Office of the Superintendent
of Financial Institutions

Bureau du surintendant
des institutions financières

ACTUARIAL REPORT

as at 31 March 1997

Benefit Plan

financed through the

Royal Canadian Mounted Police (Dependants) Pension Fund

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I- Overview

The benefit plan associated with the Royal Canadian Mounted Police (Dependants) Pension Fund was established in 1934 and amended several times thereafter, as described in the plan history given by Appendix 1. In 1959 the governing legislation was moved from the *Royal Canadian Mounted Police Act* to Part IV of the *Royal Canadian Mounted Police Pension Continuation Act* (PCA), where it remains.

The financial soundness of the plan rests on the balance in the Fund, which forms part of the public debt of Canada. The plan is not funded through investment in marketable securities. Indeed, the plan's assets are borrowed by the government.

A- Raison d'être of this Actuarial Report

This actuarial review of the benefit plan was made as at 31 March 1997 pursuant to section 56 of the PCA. The previous review was made as at 31 March 1994. The date of the next periodic review is 31 March 2001 because the valuation cycle has been lengthened to four years, which is permissible under the PCA.

In accordance with accepted actuarial practice and the PCA, the main purposes of this actuarial report are:

- to show a reasonable and realistic estimate of the balance sheet (i.e. assets, liabilities, and surplus) of the benefit plan as at the valuation date, and
- to recommend measures to deal with the surplus.

B- Main Findings

1. As at 31 March 1997 (i.e. the end of the 1997 plan year[1]), the plan had a surplus of $8.6 million, being the excess of assets of $27.66 million over liabilities of $19.04 million.

2. Some $2.7 million of surplus should be used to provide the following benefit improvements:

    - a 9% pension increase effective 1 April 1998 for current and prospective widows and children, with a further 9% increase effective 1 April 1999;

[1] Any reference to a given *plan year* in this report should be taken as the 12-month period ending 31 March of the given year.

- a 3% increase effective 1 April 1998 in the lump sum benefit payable upon the death of a member, with a further 2.9% increase effective 1 April 1999; and
- an increased residual amount payable on the death of a widow of a member who dies in the 1999 or 2000 plan years, to be obtained by deeming the member's contributions to be increased by 745% and 821%, respectively.

The remaining $5.9 million of surplus should be retained in the Fund to provide for benefit improvements in each subsequent year in accordance with the established methodology.

C- Recent Developments

During the intervaluation period there were no changes to the plan provisions, which are summarized in Appendix 2. However, the Governor in Council made benefit improvements in accordance with the surplus distribution recommendations in the 1994 actuarial report on the plan. The major improvements were effective pension increases of 9.0% as at 1 April 1995, 8.3% as at 1 April 1996, and 7.6% as at 1 April 1997. There were also increases in the lump sum death benefit payable on the death of a member and in the residual amount payable on the early death of a widow.

D- Future of the Plan

Although the plan membership has been declining steadily since 1948, the Fund itself has grown each year because interest credits have exceeded pension payments. In Section V-D it is estimated that this upward trend will continue for another six years. Thereafter the Fund will decline steadily until the last dollar is paid to the last widow, estimated to occur in the plan year 2039.

II- Data

A- Asset Data

1. Reconciliation of Balances in the Fund

				(in thousands of dollars)
Fund balance as at 31 March 1994				23,951
Plan year	1995	1996	1997	1995-97
Public Accounts opening balance	23,951	25,212	26,319	23,951
INCOME				
Instalment payments	16	15	15	46
Investment earnings	2,454	2,566	2,625	7,645
Subtotal	2,470	2,581	2,640	7,691
EXPENDITURES				
Survivor pension benefits	1,188	1,309	1,386	3,883
Unmarried member death benefits	0	165	0	165
Widow death benefits	9	0	0	9
Withdrawal benefits	12	0	0	12
Subtotal	1,209	1,474	1,386	4,069
Public Accounts closing balance	25,212	26,319	27,573	27,573
Fund balance as at 31 March 1997			27,573	27,573

The above table shows the reconciliation of the Fund from the previous valuation date to the current valuation date. Since the previous report's date, the Account balance has grown by $3,622,000 (i.e. a 15.1% increase) to reach $27,573,000 as at 31 March 1997.

2. Rates of Return

The following rates of return on the Fund in each of the last three plan years were calculated, using the foregoing entries, on the assumption that all transactions other than investment earnings occurred at the midpoint of the plan year:

1995	1996	1997
10.54%	10.45%	10.25%

3. Membership Data

In this report, *member* means a former contributor whose contributions remain in the Fund and *widow* means a widow whose pension is payable from the Fund.

