate,
- If there is an unfunded liability, we assume that additional contributions at the rates required to amortize the previously identified unfunded liabilities will continue for the remainder of their 15 year amortization periods. Any remaining balance is amortized 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 unfunded liability, we apply the gain proportionally over the remaining periods. This results in a reduction in the required amortization rates, with the revised rates in effect for the previously established periods.
- If 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 joint trust arrangement 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 intergeneration 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. At the previous valuation, only one set of assumptions, corresponding to the Funding Valuation Assumptions, was required.

Following discussions with the Board, we adjusted the Funding Valuation economic assumptions by reducing the rate of investment return by 0.25% and the rate of salary increase by 0.25%, we also 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.

	Funding Valuation	Sustainable Indexing Valuation
Annual Investment Return	6.5% (was 6.75%)	6.75% (new)
Annual Salary Increase	3.75% (was 4.0%) plus seniority	3.50% (new) plus seniority
Annual Indexing	0% for basic costs (no change) 3.0% for indexed costs (was 3.25%)	2.75% for fully indexed costs (new) Sustainable level of indexing calculated as valuation output (new)

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, 2009 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

In the previous valuation, the treatment of non-pension benefits did not affect the Basic Account valuation results. With respect to the indexed valuation results, we reduced the employer contributions to the IAA by 1% of salaries (to 0.09% of salaries), being the potential amount that could be allocated to the non-pension benefits. We did not otherwise consider the liabilities and the financing for these benefits.

Effective September 1, 2009, these non-pension benefits have been eliminated, so there is no longer a 1% "carve-out" of the gross IAA contributions from the employer.

IV. Results of the funding valuation

1. Basic Account - Actuarial Position on Current Contributions

Schedule 1 shows a statement of the actuarial position of the Plan as at August 31, 2009. 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 continue to be made at the current rates set out in the Plan rules.

Schedule 1 - Statement of Actuarial Position as at August 31, 2009

Basic Account – Non-Indexed Benefits – Current Contributions

	(\$000's)	
Assets	2009	2006
Market Value of Basic Account	2,056,187	1,821,975
Asset Smoothing Adjustment	146,270	(151,950)
Smoothed Value of Basic Account	2,202,457	1,670,025
Actuarial present values of		
- future member contributions at current contribution rates	439,514	369,727
- future employer contributions at current contribution rates	439,514	369,727
Total Assets	3,081,485	2,409,479
Liabilities		
Actuarial present values for		
- pensions being paid	899,902	605,532
- inactive members	167,263	122,575
- active members	2,016,717	1,711,930
- future expenses	25,783	23,325
Total Liabilities	3,109,665	2,463,362
Surplus (Unfunded Actuarial Liability)	(28,180)	(53,883)

2. Change in Actuarial Position

The statement of actuarial position included in Schedule 1 indicates a decrease in the unfunded actuarial liability, from \$54 million as at August 31, 2006 to \$28 million as at August 31, 2009. The \$26 million improvement is the net result of a number of items, the most significant items being the increase in contribution rates following the 2006 valuation and higher than assumed investment returns, offset by the change in the assumptions:

	Approximate effect on unfunded liability (\$ millions)
1. Unfunded liability at August 2006	(54)
2. Interest on (unfunded liability)	– 12
3. Actual income from investments in excess of 6.75% assumed rate (on smoothed values)	+ 57
4. Actual salary increases to August 31, 2006 lower than previously assumed	+ 7
5. Contributions below normal cost rate for new entrants	– 8
6. Change in contribution rates following the 2006 valuation	+ 58
7. Changes in valuation assumptions	– 102
8. Other factors (a net gain) including changes in plan membership and other differences between actuarial assumptions and actual experience during the intervalation period	+ 26
9. Unfunded liability at August 2009	(28)

The (\$102) million figure in item (7) is the net result of the following:

	(\$ millions)
Assumption changes:	
▪ investment return/salary increase	– 80
▪ withdrawal rate	+ 3
▪ retirement rate	+ 5
▪ post-retirement mortality	– 30
	– 102

The assumption changes are described in Appendix 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) Change in 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 16.15% of salaries as at August 31, 2006 to 16.66% of salaries as at August 31, 2009.

The increase in rates is developed in Appendix F and is the net result of a number of items, chiefly the change in the investment return/salary increase assumptions (cost increase of 0.43%)

(b) Change in Amortization

As a first step in the development of the amortization requirement, the future contribution rates are assumed to be set at the entry-age normal cost rate, i.e. at 16.66% of payroll (instead of at the current rate of 16.24%, as in Schedule 1). The resulting surplus (unfunded liability) will differ from that shown in Schedule 1, and it is this adjusted balance that must be amortized to obtain the adjustment to the normal cost. The adjustments to the contributions and surplus (unfunded liability) figures in Schedule 1 are summarized in Schedule 2.

Schedule 2 - Develop Surplus (Unfunded Actuarial Liability) on Entry-Age Basis¹

	(\$000's)	
	2009	2006
(a) Surplus (unfunded liability) on current contribution basis	(28,180)	(53,883)
(b) Present value of future contributions at		
(i) entry-age rates	903,093	787,509
(ii) current rates	879,028	739,454
(iii) = (i) - (ii)	24,065	48,055
(c) Surplus (unfunded liability) on entry-age basis = (a) + (b)(iii)	(4,115)	(5,828)
(d) Present value of existing amortization requirements		
(i) 0.08% to 2021	5,553	5,828
(e) Balance of surplus (unfunded liability) = (c) + (d)	1,438	0

Thus the 2009 amortization is based on an unfunded liability of \$4,115,000.

(c) 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 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, such that the unfunded liability is amortized over the balance of the previously established amortization terms.

The present value of the remaining amortization requirements identified in 2006, payable at a rate of 0.08% of salaries until 2021, is \$5,553,000. After taking this into account, there is a surplus of \$1,438,000. Therefore the existing amortization rate of 0.08% is reduced to 0.06%, such that the unfunded liability of \$4,115,000 is amortized over the balance of the amortization term identified in 2006.

The minimum *PBSA* requirement is therefore equal to the normal cost of 16.66% plus the amortization requirement of 0.06% for a total contribution rate of 16.72% of salaries (integrated).

The current contribution rates, the contribution rates for current service (on an entry-age basis, i.e. the normal actuarial cost), the payments required to amortize the resulting surplus/(unfunded liability), and the contribution rate required by the *PBSA* are summarized in Schedule 3. Each of these items is discussed in

¹ The 2006 and earlier valuation reports referred to this schedule as "Schedule 3".

more detail in the ensuing pages. From 2000 onwards, any increase or decrease in contribution rates is to be shared equally between members and employers, except for this valuation, where the contribution increase for the employers is 0.1% more than the increase for members.

