



Office of the Superintendent of  
Financial Institutions Canada

Office of the Chief Actuary

Bureau du surintendant des  
institutions financières Canada

Bureau de l'actuaire en chef

# Actuarial Report on the Government Annuities

As at 31 March 2023  
Office of the Chief Actuary



OSFI  
BSIF

Canada 

## Table of Contents

	Page
1 Executive Summary .....	4
1.1 Purpose of Report .....	4
1.2 Data, Method and Assumptions .....	4
1.3 Results.....	4
1.4 Conclusion.....	5
2 Introduction.....	6
3 Data .....	7
3.1 Data Required .....	7
3.2 Member Data.....	7
3.3 Asset Data .....	8
4 Methods and Assumptions.....	9
4.1 Liability Valuation Method.....	9
4.2 Assumptions.....	9
4.3 Asset Valuation Method .....	9
5 Results .....	10
5.1 Balance Sheet .....	10
5.2 Calculation of Interest.....	11
5.3 Development of Actuarial Liabilities .....	12
6 Experience .....	13
6.1 Analysis of Experience .....	13
6.2 Alternative Assumptions for Purposes of the Account’s Financial Statements, Prepared in Accordance with Section 4600 of Part IV of the CPA Canada Handbook – Accounting.....	13
7 Actuarial Opinion.....	14
Appendix A — Contract Types .....	15
Appendix B — Membership Data .....	17
Appendix C — Sources of Data .....	21
Appendix D — Mortality Tables .....	22
Appendix E — Alternative Mortality and Discount Rate Assumptions .....	24

## List of Tables

	Page
Table 1	Financial Results as at 31 March 2023 .....4
Table 2	Membership as at 31 March 2023 .....4
Table 3	Multipliers for Deferred Pension Amounts .....7
Table 4	Balance Sheet .....10
Table 5	Calculation of Interest for Vested Members .....11
Table 6	Calculation of Interest for Deferred Members .....11
Table 7	Calculation of Total Interest .....11
Table 8	Development of Vested Member Actuarial Liabilities .....12
Table 9	Development of Deferred Member Actuarial Liabilities .....12
Table 10	Development of Actuarial Liabilities .....12
Table 11	Gains (Losses) .....13
Table 12	Contract Types 10-16: Vested Ordinary Life .....17
Table 13	Contract Types 21-29: Vested Guaranteed .....18
Table 14	Contract Types 30-37: Vested Joint & Survivor .....18
Table 15	Contract Types 50 & 80: Vested Certain .....18
Table 16	Contract Type 60: Vested Temporary .....18
Table 17	Contract Types 70 – 79: Vested Reducing .....19
Table 18	Contract Types 10: Deferred Ordinary Life .....19
Table 19	Contract Types 21-24: Deferred Guaranteed .....19
Table 20	Vested Membership Reconciliation .....20
Table 21	Deferred Membership Reconciliation .....20
Table 22	Mortality Rates .....22
Table 23	Life Expectancies .....23
Table 24	Development of Vested Member Actuarial Liabilities (with Experience-Adjusted Mortality and Alternative Discount Rate) .....25
Table 25	Development of Deferred Member Actuarial Liabilities (with Experience-Adjusted Mortality and Alternative Discount Rate) .....25
Table 26	Development of Actuarial Liabilities (with Experience-Adjusted Mortality and Alternative Discount Rate) .....25
Table 27	Sample Mortality Rates – Male (Experience-Adjusted Mortality) .....26
Table 28	Sample Mortality Rates – Female (Experience-Adjusted Mortality) .....26
Table 29	Reconciliation of Actuarial Liability (with Experience-Adjusted Mortality and Alternative Discount Rates) .....27
Table 30	Calculation of Interest for Vested Members (with Experience-Adjusted Mortality and Alternative Interest Rates) .....28
Table 31	Calculation of Interest for Deferred Members (with Experience-Adjusted Mortality and Alternative Interest Rates) .....28
Table 32	Calculation of Total Interest (with Experience-Adjusted Mortality and Alternative Interest Rates) .....28

## 1 Executive Summary

### 1.1 Purpose of Report

In accordance with section 15 of the *Government Annuities Improvement Act* (“the Improvement Act”) an actuarial valuation was conducted as at 31 March 2023 for purposes of determining the actuarial liabilities and financial position of the Government Annuities Account (“the Account”). Section 15 of the Improvement Act also states that any surplus or deficit emerging as a result of the actuarial valuation shall be reported and, in the case of a surplus, credited to the Federal Government’s Consolidated Revenue Fund (CRF) and charged to the Account or, in the case of a deficit, charged to the Federal Government’s CRF and credited to the Account.

### 1.2 Data, Method and Assumptions

Data on current retirees, beneficiaries, deferred members, premiums and benefit payments were provided by Employment and Social Development Canada (ESDC) and Service Canada. The Government Annuities Branch located in Bathurst administers the annuities. The data are from a reliable source. We have performed summary tests on the data, and have found that they are accurate, reliable and sufficient for the purposes of the valuation. A description of contract types and a summary of the data are shown in Appendix A and Appendix B of this report. The actuarial liabilities are the present value of expected future benefits, determined in accordance with accepted actuarial practice and statutory valuation assumptions. Subsection 3(4) of the *Government Annuities Regulations* (“the Regulations”) states that the actuarial liability is to be determined using an interest rate of 7% per annum and the mortality rates of the Annuity Table for 1983, as modified by Projection Scale G.

### 1.3 Results

Tables 1 and 2 below summarize the results of the actuarial valuation as at 31 March 2023.