There were no female constables when the Fund was open to new entrants; it follows that all current members are males and that all surviving spouses are widows.

The following table derived from the basic data reconciles the numbers of members and widows as at 31 March 1997 with the numbers shown in the previous report.

	Members	Widows
At 31 March 1994	250	173
Data corrections	(1)	0
Withdrawal	(3)	-
Deaths	(22)	(25)
New survivors	-	18
At 31 March 1997	224	166

4. Sources of Data

The Fund entries shown in item 1 above were taken from the financial statements prepared in respect of the plan by the Office of the Auditor General.

The RCMP Services Section of Public Works and Government Services Canada supplied the data on the status and benefit amounts of the members and widows. After a review for consistency and general reasonableness, it was concluded that the data were very accurate. The Section deserves to be acknowledged for its co-operation and able assistance.

III- Methodology

A- Assets

The principal asset of the plan consists of the recorded balance in the Royal Canadian Mounted Police (Dependants) Pension Fund, which forms part of the Public Accounts of Canada. This balance is equal to the book value of the portfolio of long-term bonds considered to be held by the Fund, as described in Appendix 2. For consistency, the liabilities are discounted at assumed interest rates, described in Section IV-A, that fully reflect the earning power of the assets.

The only other asset consists of the value, discounted in accordance with the projected Fund yields described in Section C below and shown in Section IV-A, of all future instalment payments by members in respect of past service elections made by 31 March 1978, which is when the last plan member retired from active duty.

B- Liabilities

1. Members

The plan’s liabilities in respect of the members as at the valuation date correspond to the value, discounted in accordance with the projected Fund yields described in section C below and shown in Section IV-A, of all future benefits accrued as at that date in respect of service as an active member of the Force. The cumulative dividend was assumed to be fixed at 675% for pensions and at 400% for lump sums payable on member deaths.

2. Widows

Consistent with accepted actuarial practice and standards, the plan’s liabilities in respect of the widows as at the valuation date correspond to the value, discounted in accordance with the projected Fund yields described in section C below and shown in Section IV-A, of all future benefits to which those widows are entitled. The cumulative dividend was assumed to be fixed at 675%.

3. Provision for Adverse Mortality Deviation

A best-estimate mortality assumption is useful in projecting the mortality experience of a sufficiently large group of insureds or pensioners. As the group size diminishes, random fluctuations play a larger role in mortality experience. Therefore the best-estimate mortality assumption used in this valuation is not necessarily a good indicator of the future mortality experience of the relatively small number of members and widows remaining in the plan.

Accordingly an additional liability has been set up to absorb the financial impact of random adverse mortality deviations. The amount of this liability was determined so that there is only a 5% chance of future mortality being so adverse that the entire provision will be needed. The dollar amount of the provision will decrease gradually with each successive valuation but its relative amount (i.e. expressed as a proportion of liabilities) will increase.

C- Projected Yields on the Fund

The government applies the same quarterly interest rates to the Fund as it does to the three major Superannuation Accounts (Public Service, Canadian Forces, and Royal Canadian Mounted Police). The projected yields (shown in Section IV-A) assumed in computing the present value of benefits involved in estimating the liabilities are the projected annual yields on the combined book value of the three accounts, all increased by 0.08% per annum. The increase recognizes that the practice of applying the quarterly interest rate to the beginning principal rather than the average principal during the quarter is advantageous to the Fund because its net cash outflows are proportionately much greater than those of the three accounts. In previous reports, the extra yield on the Fund was not recognized. The effect of recognizing it is shown in Section V-C in the reconciliation of surplus.

The projected yields were determined by an iterative process involving the actual investment earnings on the combined assets of the three accounts as at the valuation date, the assumed future new money interest rates (also shown in Section IV-A), and the assumed future combined cash flows (including those in respect of future new entrants) for the three accounts. This open-group approach is in accordance with the plan provision, common to the three pension plans, stipulating that the average yield on the combined accounts is to be used in allocating aggregate investment earnings to each of the three accounts.

IV- Assumptions

A- Interest Assumptions

The interest assumptions for this valuation are summarized in the table below. They are taken from the actuarial report as at 31 March 1996 on the pension plan for the Royal Canadian Mounted Police, except that the projected yield has been increased by 0.08% per annum, per Section III-C.