Schedule 3 - Current and Required Contribution Rates for Basic Non-Indexed Benefits¹

Current contribution rates	Based on valuation results as at August 31,	
	2009 (%)	2006 (%)
Member ²	8.12	7.61
Employer ²	8.12	7.61
Combined member/employer²	16.24	15.22
Required contribution rates		
Entry-age normal cost rate ²	16.66	16.15
Amortization of unfunded actuarial liability (surplus) ³		
• 25 year amortization	0.03	0.05
• 15 year amortization	0.05	0.08
• PBSA Amortization⁴	0.06	0.08
Total required contribution rate		
• 25 year amortization	16.69	16.20
• 15 year amortization	16.71	16.23
• PBSA	16.72	16.23

The above results indicate a total required contribution rate of 16.72% of salaries compared to the current rate of 16.24%, i.e. the current rate must be increased by 0.48% of salaries over its current level.

¹ The 2006 and earlier valuations reports referred to this schedule as "Schedule 2".

² Less 0.75% of salary up to YMPE (for each of the members and the employers) and exclusive of contributions required for indexed supplementary pensions.

³ Based on the entry-age unfunded liability developed in Schedule 2 above, and not on the unfunded liability indicated in Schedule 1.

⁴ Consisting of 0.06% of salaries for 12 years to 2021.

4. Revised Contribution Rates

The current and revised required rates are summarized below. As per the Trustees' decision at their meeting of March 11-12, 2010:

- The Basic rate is to decrease by 0.04% of pensionable salary for each of the member and the employer as part of the adjustment resulting from the discontinuation of the MSP premium subsidy in 2003 i.e. a total reduction of 0.08%.
- The first 0.10% of the Basic rate increase is to be applied to employer contribution rate, and the balance of the required rate increase is shared equally between members and employers.

The calculated required increase in the total contribution rate from its current level is 0.48%. After reflecting the planned 0.08% reduction in the current rate as described above, the required increase from this new level would be 0.56%. Taking into account the 0.10% increase for employers referred to above, the resulting required increase is 0.23% for members and 0.33% for employers. The net increase is thus 0.19% for members and 0.29% for employers, for a total increase of 0.48%.

Current and Required Contribution Rates

	Member	Employer	Total
Current Basic	8.12% ¹	8.12% ¹	16.24%
Adjustment for MSP premium subsidy discontinuation	(0.04%)	(0.04%)	(0.08%)
Plus new Basic	0.23%	0.33%	0.56%
Total Basic Rate	8.31%¹	8.41%¹	16.72%
Current IAA	1.09%	0.09%	1.18%
Remove carve-out for post retirement group benefits	0.00%	1.00%	1.00%
Increase effective September 1, 2009	0.25%	0.25%	0.50%
Adjustment for MSP premium subsidy discontinuation	0.04%	0.04%	0.08%
Total IAA Rate	1.38%	1.38%	2.76%
Total Required Contribution Rate	9.69%¹	9.79%¹	19.48%

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.

¹ Integrated, i.e. less 0.75% of salaries up to the YMPE.

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 4 - Accrued Benefits – Funded Ratio at August 31, 2009

Present Plan – Basic Account – Non-Indexed Benefits

	(\$000's)	
	2009	2006
Fund (Basic Account): smoothed value of assets	2,202,457	1,670,025
Accrued Liabilities		
▪ for pensions being paid	899,902	605,532
▪ for inactive members	167,263	122,575
▪ for active members	1,061,763	883,029
Total Accrued Liabilities	2,128,928	1,611,136
Surplus (Unfunded Actuarial Liability): accrued service only	73,529	58,889
Funded Ratio: Fund ÷ Total accrued liabilities	103%	104%

The above schedule indicates that the funded ratio for accrued benefits has deteriorated from about 104% to 103%. This is largely for reasons similar to the items in the analysis on page 15, but excluding those items related to future contribution rates.

7. Supplementary Funding Valuations

Results analogous to those in Schedules 1 through 4 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; 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. In the indexing calculations, we eliminated the 1% "carve out" from the employer contributions to the IAA that was allocated to the non-pension benefits in the last valuation. Also, the fully indexed funding valuation result takes into account IAA contributions of 1.38% from each of members and employers. As set out in Appendix A, this rate includes an increase of 0.04% each that is not effective until September 2010. We have ignored the impact of the delay in this contribution increase; the effect is not material.

The key results are summarized below:

(a) Indexed Benefits (no tax limits)

	Basic Only	Basic + Indexed
Funded position	(\$000's)	(\$000's)
Assets on current contribution basis	3,081,485	3,513,708
Liabilities	3,109,665	4,278,238
Surplus (Unfunded Liability) on current contribution basis	(28,180)	(764,530)
Surplus (Unfunded Liability) on entry age contribution basis	(4,115)	(552,536)
Contribution Rates (Integrated)	%	%
Member - current	8.12	9.50 ¹
Employer - current	8.12	9.50 ¹
Total - current	16.24	19.00
Entry-age normal cost	16.66	22.70
Amortization ²	0.06	6.59
Total - entry-age	16.72	29.29

If assets and liabilities are restricted to accrued service only, i.e. analogous to Schedule 4 earlier, the 2009 surplus (unfunded liability) figures change as follows:

	(\$000's)	
	Basic Only	Basic + Indexed
Assets	2,202,457	2,476,542
Liabilities	2,128,928	2,929,547
Surplus (Unfunded Liability)	73,529	(453,005)
Funded Ratio	103%	85%

¹ Includes the increases to the IAA effective September 1, 2009 and September 1, 2010.

² Basic amortization is as required by the PBSA, Basic + Indexed amortization is over 15 years.

(b) Benefits Limited to ITA Maximums

When the income tax limits on benefits are recognized, the above surpluses (unfunded liabilities) and normal cost rates change marginally to:

	Basic Only	Basic + Indexed
Surplus (Unfunded Liability)	(\$000's)	(\$000's)
Current Contribution Basis (i.e. Accrued + Future Service)	(21,349)	(755,245)
Entry Age Basis	(722)	(548,407)
Accrued Service Only	77,853	(447,151)
Contribution Rate	%	%
Entry Age Basis	16.60	22.61
Amortization ¹	0.01	6.54
Basic/Basic + Indexed Rate	16.61	29.15

8. 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 has been provided since January 1, 1982 under the present Plan terms, and for many years before that under earlier Plan provisions. As discussed earlier, the plan is moving to a sustainable indexing basis, whereby indexing is limited based on the financial position of the plan. 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

¹ Basic amortization is as required by the PBSA, Basic + Indexed amortization is over 15 years.