**Table 1 Financial Results as at 31 March 2023**  
(\$)

Assets	59,972,022
Liabilities	58,866,929
Surplus (Deficit)	1,105,092

**Table 2 Membership as at 31 March 2023**

	Count	Average Annual Pension (\$)
Vested Members	15,115	698
Deferred Members	34	1,854
Total	15,149	701

#### **1.4 Conclusion**

The surplus of \$1,105,092 is credited to the Federal Government's CRF and charged to the Account. The next valuation will be performed as at 31 March 2024.

## 2 Introduction

The Canadian *Government Annuities Act* of 1908 was one of the earliest significant pieces of social legislation in Canada. Its purpose was to encourage Canadians to prepare financially for their retirement. Government Annuities were purchased either by individuals or by employers as pension plans for their employees.

By the 1960's, other social benefit plans, such as Old Age Security (OAS) and the Canada Pension Plan were introduced and began gaining importance in providing Canadians with basic retirement income. The government's recognition that retired Canadians could now be served by other social security programs as well as the private sector brought about the decision to disband the Annuities sales force. In 1975, an Act of Parliament formally ended the sale of Government Annuities. Employers, however, could register new employees under group contracts until 1979. The Government Annuities are not sponsored by the Government – meaning the Government has no fiduciary liability. Its responsibilities are limited to provide and secure benefits in accordance with each contract's provisions.

The Annuities Branch continues to administer contracts under payment and those due to become payable, on behalf of clients from across Canada and around the world. The Account is not subject to any federal or provincial pension legislation; it is only subject to the *Government Annuities Act*, the Improvement Act and the Regulations. The assets and liabilities are shown in the Public Accounts of Canada. The assets are notional and are not subject to any investment policy or performance goals and objectives.

The Office of the Chief Actuary (OCA), Office of the Superintendent of Financial Institutions Canada (OSFI), has the mandate of performing the annual actuarial valuation of the Account as of 31 March 2023. The purpose of the valuation is to establish the Account's liabilities, notional assets, and financial position, based on the statutory valuation assumptions.

### 3 Data

#### 3.1 Data Required

Since the actuarial valuation determines both the assets and the liabilities, full details on the members as well as on the cash flows that occurred within the year are needed.

#### 3.2 Member Data

Basic data on pensioners, beneficiaries and deferred members are provided by ESDC and Service Canada. The reports provided show the member data required to establish the liabilities: certificate number, maturity date, member, spouse and beneficiaries' gender and dates of birth, annual pension amounts, and form of pension.

The required data reports are VY4741 for vested members (pensioners) and GY5642 for deferred members (members with deferred rights).

##### *Notes on VY4741 Vested Data*

Additional pension amounts data are required from Service Canada concerning the continuing pensions for joint and survivor contracts with percentages other than 50% or 100%, as well as for reducing annuities. VY4741 data does not show the accurate continuing pension amounts for annuities of type 29, 37, and 70-79.

Moreover, manual additions must be done, as the VY4741 report excludes certain members due to internal validation controls at Bathurst. The data related to this limited number of members were extracted from the VY5141 report. There were 27 such members as at 31 March 2023.

##### *Notes on GY5642 Deferred Data*

Pursuant to the Improvement Act which granted annual accrual of contributions accounts at 7% from 1 April 1975, the following table shows the multipliers that must be applied to the annual original pension amounts.

**Table 3 Multipliers for Deferred Pension Amounts**

Premium Series	Original	
	Interest Rate	Multiplier
4	4.0%	1.22
5	3.0%	1.32
6	3.5%	1.29
7	4.0%	1.22
8	5.0%	1.14

These multipliers reflect the increase between the original interest rate applicable on the contracts and 7%. As the deferred members data only show the pension amounts prior to the enhancements, these multipliers are used to update the annual pensions.

It can be seen that the methodology used to derive these multipliers granted higher increases to contracts with lower interest rates, and vice-versa. The objective sought at the time was to distribute the increases as equitably as possible.

A reconciliation of pension amounts and membership status with last year's membership has been performed. A detailed summary of membership data is shown in the Appendix B of this report.

### **3.3 Asset Data**

Income consists of premiums received, funds reclaimed from the CRF for previously untraceable annuitants, notional earned interest and any transfer needed to cover the actuarial deficit. Payments and other charges represent matured annuities, commuted value of death benefits, premium refunds and withdrawals, and transfers to the CRF of actuarial surpluses and unclaimed annuities related to untraceable annuitants.

All reports used to determine the value of assets are provided by ESDC.

A list showing the names and short descriptions of the required reports is given in Appendix C of this report.

The data used are considered to be sufficient and reliable for the purposes of the actuarial valuation.



## **4 Methods and Assumptions**

### **4.1 Liability Valuation Method**

The actuarial liabilities are associated with two groups of members: vested and deferred. The vested group consists of the participants for whom the pensions are in payment as at 31 March 2023. The deferred group consists of members for whom payment of pensions will start in the future. The liabilities are the actuarial present value of future pension payments, the result of discounting the future expected benefits with interest and post-retirement mortality.

### **4.2 Assumptions**

The interest and post-retirement mortality assumptions are statutory, as stated in section 15 of the Improvement Act and subsection 3(4) of the Regulations. Namely, the liabilities must be based on a rate of interest of 7% per annum and on the mortality rates of the Annuity Table for 1983, as modified by Projection Scale G, published in Transactions of the Society of Actuaries, Vol. XXXV (1983), at pages 882 and 883.

Accordingly, the 1983 individual annuity mortality table (IAM83) is used for individual contracts and the 1983 group annuity mortality table (GAM83) is used for group contracts. Both tables are sex-distinct, and are projected for 15 years with Projection Scale G. Furthermore, for consistency with the methodology used to develop these mortality tables, the liabilities were calculated based on the annuitants' attained age (age last) at the valuation date.