Plan Year	Projected Yield on Fund	New Money Rate
1998	10.05 %	7.2%
1999	9.81	6.8
2000	9.55	6.5
2001	9.24	6.2
2002	8.89	6.0
2003	8.49	6.0
2004	8.22	6.0
2005	7.97	6.0
2006	7.73	6.0
2007	7.54	6.0
2008	7.38	6.0
2009	7.21	6.0
2010	7.05	6.0
2011	6.89	6.0
2012	6.65	6.0
2013	6.53	6.0
2014	6.44	6.0
2015	6.36	6.0
2016	6.26	6.0
2017	6.19	6.0
2018	6.15	6.0
2019	6.12	6.0
2020	6.10	6.0
Ultimate	6.08	6.0

B- Margins Against Adverse Fluctuations

If the future experience proves less favourable than the best-estimate assumptions used in this valuation, two safety margins are available to offset the resulting losses. Firstly, the annual benefit increases arising from the large surplus could be curtailed if future yields on the Fund were less than expected. Secondly, there is a 95% probability of the provision for adverse mortality deviation being large enough to cover the entire loss arising from unfavourable future mortality experience. There being no other significant risks to the plan's solvency, the probability of a future benefit decrease is rather small.

C- Demographic Assumptions

Except where otherwise noted, all demographic assumptions were determined from the plan's own experience. Assumptions of the previous valuation were updated to reflect the experience of April 1994 to March 1997.

1. **New Entrants**

   Because the Fund has been closed to new entrants since 1959, the assumption that there would be no future new entrants was retained from the previous valuation.

2. **Members**

   Appendix 5 shows the assumed rates of mortality applicable to members in the 1998 plan year; up to age 90, the rates are as much as 10% lower than those assumed for that plan year in the previous valuation. The mortality rates for subsequent plan years were obtained by applying the accompanying annual reduction factors (all noticeably higher than the corresponding factors in the previous valuation) to the 1998 mortality rates.

   In this valuation each member was assumed to be subject to a withdrawal rate of 0.25% per annum, per Appendix 6. No withdrawals from the plan were assumed in previous valuations.

3. **Widows**

   Appendix 7 shows the rates of mortality assumed applicable to widows in the 1998 plan year; up to age 95, the rates are generally close to those assumed for that plan year in the previous valuation. The mortality rates for subsequent plan years were obtained by applying the accompanying annual reduction factors (all noticeably lower than the corresponding factors in the previous valuation) to the 1998 mortality rates.

4. **Prospective Widows**
Appendix 8 shows the proportion of members assumed to leave, upon death, a widow eligible for a pension from the Fund; up to age 95, the proportions are marginally higher than those assumed in the previous valuation. Also shown is the assumed age difference between spouses, which at most ages beyond 80 years is one year greater than assumed in the previous valuation.

5. **Eligible Children**
The assumption that no member would be survived by a child or student eligible to receive an annuity was retained from the previous valuation.

D- Other Assumptions

1. **Child Annuity in Course of Payment**
Although there was one child annuity in course of payment at the valuation date, it was ignored in this valuation. This simplification caused a trivial understatement of the actuarial liability.

2. **Late Reporting of Deaths**
The data reflect only those member and widow deaths up to 31 March 1997 that were reported by 8 April 1997. Any member death reported subsequently would cause a loss that was assumed to be offset by a gain on a late-reported widow death. The reporting lag was therefore ignored when determining the actuarial liability.

3. **Administrative Expenses**
For this valuation, the expenses incurred for the administration of the plan were ignored. These expenses, which are not charged against the Fund, are borne entirely by the government and are commingled with all other government expenses.

V- Results

A- Balance Sheet as at 31 March 1997

The following balance sheet is based on the plan provisions described in Appendix 2, the cumulative dividend in effect as of 1 April 1997 (675% for all benefits except lump sums payable on member deaths, for which it is 400%), and the data and actuarial assumptions described in previous sections.

Assets

Fund balance		$27,573,000
Actuarial present value of instalments in pay by members		89,000
Total assets		$27,662,000

Liabilities

Benefits accrued by members		
• widow pensions	$5,542,000	
• lump sums on death without a widow	2,284,000	
• lump sums on withdrawal	19,000	
		7,845,000
Widow pensions in pay		10,296,000
Provision for adverse mortality deviation		899,000
Total liabilities		$19,040,000

Surplus		$ 8,622,000

B- Sensitivity of Liabilities to Variations in Key Assumptions

The supplementary estimates shown below indicate the degree to which the liabilities of $19,040,000 shown in the balance sheet depend on some of the key assumptions. The liability changes shown below can also serve as a basis for approximating the effect of other numerical variations in a key assumption, to the extent that such effects as indeed linear.

1. Investment Yields

The valuation reflects a deemed investment policy of buying and holding long-term Government of Canada bonds. If the investment portfolio also included a significant equity component, it would be appropriate to project higher rates of return. As a measure of sensitivity, an increment of one percentage point in the projected yields (e.g. from 6.08% to 7.08% ultimately) would decrease the plan liabilities by $1,442,000 (i.e. by 7.6%).

