



Office of the Superintendent of  
Financial Institutions Canada

Bureau du surintendant des  
institutions financières Canada

Office of the Chief Actuary

Bureau de l'actuaire en chef

# Actuarial Report

14<sup>th</sup>

on the  
Regular Force  
Death Benefit Account  
as at 31 March 2019

Canada

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30 September 2020

The Honourable Jean-Yves Duclos, P.C., M.P.  
President of the Treasury Board  
Ottawa, Canada  
K1A 0R5

Dear Minister:

Pursuant to Section 72 of the *Canadian Forces Superannuation Act*, I am pleased to submit the report on the actuarial review as at 31 March 2019 of the Regular Force Death Benefit Account established under Part II of this Act.

Yours sincerely,

A handwritten signature in cursive script, reading "ABillig". The signature is written in black ink and is positioned above the typed name of the signatory.

Assia Billig, FCIA, FSA, PhD  
Chief Actuary



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## 1 Executive Summary

This actuarial report on the Regular Force Death Benefit (RFDB) Account was made pursuant to Section 72 of the *Canadian Forces Superannuation Act* (CFSA) which states that “A valuation report on the state of the Regular Force Death Benefit Account shall be prepared ... in accordance with the *Public Pensions Reporting Act* and as if the supplementary death benefit plan established by this Part were a pension plan established under an Act referred to in subsection 3(1) of that Act”.

This actuarial valuation is as at 31 March 2019 and is in respect of the death benefits and contributions defined by Part II of the CFSA.

The previous actuarial report was made as at 31 March 2016. The date of the next periodic review is scheduled to occur no later than 31 March 2022.

### 1.1 Purpose of this Actuarial Report

The purpose of this actuarial valuation is to determine the state of the RFDB Account as well as to assist the President of the Treasury Board in making informed decisions regarding the financing of the government’s death benefit obligation. This is achieved by providing a best-estimate long-term projection of the RFDB Account based on the projected contributions and interest credited to the account and projected death benefits debited from the account.

### 1.2 Valuation Basis

This valuation report is based on the supplementary death benefit (SDB) plan provisions enacted by legislation, summarized in Appendix A. There have been no changes to the plan provisions since the last actuarial valuation report.

The financial data on which this valuation is based is the RFDB Account established to track contributions and benefits under the SDB plan provisions. The account data is summarized in Appendix B.

The participant data provided by the Public Services Procurement Canada (PSPC) are summarized in Appendix C.

This valuation was prepared using accepted actuarial practices in Canada, methods and assumptions which are summarized in Appendices D to F.

All actuarial assumptions used in this report are best-estimate assumptions. They are independently reasonable and appropriate in aggregate for the purposes of the valuation at the date of this report.

Actuarial assumptions used in the previous report were revised based on economic trends and demographic experience. A description of the assumptions is shown in Appendices D and F.

Death benefits are paid out of the Consolidated Revenue Fund of Canada and charged against the RFDB Account. Contributions made by participants and the government are credited to the RFDB Account. Based on the balance of the RFDB Account, interest credits are calculated in such manner and at such rates and credited at such times as the *Canadian Forces Superannuation Regulations* provide.

The following table presents a summary of the ultimate economic assumptions used in this report and a comparison with those used in the previous report.

Table 1 Ultimate Best-Estimate Economic Assumptions

	<u>31 March 2019</u>	<u>31 March 2016</u>
Real increase in average earnings	0.7%	0.8%
Real projected yield on the Regular Force Death Benefit Account	2.5%	2.7%

### 1.3 Main Findings

As at 31 March 2019, the RFDB Account has an actuarial excess of \$54.8 million resulting from the difference between the account balance available for benefits of \$179.5 million and the liabilities of \$124.7 million.

The actuarial excess is projected to vanish gradually and become a shortfall during plan year<sup>1</sup> 2024 because, for each plan year, the projected annual benefits paid will exceed the sum of legislated contributions and projected interest credits.