Extracts from these mortality tables as well as associated life expectancies can be found in Appendix D of this report.

### **4.3 Asset Valuation Method**

Since section 14 of the *Government Annuities Act* states that the monies received or paid under this act form part of the CRF, the assets are notional. Each year, any difference with the liabilities calculated is either credited (in the case of a surplus) or charged (in the case of a deficit) to the CRF, with a corresponding charge or credit to the Account. Following these adjustments, the assets value as at 1 April 2022 is equal to the 31 March 2022 liabilities. The assets value as at 31 March 2023 prior to any charge or credit to the CRF is obtained by adding interest at 7% on the 1 April 2022 value and adjusting for cash inflows and outflows also at 7% annual interest rate.

## 5 Results

### 5.1 Balance Sheet

The following table presents a summary of the balance sheet of the Account for the 2023 and 2022 fiscal years.

Table 4 Balance Sheet (\$)	Fiscal Year 2022 – 2023	Fiscal Year 2021 – 2022
<b>Assets as at 1 April</b>	<b>66,894,991</b>	<b>75,755,079</b>
<b>Income</b>		
Interest to 31 March	4,256,014	4,822,098
Premiums for Deferred Annuities	-	3,359
Unclaimed annuities recovered from CRF	<u>8,967</u>	<u>2,909</u>
<b>Total Income</b>	<b>4,264,981</b>	<b>4,828,366</b>
<b>Payments and Other Charges</b>		
Payments to Vested Members:		
Vested Regular Annuity Payments	11,095,129 <sup>1</sup>	12,531,186 <sup>2</sup>
Vested Commuted Values	<u>72,814</u>	<u>32,940</u>
Total Payments to Vested Members:	11,167,943	12,564,126
Monies Refunded	2,448	3,129
Values Transferred to CRF (Vested & Deferred)	<u>17,559</u>	<u>40,120</u>
<b>Total Payments and Other Charges</b>	<b>11,187,951</b>	<b>12,607,375</b>
<b>Income Less Payments and Other Charges</b>	<b>(6,922,970)</b>	<b>(7,779,009)</b>
<b>Assets as at 31 March</b>	<b>59,972,022</b>	<b>67,976,070</b>
<b>Surplus charged to the Account and credited to the CRF</b>	<b>(1,105,092)</b>	<b>(1,081,079)</b>
<b>Net Assets as at 31 March</b>	<b>58,866,929</b>	<b>66,894,991</b>
<b>Actuarial Liabilities as at 31 March</b>	<b>58,866,929</b>	<b>66,894,991</b>

<sup>1</sup> Includes annuity and retroactive payments totalling \$9,181 for members recovered from the CRF in fiscal year 2022-2023.

<sup>2</sup> Includes annuity and retroactive payments totalling \$537 for members recovered from the CRF in fiscal year 2021-2022.

## 5.2 Calculation of Interest

Tables 5, 6 and 7 below outline the calculation of the notional 7% annual interest credited to the Account for the 2023 and 2022 fiscal years.

Table 5 Calculation of Interest for Vested Members (\$)		
	Fiscal Year 2022 – 2023	Fiscal Year 2021 – 2022
Prescribed Assets as at 1 April of prior year	4,619,667	5,221,914
Maturities	19,494	23,427
CRF Recoveries	99	168
Annuity Payments	(423,898)	(478,602)
Commutated Values	(2,775)	(1,862)
Transfers to CRF	-	-
<b>Total Interest for Vested Members</b>	<b>4,212,587</b>	<b>4,765,045</b>

Table 6 Calculation of Interest for Deferred Members (\$)		
	Fiscal Year 2022 – 2023	Fiscal Year 2021 – 2022
Prescribed Assets as at 1 April of prior year	62,982	80,942
Premiums	-	212
CRF Recoveries	-	-
Maturities	(19,494)	(23,427)
Refunds	(61)	(502)
Transfers to CRF	-	(172)
<b>Total Interest for Deferred Members</b>	<b>43,427</b>	<b>57,053</b>

Table 7 Calculation of Total Interest (\$)		
	Fiscal Year 2022 – 2023	Fiscal Year 2021 – 2022
Interest for Vested Members	4,212,587	4,765,045
Interest for Deferred Members	43,427	57,053
<b>Total Interest</b>	<b>4,256,014</b>	<b>4,822,098</b>

### 5.3 Development of Actuarial Liabilities

Tables 8, 9 and 10 below outline the Account’s actuarial liabilities by members’ category as at 31 March of 2023 and 2022.

**Table 8 Development of Vested Member Actuarial Liabilities**

	Contract Type	Fiscal Year 2022 – 2023 (\$)	Fiscal Year 2021 – 2022 (\$)
Males, Ordinary Life	10 – 16	27,715,972	31,664,592
Females, Ordinary Life	10 – 16	16,798,721	18,434,224
Males, Guaranteed	21 – 29	6,815,305	7,880,889
Females, Guaranteed	21 – 29	4,001,918	4,198,250
Last Survivor	30 – 37	2,393,926	3,118,023
Reducing at OAS	70 – 79	319,831	467,932
Annuities Certain	50, 80	154,780	198,945
Temporary Annuities	60	6,727	7,025
Suspended Payments		31,582	25,367
<b>Vested Member Actuarial Liability</b>		<b>58,238,762</b>	<b>65,995,247</b>

**Table 9 Development of Deferred Member Actuarial Liabilities**

	Contract Type	Fiscal Year 2022 – 2023 (\$)	Fiscal Year 2021 – 2022 (\$)
Ordinary Life	10	50,964	47,950
Males, Guaranteed	21 – 24	341,925	479,534
Females, Guaranteed	21 – 24	172,442	313,535
Refunds in Process		-	-
Suspense Accounts	Account 721	62,836	58,725
<b>Deferred Member Actuarial Liability</b>		<b>628,167</b>	<b>899,744</b>

**Table 10 Development of Actuarial Liabilities  
(\$)**

	Fiscal Year 2022 – 2023	Fiscal Year 2021 – 2022
Vested Members	58,238,762	65,995,247
Deferred Members	628,167	899,744
<b>Total Actuarial Liabilities</b>	<b>58,866,929</b>	<b>66,894,991</b>

## 6 Experience

### 6.1 Analysis of Experience

As there are no new contracts purchased under the *Government Annuities Act*, the main source of experience gains or losses is the mortality. It includes changes in expected future payments due to the death or survival of annuitants and the difference between actual and expected benefit payments during the year.