2. Mortality of Members

If the mortality rates assumed for members in each future year were reduced by one-tenth, then the plan liabilities would decrease by $394,000 (i.e. by 2.1%).

If the assumed improvements in longevity for members after the 1998 plan year (see Appendix 5) were disregarded, then the plan liabilities would increase by $251,000 (i.e. by 1.3%).

3. Mortality of Widows

If the mortality rates assumed for widows in each future year were reduced by one-tenth, then the plan liabilities would increase by $521,000 (i.e. by 2.7%).

If the assumed improvements in longevity for widows after the 1998 plan year (see Appendix 7) were disregarded, then the plan liabilities would decrease by $306,000 (i.e. by 1.6%).

C- Reconciliation of Results with Previous Report

This subsection describes the various factors reconciling the surplus of this valuation with the corresponding items of the previous valuation. Figures in brackets indicate negative amounts. The main items in the table below are explained in the following pages.

Surplus as at 31 March 1994		$8,826,000
Cost of 1995, 1996, and 1997 benefit increases		(3,119,000)
Data and other corrections		38,000
Restated surplus as at 31 March 1994		$5,745,000
Interest on restated surplus		1,943,000
Provision for adverse mortality deviation		(899,000)
Experience gains and losses		
Mortality of members	$384,000	
Mortality of widows	323,000	
Investment income	171,000	
Withdrawals	76,000	
Age of new widows	(32,000)	
Proportion married	(1,000)	
Miscellaneous	64,000	
		985,000
Change in actuarial assumptions		
Interest rates	$419,000	
Mortality of members	317,000	
Withdrawals	139,000	
Mortality of widows	116,000	
Age of new widows	(84,000)	
Proportion married	(2,000)	
		905,000
Refinements of valuation program		(57,000)
Surplus as at 31 March 1997		$8,622,000

Explanations of the Above Reconciliation

1. **Provision for Adverse Mortality Deviation**
   Beginning with this valuation, an additional liability is being held as a margin against adverse mortality deviation. The amount thereof ($899,000) is a material charge to surplus in this valuation; however, some or all of it will eventually be returned to surplus unless future mortality experience is very unfavourable (see discussion in Section III-B).

2. **Mortality of Members**
   During the three-year period ended 31 March 1997, the 22 reported member deaths amounted to only 71% of the 31.2 expected deaths. As a result the plan recorded an experience gain of $384,000.

   Both components of the mortality basis for members, namely the rates assumed for the 1998 plan year and the annual reduction factors applying to those rates in subsequent years, were revised in this valuation. As a result the surplus increased by $271,000 and $46,000, respectively, the total being $317,000.

3. **Mortality of Widows**
   During the three-year period ended 31 March 1997, the 25 reported widow deaths amounted to 111% of the 22.5 expected deaths. As a result the plan recorded an experience gain of $323,000.

   Both components of the mortality basis for widows, namely the rates assumed for the 1998 plan year and the annual reduction factors applying to those rates in subsequent years, were revised in this valuation. As a result the surplus increased by $14,000 and $102,000, respectively, the total being $116,000.

4. **Interest Rates**
   In the previous valuation the Fund was assumed to earn interest at an average annual rate of 10.20% during the three-year period ended 31 March 1997. The actual interest rates were modestly higher (averaging 10.41%), causing an experience gain of $171,000.

   The interest rates for this valuation were developed by the procedure described in Section III-C. Adopting this revised interest assumption increased the surplus by $419,000 in total, including an amount of $121,000 attributable to an increment of 0.08% per annum being added for the first time.

5. Withdrawal of Members

In the previous valuation no future withdrawals by members were assumed. During the three-year period ended 31 March 1997, three withdrawals created an experience gain of $76,000.