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.

The relevant results are summarised below:

Surplus (Unfunded Liability):	(\$000's)
▪ current contribution basis	(755,245)
▪ entry-age basis	(548,407)
Contribution Rates (integrated at 0.75%):	% of pay
▪ Current Member Rate ¹	9.50
▪ Current Employer Rate ¹	9.50
▪ Total Current Rate	19.00
▪ Combined member/employer entry-age normal cost	22.61
▪ 15 year amortization of fully indexed entry-age unfunded liability	6.54
▪ Fully indexed rate with 15 year amortization	29.15
▪ Total required member/employer rate	19.48²

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 19.48%.

¹ Including scheduled increases to the IAA, but excluding increases to the Basic Account arising from this report.

² The 19.48% recommended rate consists of 16.72% Basic (PBSA minimum), plus 1.38% (member IAA), plus 1.38% (employer IAA).

Under the *ITA*, 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 8.94% of salary up to the YMPE and 9.69% of salary above the YMPE exceeds this limit for majority of the members, so it is necessary to apply to the Minister for exemption. The employer contributions of 9.79% exceed the member contributions of 9.69% and therefore the requirement that the member contributions will not exceed ½ of the amount required to fund the aggregate benefits is met.

V. 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:

Long Term Funding Commitment	2009
Normal (entry-age) actuarial cost	16.66%
IAA contributions	2.76%
Long term funding commitment - excluding current amortization schedule	19.42%

The amortization requirement is 0.06% of salaries for 12 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 2009 sustainable indexing level to be 1.83% per year. This is a slight improvement from the equivalently calculated 2006 sustainable indexing level of 1.73%.

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:

	2009
	(\$000's)
Sustainable Indexing Target	1.83%
Assets	
Market Value of Fund	2,312,069
Asset Smoothing Adjustment	115,603
Smoothed Value of Fund	2,427,672
Actuarial present values of contributions at Entry Age Normal Cost ¹	992,718
Total Assets	3,420,390
Liabilities	3,564,586
Surplus (Unfunded Actuarial Liability)	(144,196)
Add value of <i>PBSA</i> basic amortization requirement 0.06% to 2021	4,066
Adjusted surplus	(140,130)
Contribution Requirements	%
Entry Age Normal Cost - based on sustainable indexing target	18.78
Amortization of adjusted surplus over infinite period	0.64
Required contribution	19.42
Long term contribution commitment	19.42

The above results show that, at an indexing rate of 1.83% per year, the required contribution rate is 19.42% 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.

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.

¹ This allows for indexing at 1.83% and reflects a 6.75% discount rate.

VI. Subsequent events

To the best of our knowledge, there are no material subsequent events, other than the amendments effective September 1, 2010 described in section II and Appendix A and which have been taken into account, that would affect the results and recommendations of this valuation.

VI. Actuarial opinion

In our opinion,

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

This report has been prepared and our opinions given in accordance with accepted actuarial practice. Pursuant to the *Act* and other regulatory requirements, the next valuation should be completed no later than as of August 31, 2012.

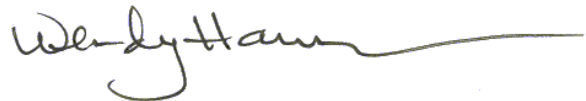
VII. Acknowledgement

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,



Richard A. Border
Fellow of the Institute of Actuaries
Fellow of the Canadian Institute
of Actuaries



Wendy F. Harrison
Fellow of the Society of Actuaries
Fellow of the Canadian Institute
of Actuaries

May 13, 2010

Appendix A

Summary of Plan and Amendments as at August 31, 2009

Changes to the Plan

The previous valuation was based on the provisions of the Plan as at August 31, 2006. Since then, the Plan has been amended a number of times. Certain amendments are only effective after the valuation date, but have been taken account in this valuation as they impact on the valuation results. The main changes are summarized below.

- effective April 1, 2007, sections 24 and 24.1 of the Regulation were repealed. Service accrued in another BC public sector plan can no longer be reinstated under the Interplan Pension Transfer Agreement, and service transferred to another BC public sector plan prior to July 1, 1973 can no longer be reinstated in the plan if a member subsequently becomes an active plan member again;
- effective July 1, 2007, section 74 of the Regulation, which deals with public sector remuneration after retirement, was repealed and replaced. The amended text clarifies that a retired member, who becomes an employee to whom the plan applies, may only opt to re-contribute to the plan within 60 days of the granting of their pension. If the member opts to re-contribute to the plan, the member must repay all pension amounts received;
- effective July 1, 2007, subsection 60(2.1) was added to the Regulation. The new subsection clarifies that members are not eligible to receive a disability pension if they accept a lump sum payout in lieu of continuing monthly income benefits under an approved group disability (LTD) plan;
- member and employer contribution rates were amended effective September 1, 2007. Member and employer contributions rates to the Basic Account were increased from 6.86% to 7.37% of earnings up to the YMPE and from 7.61% to 8.12% of earnings above the YMPE. The rate applied to the Inflation Adjustment Account (“IAA”) remained unchanged at 1.09% of the member’s entire salary for both members and employers;
- effective May 29, 2008, the definition of Latest Retirement Age in the Regulation was amended to reference the age set out in the *Income Tax Act Regulation*, which was increased from age 69 to 71;
- effective July 1, 2009, reinstatement provisions in sections 20 to 23 were repealed. Refunds taken from the plan can no longer be reinstated regardless of the type of refund or the service period of the refund;

- effective September 1, 2009, the member and employer contributions to the IAA increased by 0.25% of pensionable salary each, from 1.09% to 1.34% of pensionable salary each;
- effective September 1, 2009, the post-retirement group benefit subsidies were eliminated, removing the need for a “carve-out” of the gross IAA contributions from the employer;
- effective September 1, 2009 the 35 year limit on service accrual was removed.
- effective September 1, 2010, section 73 of the plan text, dealing with indexing, was amended such that indexing is to be limited to the lower of the increase in the consumer price index and a maximum amount recommended by the actuary, which is expected to be sustainable in the long term.

In addition to the above plan amendments, we were informed (per letter dated March 26, 2010) that the Board had approved three further amendments that will be incorporated into the plan rules effective September 1, 2010.

- effective September 1, 2010, member and employer Basic contribution rates will be decreased by 0.04% of pensionable salary each. This decrease will be applied concurrently with any adjustment to the Basic contribution rate resulting from this valuation;
- effective September 1, 2010, member and employer IAA contribution rates will be increased to by 0.04% of pensionable salary each, from 1.34% to 1.38% of pensionable salary;
- effective September 1, 2010, the employer contribution rate to the basic account will be 0.1% of pensionable salary higher than the member contribution rate.