The table below presents a reconciliation of the surplus between 31 March 2022 and 31 March 2023.

**Table 11** Gains (Losses)  
(\$)

<b>Surplus as at 31 March 2022</b>	-
Premiums paid with interest	-
Vested members mortality	1,063,569
Deferred members – retirements, mortality, refunds	42,027
Transfers from CRF and other data changes	(504)
<b>Surplus as at 31 March 2023</b>	<b>1,105,092</b>

### 6.2 Alternative Assumptions for Purposes of the Account’s Financial Statements, Prepared in Accordance with Section 4600 of Part IV of the CPA Canada Handbook – Accounting

#### 6.2.1 Mortality

Following an external audit of the Account as at 31 March 2014, ESDC management asked the OCA to conduct a mortality experience study and to include the amount of the actuarial liabilities under experience-adjusted mortality rates in future Actuarial Reports on the Government Annuities.

#### 6.2.2 Discount Rate

To promote greater comparability with other public service pension plans that are part of the Public Account of Canada, the liabilities shown in the Account’s financial statements is measured using a different discount rate than the prescribed interest rate of 7%. The alternative rate is established based on a yield curve approach. This yield curve is determined by reference to market yields at the end of the reporting period on Government of Canada Bonds and treasury bills.

The OCA has determined that the liabilities as at 31 March 2023 under experience-adjusted mortality rates and the alternative discount rate is \$68.0 million, which is \$9.2 million higher than under the prescribed assumptions. More details are presented in Appendix E.

## 7 Actuarial Opinion

In our opinion, considering that this report was prepared pursuant to the *Government Annuities Act* and the *Government Annuities Improvement Act*:

- the data on which this report is based are sufficient and reliable for the purposes of this report;
- the assumptions used comply with legislative requirements;
- the methods employed are appropriate for the purposes of this report; and
- as at 31 March 2023, there is a surplus of \$1,105,092 which is credited to the Federal Government's Consolidated Revenue Fund and charged to the Government Annuities Account.

This report has been prepared, and our opinion given, in accordance with accepted actuarial practice in Canada. As of the date of the signing of this report, we have not learned of any events that would have a material impact on the results presented in this report as at 31 March 2023.



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Fellow of the Canadian Institute of Actuaries  
Office of the Chief Actuary, OSFI



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Office of the Chief Actuary, OSFI

Ottawa, Canada  
28 July 2023

## Appendix A — Contract Types

The following describes the annuities provisions as specified by the contracts:

**Ordinary Life:** At maturity, this annuity is payable for as long as the annuitant lives, but at death the annuity ceases immediately and there are no death benefits.

**Guaranteed:** The annuity under this contract is payable for life but it is guaranteed for a minimum period of 5, 10, 15 or 20 years.

**Contingent Survivor:** This annuity is based on two lives. The annuity is payable to the principal annuitant for as long as he or she lives. At death, the annuity is payable to the survivor until his or her death.

**Joint and Last Survivor:** This contract differs from the Contingent Survivor contract in that the annuity instalments are payable to both parties. After the death of one partner, the annuity is made payable to the survivor as long as he or she lives.

**Reducing Option:** The Reducing Option is an arrangement whereby the level of the annuity purchased is paid at an increased amount from age 50 (or later) to age 65. At age 65, the annuity decreases by the amount of Old Age Security in effect at the date of maturity. The annuity is payable for life, with death benefits available for the duration of the guaranteed period, if there is one.

The following describes the contract types:

### Single Life - No Guarantee (10 – 16)

10. Ordinary
11. Guarantee expired: on valuation change of 21 – 24
12. From last or contingent survivor: 30, 35, 36, 37
13. From last survivor guarantee expired: on first death of 31
14. From reducing ordinary: on reduction of 70
15. From reducing guaranteed: on reduction of 79, on valuation change of 29 or from 71-74 where reduction and end of guarantee coincide
16. From reducing survivor: 36, 37

### Single Life with Guarantee (21 – 29)

21. Guaranteed 5 years
22. Guaranteed 10 years
23. Guaranteed 15 years
24. Guaranteed 20 years
29. From 71-74 after reduction still within guarantee

**Joint Lives No Guarantee (30 – 37)**

- 30. Ordinary Last Survivor (100%)
- 31. Last Survivor guarantee expired (100%)
- 35. Contingent Survivor (100%)
- 36. Contingent Survivor reducing by one half at death of Principal Annuitant (50%)
- 37. Contingent Survivor reducing by any other amount at death of Principal Annuitant

**Annuities Certain (50 & 80)**

- 50. Certain level amount (Includes from 80 after reduction)
- 80. Certain, reducing

**Temporary Annuities (60)**

- 60. Temporary

**Reducing Annuities (70 – 79)**

- 70. Ordinary, reducing
- 71. Guaranteed 5 years, reducing
- 72. Guaranteed 10 years, reducing
- 73. Guaranteed 15 years, reducing
- 74. Guaranteed 20 years, reducing
- 79. From 71-74, guarantee expired before reduction



## Appendix B — Membership Data

### B.1 Vested members at 31 March 2023

Tables 12 to 17 summarize the vested member data as at 31 March 2023. Each table presents the average annual pension, member count and average age for both genders for each vested contract type. Additional information is included in certain tables when it is relevant for the particular contract type.