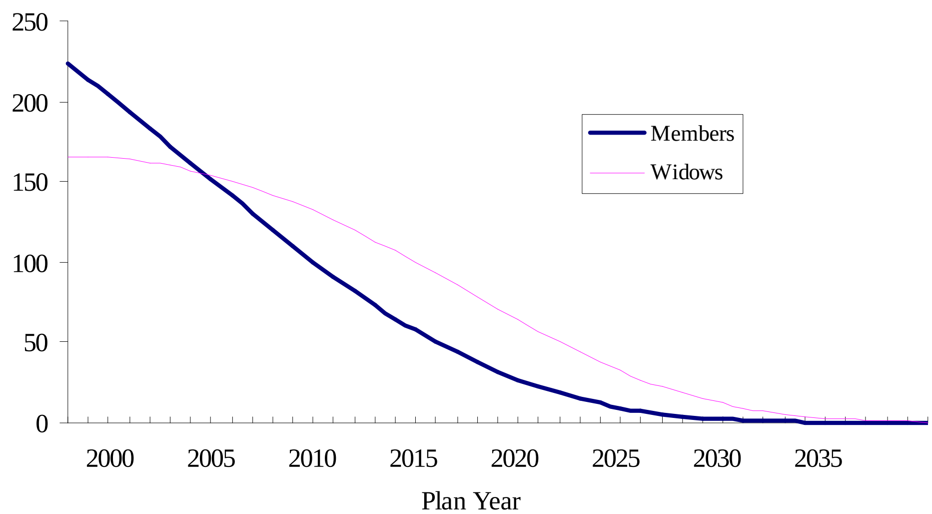
Based on a study of experience from 1990 onward, it was assumed for this valuation that each member would be subject to a withdrawal rate of 0.25% per annum. This new assumption increased the surplus by $139,000.

D- Demographic and Financial Projections

1. Membership Projections

On the basis of the demographic assumptions described in Section IV-C, the numbers of members and widows were projected over the remaining lifetime of the plan. The results are shown in the following graph.

Projected Population



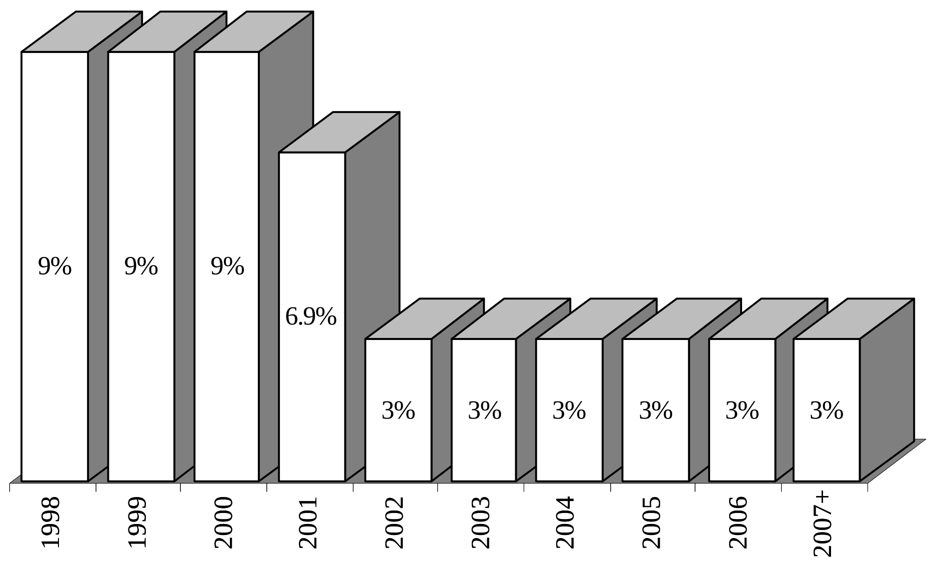
Under this projection the number of members starts at 224 at 1 April 1997 and declines steadily thereafter; similarly, the number of widows declines steadily from its starting figure of 166. The last widow is expected to survive to the plan year 2039.

Emerging mortality experience will be subject to random fluctuations. Consequently the actual membership statistics will deviate, perhaps materially due to the relatively small number of participants, from those shown in the graph.

2. Benefit Improvement Projections

Using the assumptions described in Section IV and the surplus distribution in Section VI, the yearly increases in the amount of a widow pension were projected as shown in the following bar chart.

Projected Benefit Increases at 1 April



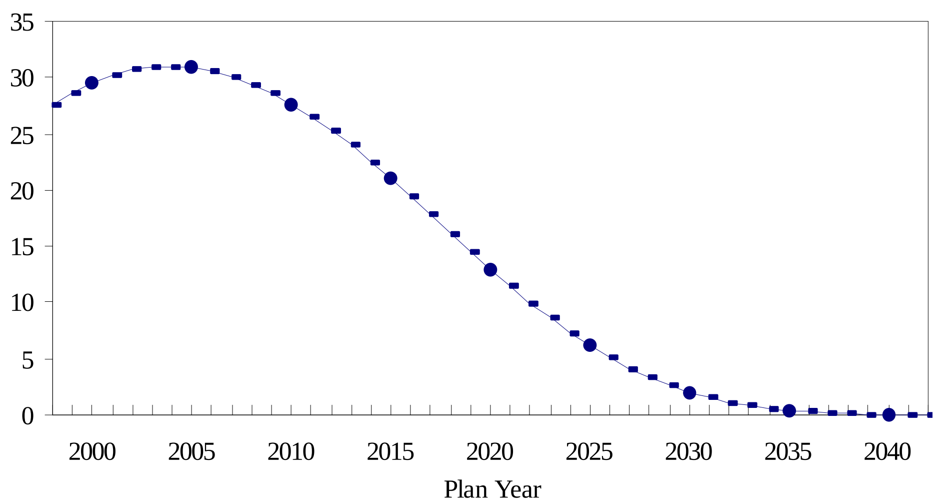
The projected 9% annual increases in the first three years would raise the purchasing power of the widow pensions substantially, given that the rate of inflation is expected to average less than 3% per annum during that period. The projected 3% annual increases beginning in the 2002 plan year would match the expected rate of inflation from that year onward, thereby maintaining the purchasing power of the widow pensions at the high point reached in the 2001 plan year.