The main provisions of the Plan taken into account in the valuation as at August 31, 2009 are summarized below. Except as otherwise noted, the section references are to the College Pension Plan Regulation, B.C. Reg. 95/2000.

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) 7.37% of that part of the member's cumulative salary that does not exceed the YMPE (paid into the Basic Account);
- (b) 8.12% 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).¹

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) 7.37% of that part of a member's cumulative salary that does not exceed the YMPE (paid into the Basic Account);
- (b) 8.12% 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).¹

¹ Member and employer contribution rates to the IAA increased to 1.34% effective September 1, 2009 and are scheduled to increase by a further 0.04% of pensionable salary effective September 1, 2010.

The subsidy of extended health and dental plan premiums under the College Plan Post Retirement Group Benefit Regulation was removed effective September 1, 2009. Prior to this removal, employer contributions to the IAA were reduced by amounts required to meet the cost of these non-pension benefits. The amount allocated to non-pension benefits was limited to 1% of pensionable salary annually.

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.

Section 12 of Schedule A to the *Public Sector Pension Plans Act* provides that the Plan funding must comply with the *PBSA* requirements for a going-concern valuation. Further, future contribution rate changes (up or down) 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, 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, 1966¹, 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 year's of pensionable service accrued on and after January 1, 1966¹.

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, 1966¹.

(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

¹ Prior to September 1, 2009, service was limited to 35 years.

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%.

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, calculated as though the member had retired immediately prior to death, with the pension reduced for early retirement as applicable and then converted to a 100% joint life and last survivor option; the bridge benefit is applied immediately.¹

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 effective².

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.)

In March 2009, the board agreed to amend section 73 such that:

- (a) Indexing granted effective January 1, 2010 was to be calculated as 100% of the change in the CPI from September 2008 to September 2009, provided this was positive and that there were sufficient funds in the IAA to meet the cost of the increase.
- (b) Thereafter, sustainable indexing was to be provided such that indexing will be the lesser of:
 - (i) the increase 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,
 - (ii) the maximum sustainable indexing rate,provided there are sufficient funds in the IAA to meet the cost of the increase.

¹ Effective January 1, 2010, if there is a surviving spouse, the spouse will receive an immediate pension equivalent in value to the commuted value of the regular pension earned to the date of death.

² For increases prior to December 31, 1980, the increase in the highest average salary is in accordance with changes in the pension index.

- (c) The maximum sustainable indexing rate will be recommended by the actuary every three years, as part of the triennial valuation.
- (d) 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);¹
 - (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:

¹ This was 1.09% at the last valuation, increased by 0.25% to 1.34% effective September 1, 2009 and by 0.04% effective 1.38% effective September 1, 2010.

- (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 Appendix A to the *Act* 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) \$2,444 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 \$2,444 limit will be automatically indexed each year.

Other Items

1. Prior to September 1, 2009, certain non-pension (i.e. group) benefits were provided to retired members. As of January 1, 2004, these post-retirement group benefits were set out in the College Pension Plan Post Retirement Group Benefits Regulation, B.C. Reg. 490/2003 (previously, they were defined in sections 91 through 95 of the Regulation). Benefits provided included dental and extended-health benefits; the cost of these 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 of 1.09%).

Previously, Medical Services Plan ("MSP") premiums were also included in the covered post retirement benefits, at a rate of 100% prior to March 1, 2003, and at 50% from March 1, 2003 to April 1, 2004. After April 1, 2004, MSP premiums are 100% paid by the member.

2. Section 9 of Schedule A to the *Act* 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.

Under the Public Sector Transfer Agreement (and the previous bilateral agreements), if the importing plan's benefits are more generous, the transferred service is pro-rated 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
Investment Return	6.5% p.a. (was 6.75%)	6.75%
General Salary Increases	3.75% p.a (was 4.0%)	3.50%
Seniority Salary Increases	Annual percentages varying by age and sex	Same
CPI Increases	3.00% (was 3.25%)	2.75%
Pension Indexing	<p>Future indexing of pensions and deferred pensions ignored, as will be covered by Inflation Adjustment Account</p> <p>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 (was 3.25%)</p> <p>Indexing to date is capitalized and forms part of pension liability</p>	<p>Future indexing of pensions and deferred pensions at "Sustainable Indexing Rate" – This rate is calculated and is the primary output of this valuation</p> <p>Future indexing (by inflation) of wage base for disability accruals assumed to be a charge to the Basic Account and to be 2.75% per annum</p> <p>Indexing to date is capitalized and forms part of pension liability</p>
Asset Values	<p>Assets carried at smoothed market values</p> <p>Smoothed value limited to 110% of Market Value</p>	<p>Assets carried at smoothed market values</p> <p>Smoothed value limited to 105% of Market Value</p>
Costing Method	<p>Contributions are based on an entry-age funding approach</p>	<p>Required contributions are based on an entry-age funding approach</p> <p>Contributions are set equal to the funding valuation basic normal cost plus IAA contributions.</p>

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

1. Actuarial Methods

The methodology used to calculate the valuation liabilities 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.

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

2. Treatment of Member and Pensioner Data

Data as of August 31, 2009 were prepared by the Pension Corporation for 11,699 active members, 3 members on leave of absence, 4,260 pensioners, 240 members receiving benefits from a long-term disability plan, 3,910 inactive members plus a further 9 non-retired individuals with very limited data, 2,816 active member terminations and 208 pensioner terminations during the period September 1, 2006 to August 31, 2009. 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, and also spot-checked individual items against the data recorded for the previous valuation. We also conducted a number of edits on the data to test for internal consistency and overall appropriateness for our valuation. 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 8% to reflect the part-time employment (a similar 8% adjustment was applied at the previous valuation).

The active member data included 1,947 persons who had no salary or service reported for the year ending August 31, 2009, or with a last-contribution-date prior to August 2009. We excluded them from the active member base, and have included them with the inactive data, holding a liability for 374 of them (those with at least 3 years of service and a refund balance of at least \$1,500) as if they would be reactivated on August 1, 2009 (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 refund balance for the remaining 1,573 persons.

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 3 persons who were recorded by the Pension Corporation as being on a leave of absence were transferred to the inactive data and treated as described below.

The liability for the 230 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 (maximum 35 years) 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). A similar approach was used in the previous valuation.

We divided the 3,913 inactive members (including 3 on leave of absence) into three classes:

- (i) those on leave of absence and whose accumulated accounts were at least \$1,500, or who have returned to work after the valuation date,
- (ii) of the remainder, those with missing, invalid or inconsistent detail, or whose accumulated accounts were less than \$1,500, or who were known to have taken a refund after the valuation date, and
- (iii) all other inactive members.