<b>Table 12 Contract Types 10-16: Vested Ordinary Life</b>				
Age		Males	Females	Total
	Average Annual Pension (\$)	901	946	927
50-69 <sup>1</sup>	Number	51	69	120
	Average Age (years)	66.2	66.5	66.4
<hr style="border-top: 1px dashed black;"/>				
	Average Annual Pension (\$)	908	783	846
70-79	Number	635	632	1,267
	Average Age (years)	76.3	75.9	76.1
<hr style="border-top: 1px dashed black;"/>				
	Average Annual Pension (\$)	657	560	626
80-89	Number	4,370	2,085	6,455
	Average Age (years)	85.4	85.1	85.3
<hr style="border-top: 1px dashed black;"/>				
	Average Annual Pension (\$)	700	563	649
90-100	Number	3,479	2,087	5,566
	Average Age (years)	93.2	93.7	93.4
<hr style="border-top: 1px dashed black;"/>				
	Average Annual Pension (\$)	692	477	562
100 +	Number	74	113	187
	Average Age (years)	102.0	102.4	102.3
<hr style="border-top: 1px dashed black;"/>				
	Total Average Annual Pension (\$)	695	593	658
	Total Number	8,609	4,986	13,595
	Total Average Age (years)	87.9	87.7	87.8

<sup>1</sup> The age range of 50 to 59 only contains 1 individual and was combined with the age range of 60 to 69 to alleviate privacy concerns.

ACTUARIAL REPORT ON THE GOVERNMENT ANNUITIES  
AS AT 31 MARCH 2023

Table 13 Contract Types 21-29: Vested Guaranteed				
Age		Males	Females	Total
50-69	Average Annual Pension (\$)	1,981	2,036	2,005
	Number	120	93	213
	Average Age (years)	66.6	66.4	66.5
	Average guarantee (years)	8.9	8.5	8.7
70-79	Average Annual Pension (\$)	1,537	1,223	1,431
	Number	307	156	463
	Average Age (years)	74.5	74.4	74.5
	Average guarantee (years)	5.3	4.6	5.0
80-89	Average Annual Pension (\$)	1,402	1,148	1,339
	Number	33	11	44
	Average Age (years)	81.2	81.6	81.3
	Average guarantee (years)	2.9	3.3	3.0
Total Average Annual Pension (\$)		1,643	1,511	1,595
Total Number		460	260	720
Average Age (years)		72.9	71.9	72.5
Average guarantee (years)		6.1	5.9	6.0

Table 14 Contract Types 30-37: Vested Joint & Survivor				
	Males	Females	Total	
Total Average Annual Pension (\$)	508	237	500	
Total Number	735	21	756	
Average Age (years)	87.3	85.6	87.3	
Average Spouse Age (years)	84.0	84.6	84.1	
Average Continuing Percentage	73%	68%	73%	

Table 15 Contract Types 50 & 80: Vested Certain		Total
Average Annual Pension (\$)		1,289
Number		31
Average Certain Period (years)		5.0

Table 16 Contract Type 60: Vested Temporary		Total
Average Annual Pension (\$)		674
Number		3
Average Age (years)		61.0
Average Period (years)		4.0

**Table 17 Contract Types 70 – 79: Vested Reducing**

	Males	Females	Total
Average Annual Pension (\$)	4,816	4,293	4,607
Number	6	4	10
Average Reduced Annual Pension (\$)	2,469	2,362	2,426
Average Age (years)	63.2	62.5	62.9

## B.2 Deferred Members at 31 March 2023

Tables 18 and 19 summarize the deferred member data as at 31 March 2023. Each table presents the average annual pension, member count and average age for both genders for each deferred contract type. Table 19 also includes the average guarantee period.

**Table 18 Contract Types 10: Deferred Ordinary Life**

	Total
Average Annual Pension (\$)	3,202 <sup>1</sup>
Number	2
Average Age (years)	68.0

**Table 19 Contract Types 21-24: Deferred Guaranteed**

	Males	Female	Total
Average Annual Pension (\$)	2,139	1,229	1,769
Number	19	13	32
Average Age (years)	63.2	61.9	62.7
Average Guarantee (years)	15.5	15.4	15.5

<sup>1</sup> The average pension has been updated from the amount of \$3,224 as at 31 March 2022 due to a small data correction.

### B.3 Membership Reconciliation

**Table 20 Vested Membership Reconciliation**

Contract Types	10-16	21-29	30-37	50&80	60	70-79	Total
Count as at 31 March 2022	15,419	835	913	41	3	16	17,227
Maturities	-	14	-	-	1	-	15
Transfers from/to Other Contract Types	250	(112)	(138)	6	-	(6)	-
Deaths or Expired Annuities <sup>1</sup>	(2,066)	(17)	(19)	(14)	(1)	-	(2,117)
Net CRF Transfers <sup>2</sup>	(8)	0	-	(2)	-	-	(10)
<b>Count as at 31 March 2023</b>	<b>13,595</b>	<b>720</b>	<b>756</b>	<b>31</b>	<b>3</b>	<b>10</b>	<b>15,115</b>

**Table 21 Deferred Membership Reconciliation**

Count as at 31 March 2022	51
Maturities	(15)
Deaths and Refunds	(2)
Net CRF Transfers	-
<b>Count as at 31 March 2023</b>	<b>34</b>

<sup>1</sup> The 2,117 Deaths or Expired Annuities are composed of 1,407 group certificates and 710 individual contracts.