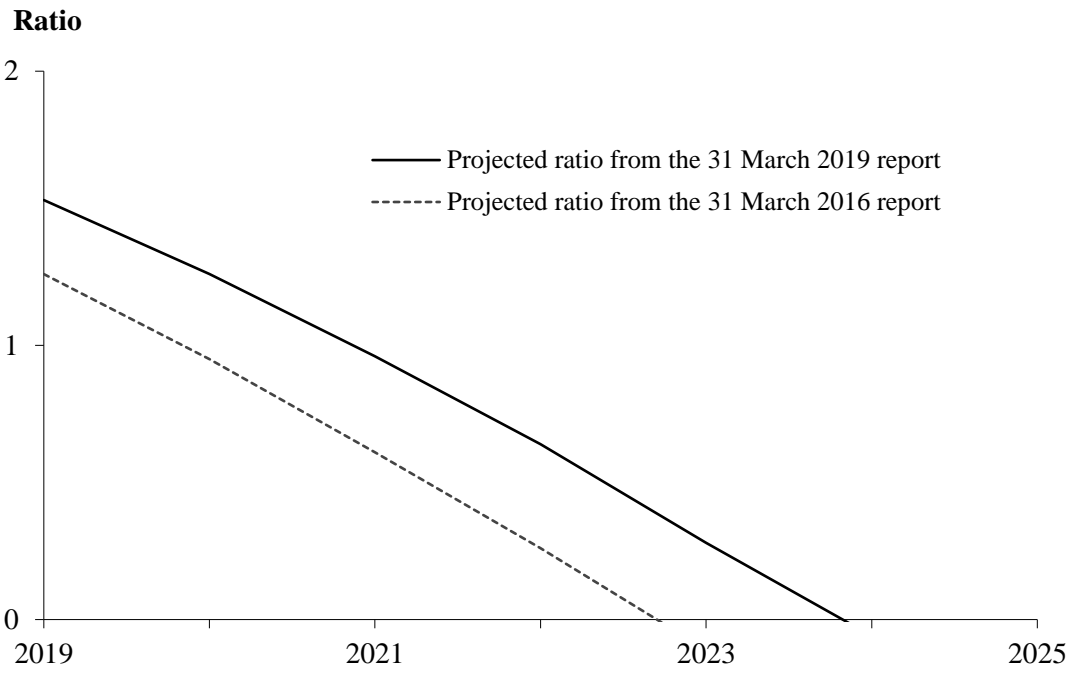
For the same reason, the RFDB Account is projected to become exhausted during plan year 2044.

Figure 1 shows the ratio of the projected actuarial excess at the end of the plan year to the annual benefit payments projected for the following plan year. This ratio is expected to decrease to zero by the end of plan year 2024 as death benefits paid continue to exceed the combined projected contributions and interest credits for all future plan years.

<sup>1</sup> 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.



**Figure 1** Projected Ratio of Actuarial Excess to Annual Benefit Payments  
(Actuarial excess is measured at the end of the plan year and annual payments are those of the following plan year.)



## 2 Financial Position of the Plan

### 2.1 State of Account

The following State of the Account as at 31 March 2019 was prepared using the RFDB Account balance available for benefits described in Appendix B, the data described in Appendix C, the methodology described in Appendix D and the assumptions described in Appendices E and F. The results of the previous valuation are shown for comparison purposes.

	31 March 2019	31 March 2016
<b>Recorded Balance</b>	179.5	185.5
<b>Liabilities</b>		
Paid-up death benefit <sup>1</sup>	119.3	107.0
IBNR <sup>2</sup>	<u>5.4</u>	<u>5.4</u>
<b>Total Liabilities</b>	124.7	112.4
<b>Actuarial Excess</b>	<u>54.8</u>	<u>73.1</u>

### 2.2 Financial Position

At 31 March 2019 the actuarial excess totalling \$54.8 million is 1.5 times the total amount of death benefits projected for plan year 2020. By comparison, the actuarial excess as at 31 March 2016 under the previous report was \$73.1 million, which was 2.1 times the amount of death benefits that were projected for plan year 2017.

As shown in Appendix B.5 and explained in section 4 below, the projected contributions to the plan are less than the projected death benefits for all future plan years. This projected annual shortfall is greater than the projected annual interest credits to the RFDB Account and accordingly entails a continuously decreasing actuarial excess. The actuarial excess is therefore projected to become an actuarial shortfall during plan year 2024, while the RFDB Account is projected to become exhausted in plan year 2044.