We calculated liabilities on the assumption that 100% of the first group would be reactivated on September 1, 2009 (with assumed average salaries equal to the average salaries for active members in the same age-sex category), and that 100% of the third group would receive vested pensions. The liability for the second group was held as twice their accumulated accounts.

In the previous valuation, we reactivated those currently working in the B.C. family of plans. In this valuation, the members currently working in the B.C. family of plans are treated as normal deferred vested members in this valuation because of the most members are now only eligible to transfer under the Public Sector Transfer Agreement, and the salary in the BC family of plans is thus no longer relevant to the amount to be transferred.

With respect to the 9 remaining non-retired members with limited data, we held a liability equal to twice their refund balances.

Of the total non-pensioner data there were 5 active members and 10 long-term disability members excluded from the valuation because of missing, invalid or inconsistent detail. Liabilities of twice their regular account balances were held for these members.

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
Pensioners	4,260	4,260					
Active Members	11,699		9,747			374	1,578
Long Term Disability	240			230			10
Terminated Vested	3,910				2,138		1,772
Leave of absence	3					3	
Limited data	9						9
Total membership	20,121	4,260	9,747	230	2,138	377	3,369

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:

- (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, 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 6.75% 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 6.75% 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 11.3% for 2007, 1.3% for 2008 and -5.0% for 2009. At August 31, 2009, approximately 55% of the total portfolio was invested in equities (including private placements), a further 14% in real estate, and the balance of 31% in fixed income.

(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.

As the sustainable indexing target is not guaranteed, and the primary objective of moving to a 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 6.75% investment return assumption used in the 2006 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 3.25% per annum. If we continue with the same real return component of 3.5% and apply it to the new 6.5% investment return assumption, we get a revised long-term underlying inflation assumption of 3.0% per annum (i.e. 6.5% - 3.5%). 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 2006 valuation was 4.0% per annum, comprising the (then) underlying inflation assumption of 3.25% per annum, plus a real salary increase component of 0.75% per annum.

For the Funding Valuation, when the real salary increase component of 0.75% per annum is added to the revised underlying inflation assumption of 3.0%, we get a revised general salary increase assumption of 3.75%.

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 2006 and 2009 annual investment return and general salary increase assumptions, and their underlying economic interrelationships, are summarized below.

	Funding Valuation		Sustainable Indexing Valuation	
	2009	2006	2009	2006
1. Investment return = excess investment return threshold	6.50%	6.75%	6.75%	n/a
2. Real return rate	3.50%	3.50%	4.00%	n/a
3. Implied underlying inflation = 1 - 2	3.00%	3.25%	2.75%	n/a
4. Real salary increase	0.75%	0.75%	0.75%	n/a
5. General salary increase = 3 + 4	3.75%	4.00%	3.50%	n/a

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

The 2009 valuation data indicates that average annual earnings increased by about 10.5% from mid-2006 to mid-2009 (i.e. about 3.39% per annum), as compared with an expected increase of about 12.5% (i.e. about 4.0% per annum) on the basis of the assumptions used in the 2006 valuation.

The input data salaries provided to us for this valuation were the actual earnings during fiscal 2009. 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 2010 level of \$47,200. In the previous valuation we assumed that the YMPE would increase at the rate of 4.0% per year from its 2007 level of \$43,700.

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, 2009, 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. 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. We have modified the approach used at the last valuation to ensure that the difference between the market value and the smoothed value does not become too large.

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

After discussion with the Board, it was agreed that it was appropriate to introduce 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.

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

Total Fund Smoothing

	2007	2008	2009
1. Aug-over-Aug increase in CPI	1.7%	3.5%	-0.8%
2. Base return = (1) + 3.5%	5.2%	7.0%	2.7%
Plan year-end asset values - \$000's			
3. At market value	2,358,945	2,418,958	2,312,069
4. At smoothed value	2,142,493	2,393,028	2,476,542
5. Ratio of (4) ÷ (3)	0.908	0.989	1.071
Annual returns			
6. At market value	11.3%	1.3%	-5.0%
7. At smoothed value	10.1%	10.2%	2.9%

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

Basic Account	2007	2008	2009
8. Market value	2,057,548	2,121,665	2,056,187
9. Smoothed value	1,868,752	2,098,922	2,202,457
10. Ratio of (9) ÷ (8)	0.908	0.989	1.071
Inflation Adjustment Account			
11. Market value	301,397	297,293	255,882
12. Smoothed value	273,741	294,106	274,085
13. Ratio of (12) ÷ (11)	0.908	0.989	1.071

(b) Sustainable Indexing Valuation Assets

As mentioned previously, a primary reason for moving to 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.

The August 31, 2009 total smoothed value of assets used for the Funding Valuation of \$2,476,542,000 is 107.1% of the market value of assets of \$2,312,069,000. Applying the 105% limit decreases the smoothed value of assets to \$2,427,672,000

Mortality

Because of limited mortality experience, we used the same basis as for the B. C. Teachers' Pension Plan valuation as at December 31, 2008, namely:

- (a) For active members we assumed 60% for males and 75% for females of the respective rates in the 1994 Group Annuity Mortality Table. The previous valuation used 65% for males and 80% for females of the respective rates in the 1994 Group Annuity Mortality Table.

- (b) For members retired on account of disability we used 80% for males and 85% 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). We used the same rates in the previous valuation.
- (c) For other retired members, the beneficiaries and spouses of former members, and for active members after retirement, we used 60% for males and 75% for females of the rates of the 1994 Group Annuity Mortality Table. In the previous valuation, we used 65% for males and 80% 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, 2006 to August 31, 2009 and compared this with the experience observed and the rates used for previous valuations. We made modest changes to the withdrawal rates used for the previous valuation, by adopting the following multiples of those rates.

Multiples applied to 2006 Rates

	In the first 3 years of service			After 3 years of service
	1 st year	2 nd year	3 rd year	
Males	100%	110%	110%	110%
Females	105%	105%	110%	110%

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. including death, disability and retirement)

Age at entry	2009 valuation			2006 valuation		
	1 st year	2 nd year	3 rd year	1 st year	2 nd year	3 rd year
Males						
20	.145	.109	.078	.145	.099	.071
30	.145	.109	.078	.145	.099	.071
40	.145	.109	.078	.145	.099	.071
50	.145	.109	.078	.145	.099	.071
Females						
20	.062	.077	.064	.059	.073	.058
30	.159	.160	.099	.151	.152	.090
40	.141	.097	.073	.134	.092	.066
50	.141	.097	.073	.134	.092	.066

B. Withdrawal Rates Applicable After 3 Years of Service

Attained age	Males		Females	
	2009 valuation	2006 valuation	2009 valuation	2006 valuation
23	.061	.055	.088	.080
33	.036	.033	.061	.055
43	.025	.023	.026	.024
53	.025	.023	.023	.021

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 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 age 63 assumption was made in the 2006 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.