<sup>2</sup> The 10 net CRF transfers are 6 individual and 4 group contracts transferred to the CRF.

## Appendix C — Sources of Data

### C.1 Reports Required

The following are the reports used in order to perform the Government Annuities Account valuation. The main reports are provided by ESDC and Service Canada.

### C.2 Membership Data

VY4741P1: Basic Vested Data

VY5141: Vested Annuitants to be added manually (Records to be completed using report VY4742P1)

GY5642: Basic Deferred Data

Service Canada also provides accurate pension amounts for plans 16, 37, 70-79, and 29, and additional data for plans 50 and 80. This data consists of pension amounts, reduced pension amounts where applicable, date of reduction and date of final payment. Even though the total actuarial liability is taken directly from VY5141 for plans 50 and 80, it must be individually calculated for purposes of gains and losses analysis.

### C.3 Asset Data

VM3942: Vested benefit payments and maturities by period

GY5646, GM4741, and GM4742: Data related to refunds

Premiums paid are provided by the Annuity Accounting Division of ESDC.

Benefit payments are provided by the Annuity Accounting Division of ESDC.

The monthly VM3942 reports are used to reconcile the Annuity Accounting Division's benefit payments. Ultimately, the Annuity Accounting Division's figures are used for balance sheet purposes. The monthly GM4741 and GM4742 reports are used for group and individual contracts.

### C.4 Other Data

ESDC also provides balances for suspense accounts (GY5644 and GR3442), refunds in progress (GY5941) and suspended payments (VY5443).

## Appendix D — Mortality Tables

### D.1 Projection of Mortality

The mortality assumption is statutory, as stated in section 15 of the Improvement Act and subsection 3(4) of the Regulations. Mortality rates are to follow the Annuity Table for 1983, as modified by Projection Scale G published in Transactions of the Society of Actuaries, Vol. XXXV (1983), at pages 882 and 883. SOR/97-495, s. 2.

Accordingly, the IAM83 table is used for individual contracts and the GAM83 table is used for group contracts. Both tables are used on sex-distinct basis and are projected for 15 years with Projection Scale G. Furthermore, for consistency with the methodology used to develop these mortality tables, the liabilities were calculated based on the annuitants' attained age (age last) at the valuation date.

The following table shows the mortality rates as well as Projection scale G for selected attained ages.

Age	GAM83 Original		IAM83 Original		Projection Scale G		GAM83 Projected		IAM83 Projected	
	Males	Females	Males	Females	Males	Females	Males	Females	Males	Females
10	0.000293	0.000096	0.000382	0.000141	0.007500	0.012000	0.000262	0.000080	0.000341	0.000118
15	0.000325	0.000140	0.000435	0.000188	0.002200	0.007000	0.000314	0.000126	0.000421	0.000169
20	0.000377	0.000189	0.000505	0.000260	0.001400	0.005000	0.000369	0.000175	0.000494	0.000241
25	0.000464	0.000253	0.000622	0.000349	0.001000	0.006500	0.000457	0.000229	0.000613	0.000316
30	0.000607	0.000342	0.000759	0.000441	0.004900	0.010500	0.000564	0.000292	0.000705	0.000376
35	0.000860	0.000476	0.000917	0.000545	0.015000	0.018500	0.000686	0.000360	0.000731	0.000412
40	0.001238	0.000665	0.001341	0.000742	0.020000	0.022500	0.000914	0.000473	0.000990	0.000527
45	0.002183	0.001010	0.002399	0.001122	0.018500	0.021000	0.001650	0.000735	0.001813	0.000816
50	0.003909	0.001647	0.004057	0.001830	0.017500	0.020000	0.003000	0.001216	0.003113	0.001352
55	0.006131	0.002541	0.005994	0.002891	0.016000	0.018500	0.004813	0.001920	0.004706	0.002185
60	0.009158	0.004241	0.008338	0.004467	0.015000	0.017500	0.007300	0.003254	0.006647	0.003428
65	0.015592	0.007064	0.012851	0.007336	0.015000	0.017500	0.012429	0.005420	0.010244	0.005629
70	0.027530	0.012385	0.021371	0.011697	0.013500	0.017500	0.022452	0.009504	0.017429	0.008976
75	0.044597	0.023992	0.035046	0.020127	0.012500	0.016000	0.036929	0.018836	0.029020	0.015802
80	0.074070	0.042945	0.057026	0.036395	0.012500	0.015000	0.061334	0.034234	0.047220	0.029013
85	0.114836	0.069918	0.090987	0.065518	0.012500	0.015000	0.095090	0.055736	0.075342	0.052228
90	0.166307	0.111750	0.134887	0.113605	0.011000	0.013500	0.140882	0.091139	0.114265	0.092652
95	0.234086	0.182419	0.191214	0.174228	0.010000	0.012500	0.201328	0.151052	0.164455	0.144269
100	0.319185	0.295187	0.270906	0.239215	0.004000	0.005000	0.300561	0.273806	0.255099	0.221888
105	0.469531	0.487816	0.405278	0.353414	0.000000	0.000000	0.469531	0.487816	0.405278	0.353414
110	1.000000	1.000000	0.634814	0.584462	0.000000	0.000000	1.000000	1.000000	0.634814	0.584462

## D.2 Life Expectancies

The following table shows life expectancies under the above-stated mortality assumption for selected attained ages.