### 2.3 The Monthly Benefit Cost Rate

The monthly benefit cost rate is defined as the ratio of the total expected monthly term insurance payments over the total amount of expected monthly term insurance benefit coverage, where coverage is expressed per thousand dollars. In this report, term insurance benefit means the basic benefit less the 10% per year reduction applicable from age 61 and less the \$5,000 paid-up death benefit applicable from age 65. The projected monthly cost for plan year 2044 is 8.9 cents as at 31 March 2019 compared to 10.9 cents projected at the previous valuation.

<sup>1</sup> The \$5,000 portion of the basic benefit for which monthly contributions are no longer required from either the participant or the government. See Appendix D.6.1.

<sup>2</sup> Incurred but not reported claims. See Appendix D.6.2.

## 2.4 Sensitivity of Valuation Results to Variations in Key Assumptions

The following supplementary estimates indicate the degree to which the valuation results depend on some of the key assumptions. These resulting differences can also serve as a basis for approximating the effect of other numerical variations in a key assumption to the extent that such effects are indeed linear.

### 2.4.1 Projected Interest Yields

As a measure of sensitivity, an increment of one percentage point in the projected yields would change from 2024 to 2026 the plan year during which the actuarial excess is projected to become an actuarial shortfall. With such additional interest credit, the RFDB Account is projected to reduce significantly but is not expected to become exhausted over the projection period.

Similarly, a decrease of one percentage point in the projected yields would change from 2024 to 2023 the plan year during which the actuarial excess is projected to become an actuarial shortfall, as well as change from 2044 to 2039 the plan year during which the RFDB Account is projected to become exhausted.

### 2.4.2 Mortality

If the assumed improvements in longevity after the 2020 plan year were disregarded, then the monthly benefit cost rate of 8.9 cents projected for 2044 would climb to 11.6 cents, an increase of 30%. The RFDB Account would become exhausted by plan year 2034 rather than 2044.

However, if the assumed improvements in longevity after the 2020 plan year were kept at the level of plan year 2020, resulting in greater improvements in longevity than those shown in Table 31, then the monthly benefit cost rate of 8.9 cents projected for 2044 would decline to 7.6 cents, a decrease of 15%. With such reduction in cost, the RFDB Account is projected to reduce significantly but is not expected to become exhausted over the projection period.

### 3 Reconciliation of Results with Previous Report

Table 3 illustrates the impact of the updated assumptions, intervaluation economic experience and population changes since the last valuation report as at 31 March 2016. The projected monthly cost for plan year 2044 fell 2 cents from 10.9 cents as at 31 March 2016 to 8.9 cents as at 31 March 2019.

**Table 3 Reconciliation of Monthly Cost**

	Monthly Cost per \$1,000 of Term Insurance in Specified Projection Year (Cents)
<u>Projection Year 2041</u>	
Projection as at 31 March 2016	11.2
<u>Projection Year 2044</u>	
Projection as at 31 March 2016	10.9
Changes to demography of participants	0.0
Change in assumed plan year 2020 mortality rates	(0.3)
Change in longevity improvement factors	(0.7)
Change in disability rates <sup>1</sup>	(0.7)
Change in withdrawal/retirement rates	(0.3)
Change in all other demographic assumptions	0.0
Projection as at 31 March 2019	8.9

As expected, the decrease in the monthly cost is primarily due to a change in the assumed base mortality of both elective and non-elective population but more importantly to the change in the longevity improvement factors. The other major component of the reduction is due to the expected increase in the number of disability 3B.

<sup>1</sup> Any condition rendering a member of the Regular Force mentally or physically unfit to perform his or her duties. A member is discharged under Q. R. & O. 15.01 Article 3B when he or she is unable to perform the duties of his or her own occupation.

## 4 Legislated Contribution Rates

The aggregate amount of death benefit payments projected for plan year 2020 is \$35.8 million, which is made up of \$28.1 million in respect of the term insurance and \$7.7 million in respect of the paid-up insurance. In this report, term insurance means the basic coverage (two times salary rounded to next \$250) less the 10% per year reduction applicable from age 61 and less the \$5,000 paid-up insurance applicable from age 65.