Age	2009 valuation		2006 valuation	
	Males	Females	Males	Females
25	.0002	.0001	.0002	.0001
35	.0003	.0007	.0004	.0008
45	.0017	.0024	.0015	.0023
55	.0046	.0067	.0047	.0067

The rates used for this valuation are 105% for males and 105% for females of the respective rates used for the valuation of the Canadian Public Service Superannuation Plan as at March 31, 2005. The 2006 valuation used multiples of 70% for males and 75% for females applied to the rates used in the Canadian Public Service Superannuation Plan as at December 31, 1999.

Retirement

We examined the 2006-2009 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. We gave partial recognition to the observed experience by adopting modest changes to the rates previously used for retirement.

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

Age	Service	2009 valuation		2006 valuation	
		Males	Females	Males	Females
For unreduced retirement pensions					
55-59	35	.30	.30	.35	.35
60	10	.33	.32	.33	.30
61	10	.20	.24	.22	.26
62	10	.20	.24	.22	.26
63	10	.22	.26	.22	.26
64	10	.24	.30	.24	.28
65	0	1.00	1.00	1.00	1.00
For reduced early retirement					
55-59	at least 10 years, but age plus service add to less than 80	.06	.06	.08	.08
55-59	age plus service add to at least 80	.12	.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, 2009 and on the graduated average salaries of the active members as of August 31, 2009, 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:

Age	This (& Previous) Valuation	
	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 vested 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

As in the previous valuation, 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.

Expenses

Administration expenses are paid out of the College fund. These amounts totaled 0.39%, 0.42% and 0.40% of salaries during fiscal 2007, 2008 and 2009 respectively. An expense provision to 0.45% of payroll was used in the previous valuation, as part of the normal actuarial costs in the determination of the required contribution rates under the entry-age funding method. We have continued with the same expense provision of 0.45% of payroll for this valuation. This provision represents the average expected 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 approach 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 on the presumption that these are implicitly included in the long-term investment return assumption, which is assumed to be net of such charges.

Other items

- (1) 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).
- (2) **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".

Schedule A of the Public Sector Pension Plans Act, 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 \$2,476,542,000;
- 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 contribution rate of $8.12\% + 1.38\% = 9.5\%$, with a 0.75% integration for CPP (i.e. reduced by 0.75% of salaries below the YMPE) for both employer and member. 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) \$2,444 in 2009 (\$2,494 in 2010) 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 \$2,444 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 \$2,494 limit is automatically indexed each year after 2010 in accordance with increases in the average wage. Accordingly, we have applied a 3.75% per annum increase to the \$2,494 limit after 2010. (At the previous valuation the corresponding dollar limit was \$2,111, and was scheduled increase to \$2,222 in 2007, \$2,333 in 2008, \$2,444 in 2009, and after 2009 was assumed to increase by the average wage increase of 4.0%.)

It should also be noted that, in the tax-limited results, we valued the existing pensions in payment, and the deferred vested pensions, in full, as provided to us, i.e. we were unable to carve out any "excess" portions.

Appendix C

Active Member Data

Age group ¹	Active members August 31, 2009 ²			New entrants Sep-1-04 to Aug-31-09 and still active Aug-31-09	
	Number	Average annual earnings ³ \$	Average service (years)	Number	Average annual earnings ³ \$
Males					
20-24	7	59,935	0.0	13	59,031
25-29	41	62,285	1.0	80	64,338
30-34	198	65,239	1.9	215	66,183
35-39	353	68,628	3.0	297	67,008
40-44	598	73,010	4.4	364	70,767
45-49	811	76,411	6.9	312	70,234
50-54	895	78,789	8.6	296	74,376
55-59	867	82,579	11.6	197	76,462
60 & over	753	83,416	13.2	118	76,042
Total	4,523	77,530	8.3	1,892	70,702
Females					
20-24	7	44,959	0.6	11	52,241
25-29	92	59,053	0.9	177	60,533
30-34	331	63,489	1.9	365	64,618
35-39	550	67,003	3.0	425	64,715
40-44	750	70,462	4.6	399	66,612
45-49	933	73,533	6.3	372	67,959
50-54	1,049	76,570	8.8	330	69,619
55-59	925	77,791	11.4	158	69,767
60 & over	587	79,466	12.5	84	68,440
Total	5,224	73,505	7.4	2,321	66,344
Total males & females	9,747	75,373	7.8	4,213	68,301

¹ Age nearest birthday at August 31, 2009 for actives and at entry for new entrants.

² 5 actives excluded because of invalid data; 1,947 actives reclassified as inactive data.

³ Actual earnings in fiscal 2009 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.

A comparison of the August 31, 2009 active membership with the August 31, 2006 active membership is as follows:

	Aug. 31, 2006	Aug. 31, 2009	Change 2006 to 2009
Males			
- Number	4,377	4,523	+ 3.3%
- Proportion of total	46.6%	46.4%	- 0.2%
- Average age (at 8.31)	49.7	50.2	+ 0.5 years
- Average service	8.3	8.3	unchanged
- Average salary	\$70,372	\$77,530	+ 10.2%
Females			
- Number	5,018	5,224	+ 4.1%
- Proportion of total	53.4%	53.6%	+ 0.2%
- Average age (at 8.31)	47.6	48.4	+ 0.8 years
- Average service	7.1	7.4	+ 0.3 years
- Average salary	\$66,271	\$73,505	+ 10.9%

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, 2009 with that used at August 31, 2006 in determining the entry-age normal costs, is as follows:

	Aug. 31, 2006	Aug. 31, 2009	Change 2006 to 2009
Males			
- Number	1,851	1,892	+ 2.2%
- Proportion of total	44.1%	44.9%	+ 0.8%
- Average age at entry	43.8	44.5	+ 0.7 years
- Average salary	\$63,693	\$70,702	+ 11.0%
Females			
- Number	2,344	2,321	- 1.0%
- Proportion of total	55.9%	55.1%	- 0.8%
- Average age at entry	41.9	42.3	+ 0.4 years
- Average salary	\$60,213	\$66,344	+ 10.2%

The number of new entrants in the five year period preceding the valuation date has increased for males and decreased for females. The average age of new entrants has increased slightly since 2006. The average salary increases for male entrants are higher than the average salary increases for male actives, but lower for females.