**Table 23** Life Expectancies  
(Years)

Age	Group Males	Group Females	Individual Males	Individual Females
15	65.4	71.8	67.1	72.2
20	60.5	66.8	62.2	67.3
25	55.6	61.9	57.4	62.4
30	50.7	57.0	52.5	57.5
35	45.9	52.1	47.7	52.6
40	41.0	47.2	42.9	47.7
45	36.2	42.3	38.1	42.8
50	31.6	37.5	33.5	38.0
55	27.1	32.7	29.1	33.3
60	22.8	28.1	24.8	28.7
65	18.7	23.6	20.7	24.3
70	15.0	19.3	16.9	20.0
75	11.8	15.3	13.5	16.0
80	9.1	11.9	10.5	12.4
85	7.0	9.1	8.1	9.3
90	5.3	6.6	6.2	6.9
95	4.0	4.6	4.6	5.1
100	2.8	2.9	3.2	3.6
105	1.9	1.9	2.2	2.5
110	1.0	1.0	1.5	1.6

## Appendix E — Alternative Mortality and Discount Rate Assumptions

### E.1 Mortality Rates

The experience-adjusted mortality rates are based on the Canada Pension Plan retirement beneficiaries' mortality assumptions, as developed for the 31<sup>st</sup> Actuarial Report on the Canada Pension Plan as at 31 December 2021. These rates are further adjusted using a 3% load for males and a 4% load for females.

### E.2 Discount Rates

The annual alternative discount rates used to calculate the liabilities are 3.05% as at 31 March 2023 and 2.38% as at 31 March 2022. They are determined using a yield curve approach. Under this approach, the discount rate corresponds to an equivalent flat discount rate based on a yield curve and the projected cash flows. The yield curve is based on market yields at the end of the reporting period on Government of Canada bonds and treasury bills. The Bank of Canada develops and publishes monthly a yield curve for Government of Canada zero-coupon bonds<sup>1</sup>.

Tables 24, 25 and 26 show the development of actuarial liabilities under the experience-adjusted mortality rates and the alternative discount rates while Tables 27 and 28 provide sample experience-adjusted mortality rates at different ages and for different years.

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<sup>1</sup> The methodology to develop this yield curve is set out on the Bank of Canada's website (<http://www.bankofcanada.ca/2004/12/working-paper-2004-48/>).



**Table 24 Development of Vested Member Actuarial Liabilities (with Experience-Adjusted Mortality<sup>1</sup> and Alternative Discount Rate<sup>2</sup>)**

	Contract Type	Fiscal Year	Fiscal Year
		2022 – 2023	2021 – 2022
		(\$)	(\$)
Males, Ordinary Life	10 – 16	30,209,783	36,291,623
Females, Ordinary Life	10 – 16	18,749,365	21,455,414
Males, Guaranteed	21 – 29	9,178,298	11,311,551
Females, Guaranteed	21 – 29	5,455,000	6,116,974
Last Survivor	30 – 37	2,751,416	3,775,361
Reducing at OAS	70 – 79	453,582	712,262
Annuities Certain	50, 80	176,207	235,050
Temporary Annuities	60	6,149	6,965
Suspended Payments		31,582	25,367
<b>Vested Member Actuarial Liability</b>		<b>67,011,382</b>	<b>79,930,567</b>

**Table 25 Development of Deferred Member Actuarial Liabilities (with Experience-Adjusted Mortality<sup>1</sup> and Alternative Discount Rate<sup>2</sup>)**

	Contract Type	Fiscal Year	Fiscal Year
		2022 – 2023	2021 – 2022
		(\$)	(\$)
Ordinary Life	10	77,259	82,481
Males, Guaranteed	21 - 24	588,483	908,886
Females, Guaranteed	21 - 24	281,016	576,500
Refunds in Process		-	-
Suspense Accounts	Account 721	62,836	58,725
<b>Deferred Total</b>		<b>1,009,594</b>	<b>1,626,592</b>

**Table 26 Development of Actuarial Liabilities (with Experience-Adjusted Mortality<sup>1</sup> and Alternative Discount Rate<sup>2</sup>)**  
(\$)

	Fiscal Year	Fiscal Year
	2022 – 2023	2021 – 2022
Vested Total	67,011,382	79,930,567
Deferred Total	1,009,594	1,626,592
<b>Total Actuarial Liabilities</b>	<b>68,020,976</b>	<b>81,557,159</b>

<sup>1</sup> Using mortality assumptions used for the CPP beneficiaries (with appropriate loading) consistent with the 31<sup>st</sup> CPP Actuarial Report for fiscal year 2022-2023 and the 30<sup>th</sup> CPP Actuarial Report for fiscal year 2021-2022.

<sup>2</sup> Using a yield curve approach determined by reference to market yields at the end of the reporting period on Government of Canada Bonds and Treasury Bills (the equivalent flat discount rate is 2.38% as at 31 March 2022 and 3.05% as at 31 March 2023).

ACTUARIAL REPORT ON THE GOVERNMENT ANNUITIES  
AS AT 31 MARCH 2023

**Table 27 Sample Mortality Rates – Male (Experience-Adjusted Mortality)**

Age	2023-24	2033-34	2043-44	2053-54
50	0.002773	0.002473	0.002277	0.002102
55	0.004205	0.003692	0.003397	0.003134
60	0.005257	0.004567	0.004192	0.003862
65	0.011478	0.010054	0.009265	0.008511
70	0.016640	0.014536	0.013360	0.012319
75	0.026293	0.023105	0.021238	0.019610
80	0.045101	0.039715	0.036531	0.033703
85	0.079758	0.069081	0.063502	0.058591
90	0.144455	0.128429	0.120259	0.113004
95	0.246330	0.227150	0.217318	0.208418
100	0.370629	0.351527	0.341497	0.331975
105	0.495122	0.480430	0.473293	0.466759
110	0.610294	0.610716	0.610554	0.610409
115	0.687747	0.687841	0.687990	0.687957
120	1.000000	1.000000	1.000000	1.000000