The lump sum benefit payable upon the death of a member was projected to increase at 3% per annum, which is roughly the expected average rate of inflation over the remaining lifetime of the plan.

3. Asset Projections

Using the assumptions described in Section IV and the foregoing benefit improvement projections, the Fund assets were projected as shown in the following graph.

Projected Assets
($ millions)



Under this projection the Fund assets reach their maximum of $30,970,000 in the plan year 2004 and decline steadily thereafter until the Fund is exhausted in the plan year 2039.

The actual progress of the Fund assets will be subject to several influences, most notably the random mortality fluctuations affecting the membership projections.

VI- Conclusions

A- Recommended Disposition of Surplus

The $8,622,000 surplus estimated for this report is large relative to the liabilities of $19,040,000. However, only minor amounts of surplus are expected to arise from future experience. Therefore the current surplus, together with interest thereon, effectively must provide for all benefit increases until the Fund is exhausted in the plan year 2039 or thereabouts.

The recommended future benefit increases are intended to distribute the surplus as it is earned relative to the basis upon which contributions were calculated, subject to three constraints. Firstly, for smoothing purposes the effective benefit increase in any year for current and prospective widows is subject to a 9% maximum and a 1% minimum. Secondly, the minimum benefits payable to and in respect of a new widow should be worth at least as much as the lump sum death benefit otherwise payable on the death of her husband. Thirdly, enough surplus must be retained to ensure that the purchasing power of benefits is always maintained. Taking these constraints into account, the amount of surplus recommended for distribution in the 1999 and 2000 plan years is $2,702,000, which could provide the following recommended benefit improvements.

Increase the pension for current and prospective widows and children in accordance with the following table:

Effective date	Dividend increase[1]	Cumulative dividend[1]	Effective increase[2]
1 April 1998	70%	745%	9.0%
1 April 1999	76%	821%	9.0%

Increase the lump sum benefit payable upon the death of a member, in accordance with the following table:

Effective date	Dividend increase[1]	Cumulative dividend[1]	Effective increase[2]
1 April 1998	15%	415%	3.0%
1 April 1999	15%	430%	2.9%

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[1] Expressed in terms of the pensions purchased by contributions.

[2] Percentage increase in the total pension (i.e. the pension purchased by contributions, together with the cumulative dividend applied thereto) in payment at 1 April 1997, or accrued to that date, as applicable.

Increase the residual amount payable on the death of a widow of a member who dies in the 1999 or 2000 plan years, by deeming the member's contributions to be increased by 745% and 821%, respectively.

The remaining $5,920,000 of surplus should be retained in the Fund for future distribution in accordance with the established methodology.

B- Actuarial Standards

In my opinion, for the purposes of this report:

- the data upon which the calculations were based are sufficient and reliable;
- the assumptions used are, in aggregate, appropriate; and
- the valuation methodology employed is appropriate.

This report has been prepared, and my opinion given, in accordance with accepted actuarial practice, and particularly with the Recommendations of the Canadian Institute of Actuaries for Actuarial Advice given with respect to Self-Insured Employee Benefit Plans.

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Chief Actuary
Public Insurance and Pension Programs

Ottawa, Canada
23 April 1998

APPENDIX 1

History of the Plan

The benefit plan associated with the Royal Canadian Mounted Police (Dependants) Pension Fund was established in 1934 when Part IV was added to the *Royal Canadian Mounted Police Act* (RCMP Act). Plan membership was optional for constables on active duty on 1 October 1934; however, it was mandatory for constables appointed to the Force thereafter.

In 1948 Part V (a new pension arrangement) was added to the RCMP Act. Plan members who elected to become contributors under Part V were required to either suspend or terminate their participation in the plan. Moreover the plan was then closed to any new entrants except certain constables whose continuous service dated back to 1 October 1934 or earlier. Lastly the plan was amended so that the government assumed responsibility for any deficit in the Fund.