### 4.1 Paid-Up Insurance

For plan year 2020, the estimated single premium at age 65 for each \$5,000 of paid-up insured benefit is \$2,627 for male officers, \$2,846 for male other ranks and \$2,525 for females. The corresponding legislated contribution rates for each \$5,000 of paid-up insured benefit are \$310 and \$291, for males and females respectively. The legislated contributions are determined on the basis of the original \$500 of paid-up insured benefit and were not readjusted on 5 October 1992 when Part II of the CFSA was amended to increase the paid-up insured benefit from \$500 to \$5,000.

The assumed improvements in longevity cause the projected single premium for the paid-up death benefit to decrease over time. In addition, the projected ultimate yield of 4.5% is higher than the yield of 3.7% projected for plan year 2020. This has the effect of gradually decreasing the projected single premium over the years.

The net effect of longevity improvements and increasing projected yields resulted in a decrease in the projected single premiums at age 65 for each \$5,000 of paid-up insured benefit. A male officer and other rank participant's projected single premium decreases respectively from \$2,627 and \$2,846 for plan year 2020 to \$2,583 and \$2,816 for plan year 2044; for a female participant the decrease is from \$2,525 to \$2,474.

### 4.2 Term Insurance

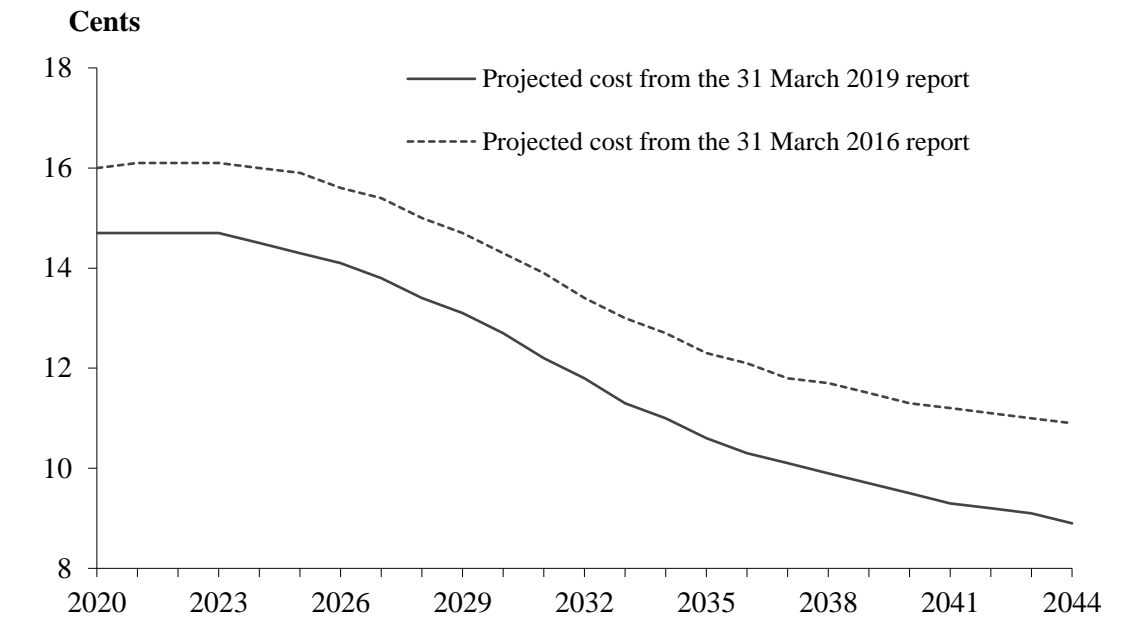
The total amount of term insurance proceeds projected to be payable during plan year 2020 is \$28.1 million. Given that the total amount of term insurance projected to be in force for plan year 2020 is \$15,923 million, the benefit cost rate projected for plan year 2020 is 14.7 cents per month per \$1,000 of term insurance.

Non-elective participants and elective participants in receipt of an immediate annuity are required to contribute monthly 20 cents per \$1,000 of salary, or 9.96<sup>1</sup> cents per \$1,000 of term insurance. As a minimum, the government contribution credited monthly to the RFDB Account is equal to one-twelfth of the total amount of term insurance proceeds payable during the month. For plan year 2020, the government's monthly contribution is estimated at 1.2 cents per \$1,000 of term insurance.