**Table 28 Sample Mortality Rates – Female (Experience-Adjusted Mortality)**

Age	2023-24	2033-34	2043-44	2053-54
50	0.001788	0.001602	0.001476	0.001362
55	0.002687	0.002368	0.002180	0.002011
60	0.002996	0.002638	0.002426	0.002238
65	0.006657	0.005938	0.005469	0.005046
70	0.010879	0.009752	0.008986	0.008294
75	0.017846	0.016173	0.014919	0.013765
80	0.031829	0.028947	0.026700	0.024654
85	0.057646	0.051356	0.047294	0.043671
90	0.108716	0.097523	0.091375	0.085867
95	0.192431	0.177589	0.169874	0.162913
100	0.302505	0.285415	0.277016	0.269197
105	0.422266	0.407506	0.401046	0.395367
110	0.547038	0.547335	0.547338	0.547316
115	0.636409	0.636448	0.636491	0.636469
120	1.000000	1.000000	1.000000	1.000000

The table below presents a reconciliation of the actuarial liability between 31 March 2022 and 31 March 2023.

**Table 29 Reconciliation of Actuarial Liability (with Experience-Adjusted Mortality<sup>1</sup> and Alternative Discount Rates<sup>2</sup>)**  
(\$)

	Fiscal Year 2022 – 2023	Fiscal Year 2021 – 2022
<b>Liability as at 1 April</b>	<b>81,557,159</b>	<b>97,798,624</b>
Accrued interest	1,795,032	1,354,070
Premiums	-	3,359
Reclaimed annuities	8,967	2,909
Annuity payments	(11,167,943) <sup>3</sup>	(12,564,126) <sup>4</sup>
Premium refunds and other	(2,448)	(3,129)
Unclaimed annuities	(17,559)	(40,120)
Change in mortality assumption	(930,967)	-
Change in discount rates <sup>5</sup>	(2,765,661)	(4,733,007)
Experience and data corrections	(455,604)	(261,421)
<b>Liability as at 1 April</b>	<b>68,020,976</b>	<b>81,557,159</b>

<sup>1</sup> Using mortality assumptions used for the CPP beneficiaries (with appropriate loading) consistent with the 31<sup>st</sup> CPP Actuarial Report for fiscal year 2022-2023 and the 30<sup>th</sup> CPP Actuarial Report for year fiscal 2021-2022.

<sup>2</sup> Using a yield curve approach determined by reference to market yields at the end of the reporting period on Government of Canada Bonds and Treasury Bills (the equivalent flat interest rate is 2.38% for fiscal year 2021-2022 and 3.05% for fiscal year 2022-2023).

<sup>3</sup> Includes annuity and retroactive payments totalling \$9,181 for members recovered from the CRF in fiscal year 2022-2023, and vested commuted value payments of \$72,814.

<sup>4</sup> Includes annuity and retroactive payments totalling \$537 for members recovered from the CRF in fiscal year 2021-2022, and vested commuted value payments of \$32,940.

<sup>5</sup> The discount rate used to calculate liabilities changed from 1.49% in fiscal year 2020-2021 to 2.38% in fiscal year 2021-2022 and 3.05% in fiscal year 2022-2023 based on the yield curve approach.

Tables 30, 31 and 32 below outline the calculation of interest for the 2023 and 2022 fiscal years.

**Table 30 Calculation of Interest for Vested Members (with Experience-Adjusted Mortality<sup>1</sup> and Alternative Interest Rates<sup>2</sup>)**  
(\$)

	Fiscal Year 2022 – 2023	Fiscal Year 2021 – 2022
Experience adjusted liabilities as at 1 April of prior year	1,902,347	1,421,251
Maturities	6,564	4,927
CRF Recoveries	34	36
Annuity Payments	(145,044)	(102,483)
Commutated Values	(951)	(398)
Transfers to CRF	-	-
<b>Total Interest for Vested Members</b>	<b>1,762,950</b>	<b>1,323,333</b>

**Table 31 Calculation of Interest for Deferred Members (with Experience-Adjusted Mortality<sup>1</sup> and Alternative Interest Rates<sup>2</sup>)**  
(\$)

	Fiscal Year 2022 – 2023	Fiscal Year 2021 – 2022
Experience adjusted liabilities as at 1 April of prior year	38,713	35,948
Premiums	-	45
CRF Recoveries	-	-
Maturities	(6,564)	(4,927)
Refunds	(67)	(292)
Transfers to CRF	-	(37)
<b>Total Deferred Members</b>	<b>32,082</b>	<b>30,737</b>

**Table 32 Calculation of Total Interest (with Experience-Adjusted Mortality<sup>1</sup> and Alternative Interest Rates<sup>2</sup>)**  
(\$)

	Fiscal Year 2022 – 2023	Fiscal Year 2021 – 2022
Interest for Vested Members	1,762,950	1,323,333
Interest for Deferred Members	32,082	30,737
<b>Total Interest</b>	<b>1,795,032</b>	<b>1,354,070</b>

<sup>1</sup> Using mortality assumptions used for the CPP beneficiaries (with appropriate loading) consistent with the 31<sup>st</sup> CPP Actuarial Report for fiscal year 2022-2023 and the 30<sup>th</sup> CPP Actuarial Report for fiscal year 2021-2022.

<sup>2</sup> Using a yield curve approach determined by reference to market yields at the end of the reporting period on Government of Canada Bonds and Treasury Bills (the equivalent flat interest rate is 2.38% for fiscal year 2021-2022 and 3.05% for fiscal year 2022-2023). The calculation of interest for the fiscal year is based on the rates at the beginning of the period while the end of period liabilities are based on the rates at the end of the period.