In 1959 the *Royal Canadian Mounted Police Superannuation Act* and the *Royal Canadian Mounted Police Pension Continuation Act* (PCA) were enacted to provide for all RCMP pension arrangements. The plan was transferred to the PCA, where it remains.

In 1975 the age at which the eligibility of a son for survivor benefits expires was raised from 18 years to 21 years, which already applied to a daughter. In addition survivor benefits were extended to age 25 for unmarried sons and daughters still in school, subject to certain conditions. Lastly the 4% annual interest rate that had always been applied to the Fund balance was replaced by the rate applied to the three major Superannuation Accounts (Public Service, Canadian Forces, and Royal Canadian Mounted Police), which is derived from the yield on a notional long-term bond portfolio (see Appendix 2). The resulting higher interest credits have flowed through to members and survivors in the form of much more generous benefit increases from 1975 onward.

In 1989 marital status was eliminated in determining the eligibility for survivor benefits of a son or daughter between ages 21 and 25. Also eliminated was the provision for reducing the pension of a widow more than 20 years younger than her husband at the date of his death.

In 1993 the plan was amended to allow the payment of pension to a widow cohabiting with a man to whom she is not married.

APPENDIX 2

Summary of Current Plan Provisions

The current provisions of the benefit plan governed by Part IV of the PCA are summarized in this Appendix. However, the Act shall prevail if there is a discrepancy between it and the summary.

A- Membership

As mentioned in Appendix 1, plan membership was compulsory for constables appointed to the Force from 1934 to 1948. Thereafter the plan was essentially closed to new entrants. The last plan member retired from active duty in 1978.

B- Assets

The plan is financed through the Royal Canadian Mounted Police (Dependants) Pension Fund, which forms part of the Public Accounts of Canada. The Fund is credited with all instalment payments made by the members, and charged with all benefit payments when they become due. The Fund is also credited with investment earnings as though net cash flows were invested quarterly in 20-year Government of Canada bonds issued at prescribed interest rates and held to maturity. No formal debt instrument is issued to the Fund by the government in recognition of the amounts therein.

C- Contributions

1. Member Contributions

(a) Current Service

To purchase current service benefits, a member on active duty contributed 5% of pay together with any supplementary amounts in accordance with the scale set out in the PCA.

(b) Past Service

A member on active duty could elect to contribute, either in a lump sum or by equivalent[1] instalments, to purchase benefits in respect of any period of eligible past service, based on his rate of pay at the date of election. Similarly, on promotion to or within the ranks of non-commissioned officers, he could elect to partially or fully upgrade the accrued benefits.

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[1] Based on the mortality rates of the CM(5) Table with interest at 4% per annum.

2. **Government Contributions**
   The PCA requires the Government of Canada to make contributions only if the Fund becomes insolvent. Every valuation to date has revealed a surplus and therefore the government has never contributed directly to the Fund.

D- Investment Earnings

1. **Interest Rate on New Money**
   The interest rate on the newly issued notional bonds is the same as that applying to the Canada Pension Plan, i.e. the average rate on outstanding Government of Canada bonds with 20 or more years to maturity.

2. **Allocation of Investment Earnings**
   Investment earnings are credited every three months to the Fund on the basis of the yield in the preceding quarter on the notional bond portfolio underlying the combined Superannuation Accounts of the Public Service, Canadian Forces, and Royal Canadian Mounted Police pension plans.

E- Basic Death Benefits

The amount of basic benefit is determined solely in accordance with the terms of the PCA, without reference to any cumulative dividend (see next subsection) that may be payable. The following lump sum and pension benefits, as applicable, are payable on the death of a member who has made the scheduled contributions and has left them in the Fund. In light of the advanced ages of the current members, any survivor benefits payable to a child or eligible student are ignored.

1. **Widow Pensions**
   A widow is entitled to the pension purchased by the member’s contributions at the rates specified in Table II of the Schedule to the PCA. In many cases the pension is approximately equal to 1.5% of the member’s final pay multiplied by his years of credited service. The pension is payable for life. If the widow dies before receiving payments at least equal to the member’s contributions, then a residual amount is payable.

2. **Lump Sum Benefits**
   If a member is not survived by a widow, a lump sum payment is made to the dependants and relatives of the member who are, in the opinion of the relevant Minister, best entitled to share the benefit. The lump sum amount is equal to the present value[1] of a pension to a hypothetical widow 20 years older than the member at his death, but not exceeding 75 years of age.
3. **Benefit Limitation**

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[1] Based on the mortality rates of the a(f) Ultimate Table with interest at 4% per annum.