Appendix D

Inactive Member Data

1. Inactive Members Assumed Reactivated on Valuation Date

Age group ¹	Males			Females		
	Number	Average annual earnings ²	Average service (years)	Number	Average annual earnings ²	Average service (years)
30-34	6	\$66,191	1.9	6	\$63,487	3.3
35-39	9	68,979	2.9	24	67,116	3.6
40-44	11	73,768	5.0	36	69,859	4.2
45-49	26	76,741	5.0	50	73,631	4.1
50-54	35	79,006	4.7	45	76,462	5.0
55-59	33	82,587	8.0	37	77,721	3.7
60 & over	34	83,345	8.9	25	78,158	8.6
Total	154	78,889	6.2	223	73,805	4.7

	Number	Average annual earnings ²	Average service
Total males & females	377	\$75,882	5.3 years

2. Members on Long-Term Disability

Age group ¹	Males			Females		
	Number	Average annual earnings ²	Average service (years)	Number	Average annual earnings ²	Average service (years)
30-34	-	-	-	1	\$68,125	5.0
35-39	1	\$69,189	2.1	3	59,614	3.5
40-44	2	64,135	5.8	11	63,001	5.7
45-49	3	69,676	8.8	14	72,576	10.8
50-54	10	76,716	12.1	25	71,454	12.6
55-59	27	76,974	16.8	55	73,312	17.2
60 & over	37	78,838	19.1	41	75,094	18.3
Total	80	77,112	16.5	150	72,356	14.9

¹ Age nearest birthday at August 31, 2009.

² Assumed same earnings as for active members in same age-sex group.

3. Other Inactive Members Assumed Electing Vested Pensions

Age group ¹	Males			Females		
	Average annual vested pensions			Average annual vested pensions		
	Number	Initial ²	Offset at age 65	Number	Initial ²	Offset at age 65
25-29	4	\$ 911	\$124	6	\$1,076	\$136
30-34	20	1,485	182	41	1,949	232
35-39	61	2,964	309	100	2,630	317
40-44	96	3,736	417	160	3,475	402
45-49	183	5,629	562	228	4,756	560
50-54	236	8,031	814	295	7,030	757
55-59	217	6,820	751	232	6,820	827
60 & over	136	4,066	587	123	4,012	551
Total	953	5,804	631	1,185	5,181	605

4. Remaining Inactive Members

Number ³	Member contributions with interest
3,369	\$3,622,308

¹ Age nearest birthday at August 31, 2009.

² 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.

³ Includes 5 active and 10 disabled members, with invalid data.

Appendix E

Pensioner Data as of August 31, 2009

1. Former Contributors

Age group ¹	Number of pensioners ²	Annual Pensions (\$000's) ³				
		Single life	Joint life & survivor	Joint life & survivor with guarantee	Single life with guarantee	Temporary life
Male pensioners						
Less than 50	0	-	-	-	-	-
50-54	1	-	-	2	-	-
55-59	115	-	-	1,237	759	498
60-64	480	354	1,368	5,068	4,262	2,022
65-69	736	1,478	4,553	4,620	5,864	238
70-74	418	2,033	3,831	660	1,713	-
75-79	267	1,686	1,877	-	265	-
80-84	156	976	882	-	15	-
85-89	72	471	289	-	-	-
90 & over	9	51	32	-	-	-
Total	2,254	7,049	12,832	11,587	12,878	2,758
Female pensioners						
Less than 50	1	-	-	-	4	-
50-54	3	-	-	-	20	1
55-59	181	-	1	1,175	1,934	641
60-64	504	617	402	2,699	6,314	1,943
65-69	508	2,274	1,002	1,583	5,193	221
70-74	215	1,674	515	92	977	-
75-79	136	1,220	195	19	90	-
80-84	78	742	46	-	1	-
85-89	37	373	27	-	-	-
90 & over	11	73	-	-	-	-
Total	1,674	6,973	2,188	5,568	14,533	2,806
Grand Total	3,928	14,022	15,020	17,155	27,411	5,564

¹ Age nearest birthday at August 31, 2009.

² These numbers include only those who were formerly contributors to the plan.

³ Including supplements to January 1, 2009.

2. Beneficiaries

Age group ¹	Number of beneficiaries ²	Annual Pensions (\$000's) ³	
		Single life	Temporary life
Male beneficiaries			
Less than 50	1	20	-
50-54	0	-	-
55-59	3	20	-
60-64	4	30	-
65-69	2	52	-
70-74	9	100	-
75-79	4	41	-
80-84	1	13	-
85-89	0	-	-
90 & over	0	-	-
Total	24	276	-
Female beneficiaries			
Less than 50	2	27	-
50-54	6	48	-
55-59	10	132	-
60-64	15	195	-
65-69	31	504	-
70-74	41	599	-
75-79	30	271	-
80-84	45	464	-
85-89	35	419	-
90 & over	15	255	-
Total	230	2,914	-
Remaining guarantees	78 ⁴	1,222	-
Grand Total	332	4,412	-

¹ Age nearest birthday at August 31, 2009.

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

³ Including supplements to January 1, 2009.

⁴ Including four beneficiaries 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.

	2009	2006
Normal ("entry-age") actuarial cost portion	%	%
- males	16.48	15.90
- females	16.81	16.34
- combined	16.66	16.15
- YMPE integration	0.75 x 2	0.75 x 2

The change in the normal actuarial cost from 2006 to 2009 can be traced as follows:

	Males %	Females %	Combined %
▪ normal cost 2006 (below/above YMPE) (integration @ 0.75% x 2)	14.40 / 15.90	14.84 / 16.34	14.65 / 16.15
▪ data changes	0.08	(0.01)	0.03
▪ removing 35 years service cap	0.01	0.00	0.00
▪ 2007 increase in contribution rate	0.01	0.01	0.00
▪ assumption changes			
- investment return/salary increase	0.42	0.44	0.43
- retirement rates	(0.04)	(0.02)	(0.03)
- pre-retirement mortality	0.00	0.00	0.01
- post-retirement mortality	0.15	0.11	0.13
- withdrawal rates	(0.05)	(0.06)	(0.06)
sub-total	0.48	0.47	0.48
▪ total change	0.58	0.47	0.51
▪ normal cost 2009 (below/above YMPE) (integration @ 0.75% x 2)	14.98 / 16.48	15.31 / 16.81	15.16 / 16.66