The minimum total amount credited to the RFDB Account resulting from participants and government contributions in plan year 2020 is therefore 11.2 cents (9.96 cents plus 1.2 cents) per month per \$1,000 of term insurance, i.e. significantly less than the estimated monthly cost of 14.7 cents per \$1,000 of term insurance for plan year 2020.

<sup>1</sup> If it were not for the rounding to the next lower multiple of \$250 of salary involved in the computation of contributions and the rounding to the next higher multiple of \$250 involved in the computation of the amount of death benefit, the legislated contribution rate would be 10 cents (i.e. 20 cents divided by two) instead of 9.96 cents.

**Figure 2** Projected Monthly Cost  
(cents per \$1,000 of term insurance)



As shown in Figure 2, the monthly cost per \$1,000 of term insurance is projected level at 14.7 cents until 2022. Thereafter the monthly cost is projected to decrease gradually to reach 8.9 cents by plan year 2044. In comparison, the combined contribution rate in 2044 is projected to be 10.7 cents (i.e. 9.96 cents for participants plus 0.70 cents for the government).

The following table illustrates the projected monthly costs per \$1,000 of term insurance for selected plan years and by participant type.

**Table 4** Projected Monthly Cost  
(cents per \$1,000 of term insurance)

Participants	2020	2023	2028	2034	2039	2044
Non-elective	6.8	6.4	6.0	5.8	5.7	5.5
Elective	27.3	28.6	30.2	28.2	26.0	25.1
All	14.7	14.7	13.4	11.0	9.7	8.9

For non-elective and elective participants, the monthly cost projected for plan year 2044 is respectively 81% and 92% of the monthly cost estimated for plan year 2020. For all plan participants in aggregate, the monthly cost projected for plan year 2044 is 61% of the monthly cost projected for plan year 2020.

This results mainly from the following two factors:

- There is a reduction in cost due to the assumed lower mortality for plan year 2044 in accordance with the longevity improvement factors shown in Table 31 applied to the current mortality rates shown in Table 30.
- As shown in Table 5, the average age of both non-elective and elective participants in plan year 2044 is higher than in plan year 2020. Thus, each population is expected to see an increase in the projected monthly cost. However, due to the projected larger size of the non-elective population, the overall average age is projected to be lower resulting in decreasing costs projected for plan year 2044.

**Table 5 Weighted Average Age Per Insurance Coverage**

Participants	2020	2023	2028	2034	2039	2044
Non-elective	36.6	36.4	36.5	36.9	37.2	37.3
Elective	54.6	55.8	57.2	57.6	57.6	57.9
All	43.4	43.6	42.9	41.7	41.2	40.9

## 5 Actuarial Opinion

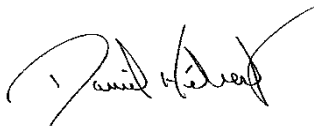
In our opinion, considering that this report was prepared pursuant to the *Public Pensions Reporting Act* per Section 72 of the *Canadian Forces Superannuation Act*,

- the valuation data on which the valuation is based are sufficient and reliable for the purposes of the valuation;
- the assumptions used are individually reasonable and appropriate in aggregate for the purposes of the valuation; and
- the methods employed are appropriate for the purposes of the valuation.

This report has been prepared, and our opinion given, in accordance with accepted actuarial practice in Canada. In particular, this report was prepared in accordance with the Standards of Practice (Standard of Practice – General Standards) published by the Canadian Institute of Actuaries.

We have reflected the impacts of the COVID-19 pandemic on the economic assumptions used in this report. It is important to note that the pandemic is a very fluid situation that will likely continue to evolve for some time. We have estimated the impacts based on the information known at the time the report was prepared. The final impacts of this health and economic crisis will likely generate some differences in the future.

To the best of our knowledge there were no other subsequent events between the valuation date and the date of this report that would have a material impact on the results of this valuation.