The basic pension payable to the widow of a member who married after age 60 is reduced to ensure that the present value[1] of her pension does not exceed the lump sum otherwise payable on his death.

F- Cumulative Dividends on Basic Death Benefits

If the Fund is substantially in excess of the amount required to make adequate provision for the prospective payments to be made out of it, the Governor in Council may by order increase all the plan benefits, or any of them, in such manner as may appear equitable and expedient.

Until 31 March 1991 the benefit increases took the form of cumulative dividend percentages applied equally to all basic death benefits except the residual amount payable on the early death of a widow. Effective 1 April 1991 separate cumulative dividend percentages for lump sum benefits and for pensions to widows were introduced. At the same time, cumulative dividends first became applicable to the residual amount payable on the early death of a widow.

The cumulative dividends that may be declared are not subject to the limitations on the basic death benefits described in subsection B-3 above.

G- Withdrawal Benefits

A member can elect at any time to withdraw his contributions from the Fund, without interest; neither he nor any of his dependants has any entitlement under the plan thereafter.

H- Instalment Payments

A member can elect at any time to discontinue instalment payments being made in respect of a past service election. The present value[2] of the discontinued payments is thereupon converted into an equivalent[3] amount of basic death benefit and his accrued basic death benefit is reduced accordingly. In turn, this causes a reduction in the amount of the cumulative dividend.

If a member dies while making instalment payments, his entitlement under the plan remains unchanged because all required payments are deemed to have been made.

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[1] Based on the mortality rates of the a(f) Ultimate Table with interest at 4% per annum.

[2] Based on the mortality rates of the CM(5) Table with interest at 4% per annum.

[3] Based on the rates in Table II of the PCA.

APPENDIX 3

Members as at 31 March 1997

Age Last Birthday	Number	Accrued Widow Pensions[1] Average	Total
65-69	40	$14,700	$588,000
70-74	61	14,000	854,000
75-79	69	10,900	752,000
80-84	39	10,600	413,000
85-89	15	10,100	152,000
All ages	224[2]	$12,317	$2,759,000

Average age last birthday: 75.5 years

[1] Amounts reflect the basic pension together with the 675% cumulative dividend effective from 1 April 1997 for widows.

[2] Of these members, 76 were making instalment payments for life in respect of past service elections. The aggregate annual amount was $14,152 (average was $186).

APPENDIX 4

Widows as at 31 March 1997

Age Last Birthday	Number	Annual Pension Payments[1] Average	Total
55-59	1	$ 6,000	$ 6,000
60-64	5	12,800	64,000
65-69	20	13,900	278,000
70-74	40	8,600	344,000
75-79	32	10,200	326,000
80-84	40	6,900	276,000
85-89	22	7,000	154,000
90-94	5	5,800	29,000
95-99	1	4,000	4,000
All ages	166	$ 8,922	$1,481,000

Average age last birthday: 77.1 years

[1] Amounts reflect the basic pension together with the 675% cumulative dividend effective from 1 April 1997.

APPENDIX 5

Assumed Mortality of Members

Age Last Birthday	Current[1] Annual Rates	Future[1] Annual Rate Reductions
65	.0128	1.7 %
70	.0214	1.8
75	.0327	1.7
80	.0588	1.3
85	.0914	1.0
90	.1379	.7
95	.2300	.5
100	.3163	.4
105	.4111	-
110	.4908	-
115	.5000	-

[1] *Current* means the 1998 plan year and *future* means the plan years thereafter.

APPENDIX 6

Assumed Withdrawal Rates of Members

Annual rate at all ages: .0025

APPENDIX 7

Assumed Mortality of Widows

Age Last Birthday	Current[1] Annual Rates	Future[1] Annual Rate Reductions
55	.0042	1.0 %
60	.0064	.7
65	.0101	.7
70	.0167	.7
75	.0288	1.0
80	.0474	.9
85	.0781	.8
90	.1305	.5
95	.2199	.4
100	.3059	.3
105	.4019	-
110	.4855	-
115	.5000	-

[1] *Current* means the 1998 plan year and *future* means the plan years thereafter.

APPENDIX 8

Assumptions for Prospective Widows

Age Last of Member at Death	Proportion of Members Married	Widow Age Difference[1]
65	.96	(3)
70	.91	(3)
75	.84	(3)
80	.76	(4)
85	.65	(4)
90	.48	(5)
95	.30	(6)
100	.16	(8)
105	.07	(11)
110	.03	(14)
115	.01	(18)

[1] Age of widow less age of member, both calculated at death of member.