	2009	2006
A. Normal ("entry-age") actuarial cost	16.66%	16.15%
B. Unfunded actuarial liability on entry-age basis (\$000s)	(4,115)	(5,828)
C. Present value of existing amortization requirements (\$000s)		
(i) 0.08% to 2021	5,553	n/a
D. Present value of existing amortization in excess of unfunded liability (= B + C)	1,438	n/a
	%	%
E. Reduction of existing amortization	(0.02)	n/a
F. Total PBSA amortization requirement		
(i) to 2021	0.08	0.08
(ii) existing amortization reduction	(0.02)	n/a
Total	0.06	0.08
G. Total PBSA required contribution rate		
- members	8.31	8.12
- employers	8.41	8.12
	16.72	16.24

The percentages are applied to members' total earnings and are reduced for the amount below the YMPE. For both 2006 and 2009, 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 Funding Valuation Results on Fully Indexed Basis, and with Income Tax Limits

The results herein are analogous to those contained in Schedules 1 through 5 in the body of the report. For ease of comparison, we have repeated the 2009 Basic Account results; selected 2006 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 – Statement of Actuarial Position as at August 31, 2009

Current Contributions – (\$000's)

	No Tax Limits		With Tax Limits	
	Basic only	Basic + Indexed	Basic only	Basic + Indexed
Assets				
Market Value of Fund	2,056,187	2,312,069	2,056,187	2,312,069
Asset smoothing adjustment	146,270	164,473	146,270	164,473
Smoothed value of Fund	2,202,457	2,476,542	2,202,457	2,476,542
Actuarial present values of				
▪ future member contributions	439,514	518,583	439,514	518,583
▪ future employer contributions	439,514	518,583	439,514	518,583
Total Assets	3,081,485	3,513,708	3,081,485	3,513,708
Liabilities				
Actuarial present values for				
▪ pensions being paid	899,902	1,197,415	899,902	1,197,415
▪ inactive members	167,263	264,197	167,230	264,154
▪ active members	2,016,717	2,790,843	2,009,919	2,781,601
▪ future expenses	25,783	25,783	25,783	25,783
Total Liabilities	3,109,665	4,278,238	3,102,834	4,268,953
Surplus (Unfunded Actuarial Liability)	(28,180)	(764,530)	(21,349)	(755,245)
Selected 2006 Comparisons				
Total Assets	2,409,479	2,715,945	2,409,479	2,715,945
Total Liabilities	2,463,362	3,449,548	2,456,821	3,440,465
Surplus (Unfunded Actuarial Liability)	(53,883)	(733,603)	(47,342)	(724,520)

Schedule G2 – Develop Surplus (Unfunded Actuarial Liability) on Entry Age Basis

Present Plan – August 31, 2009 – (\$000's)

	No Tax Limits		With Tax Limits	
	Basic only	Basic + Indexed	Basic only	Basic + Indexed
(a) Surplus (unfunded liability) on current contribution basis	(28,180)	(764,530)	(21,349)	(755,245)
(b) Present value of future contributions at:				
(i) entry-age rates	903,093	1,249,160	899,655	1,244,004
(ii) current rates	879,028	1,037,166	879,028	1,037,166
(iii) = (i) - (ii)	24,065	211,994	20,627	206,838
(c) Surplus (unfunded liability) on entry-age basis, = (a) + (b)	(4,115)	(552,536)	(722)	(548,407)
(d) Present value of existing amortization requirements – 0.08% to 2021	5,553	n/a	5,553	n/a
(e) Present value of existing amortization in excess of unfunded liability = (c) + (d)	1,438	(552,536)	4,831	(548,407)
Selected 2006 Comparisons				
Surplus (unfunded liability)				
- on current contribution basis	(53,883)	(733,603)	(47,342)	(724,520)
- on entry-age basis	(5,828)	(424,092)	(1,354)	(417,592)

Schedule G3 – Current and Required Contribution Rates – August 31, 2009

	No Tax Limits		With Tax Limits	
	Basic only %	Basic + Indexed %	Basic only %	Basic + Indexed %
Current contribution rates^{1, 2, 3}				
Member	8.12	9.50	8.12	9.50
Employer	8.12	9.50	8.12	9.50
Combined member/employer	16.24	19.00	16.24	19.00
Required contribution rates				
Entry-age normal cost rate ¹	16.66	22.70	16.60	22.61
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
Total required contribution rate¹				
- 25 year amortization	16.69	27.16	16.61	27.03
- 15 year amortization	16.71	29.29	16.61	29.15
PBSA minimum rate ¹	16.72	n/a	n/a	n/a
Selected 2006 Comparisons^{2, 3}				
Member rate	7.61	8.70	7.61	8.70
Employer rate	7.61	7.70	7.61	7.70
Combined member/employer rates	15.22	16.40	15.22	16.40
Normal cost rate ⁴	16.15	22.39	16.11	22.34
Amortization of UAL (surplus)				
- 25 year amortization	0.05	3.92	0.01	3.86
- 15 year amortization	0.08	5.81	0.02	5.72

¹ Less 0.75% of salary up to the YMPE (for each of the members and the employers)

² Current basic contribution rates were effective September 1, 2007; previously lower rates were payable (7.61% for both members and employers to 8.31.07).

³ Current IAA contribution rates of 1.38% for both members and employers including 0.04% increase for both members and employers effective September 1, 2010. The 1% employer IAA contribution carved-out for group benefit was removed effective September 1, 2009. There was an IAA contribution rate increase of 0.25% for both members and employers effective September 1, 2009.

⁴ Less 1.5% of salary up to the YMPE (for each of the members and the employers).

Schedule G4 – Accrued Liabilities and Funded Ratio

Present Plan – August 31, 2009 – (\$000's)

	No Tax Limits		With Tax Limits	
	Basic only	Basic + Indexed	Basic only	Basic + Indexed
Fund				
▪ smoothed value	2,202,457	2,476,542	2,202,457	2,476,542
Accrued Liabilities				
▪ for pensions being paid	899,902	1,197,415	899,902	1,197,415
▪ for inactive members	167,263	264,197	167,230	264,154
▪ for active members	1,061,763	1,467,935	1,057,472	1,462,124
Total Accrued Liabilities	2,128,928	2,929,547	2,124,604	2,923,693
Surplus (Unfunded Actuarial Liability)				
▪ for accrued service only	73,529	(453,005)	77,853	(447,151)
Funded Ratio				
Fund ÷ Total accrued liabilities	103.5%	84.5%	103.7%	84.7%
Selected 2006 Comparisons				
Assets	1,670,025	1,915,518	1,670,025	1,915,518
Total Liabilities	1,611,136	2,254,952	1,606,321	2,248,264
Surplus (Unfunded Actuarial Liability)	58,889	(339,434)	63,704	(332,746)
Funded Ratio	103.7%	(84.9%)	104.0%	(85.2%)