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Daniel Hébert, FCIA, FSA



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Assia Billig, FCIA, FSA  
Chief Actuary

Ottawa, Canada

30 September 2020



## Appendix A — Summary of Plan Provisions

Following is a summary description of the main provisions of the Supplementary Death Benefit (SDB) plan established for the members of the Regular Force under Part II - *Supplementary Death Benefits* of the *Canadian Forces Superannuation Act* (CFSA). This plan supplements benefits payable under the pension plan by providing a lump-sum benefit upon the death of a plan participant.

The legislation shall prevail if there is a discrepancy between it and this summary.

### A.1 Plan Participants

#### A.1.1 Non-Elective Participants

The term *non-elective participant* means a member of the Regular Force, or a member of the Reserve Force who is, with the approval of the Chief of the Defence Staff, on full-time service in a position in a Regular Force establishment or as a supernumerary to a Regular Force establishment.

#### A.1.2 Elective Participants

The term *elective participant* means all previously non-elective participants who have ceased to be employed in the Canadian Forces by reason of retirement or disability. A retired member entitled to an immediate annuity, 3A disability annuity (i.e. on medical grounds, being disabled and unfit to perform any duties), or 3B disability annuity (i.e. on medical grounds, being disabled and unfit to perform his own duties in his present trade or employment, and not otherwise advantageously employable under existing service policy) may opt to continue their coverage under the SDB plan. Such right is limited to members who, at the time they cease to be employed in the Canadian Forces, have completed at least five years of continuous service in the Canadian Forces or five years of membership in the SDB plan.

Elective participants entitled to a deferred annuity under the CFSA upon cessation of employment may elect to continue their coverage in the SDB plan; otherwise their membership and coverage are discontinued. This election must be made within the 13-month period running from one year before to the 30th day following cessation of employment. The basic benefit is extended for 30 days after the date of cessation whether or not a participant exercises the right of election for continuous coverage.

An elective participant who becomes a participant in the SDB plan established under Part II of the *Public Service Superannuation Act* (PSSA) automatically ceases to be a participant in the SDB plan established under the CFSA. Any such person, who subsequently ceases to be a participant in the SDB plan under the PSSA, without entitlement to an immediate annuity under the PSSA, is deemed thereupon to regain the status of elective participant in the SDB plan established under the CFSA.

## A.2 RFDB Account Balance

The plan is financed through the RFDB Account, which forms part of the Accounts of Canada. The RFDB Account is credited with all contributions made by the participants and the government, and debited with all benefit payments as they become due. The RFDB Account is also credited with interest earnings based on interest rates applying to the Superannuation Accounts.

## A.3 Contributions

### A.3.1 Non-Elective Participants, and Elective Participants in Receipt of an Immediate Annuity

For non-elective participants as well as elective participants in receipt of an immediate annuity (disability or retirement) under Part I of the CFSA or the *Defence Services Pension Continuation Act*, the legislated contribution rate is 5 cents per month for each \$250 of salary (for this purpose the salary is in practice rounded to the next lower multiple of \$250 if not already equal to such a multiple). When these participants attain age 65, their contribution is reduced by 50 cents per month in recognition of the fact that \$5,000 of basic benefit becomes paid-up (by the government) for the remaining lifetime of the participant.

### A.3.2 Elective Participants Entitled to a Deferred Annuity

For elective participants entitled to a deferred annuity, the contribution rate is set by regulation and varies in accordance with the attained age of the participant, and the corresponding contributions become chargeable on the 30th day immediately following cessation of employment. The contribution rates for selected ages are shown in the following table:

**Table 6 Contribution per \$2,000 of Death Benefit**

Age Last Birthday	Annual (\$)	Monthly (\$)
25	9.70	0.82
30	11.42	0.97
35	13.58	1.15
40	16.29	1.39
45	19.72	1.67
50	24.11	2.05
55	29.80	2.53
60	37.65	3.20

### A.3.3 Government

The government credits monthly to the RFDB Account an amount equal to one-twelfth of the total amount of term insurance death benefits paid in the month.

When a participant, other than one entitled to a deferred annuity, reaches age 65, the government credits to the RFDB Account a single premium for the \$5,000 paid-up insured benefit in respect of which contributions are no longer required from the participant.

The legislated amount of single premium for each such \$5,000 paid-up insured benefit is shown in the following table and corresponds to one-tenth of \$5,000 times the single premium rate for each

dollar of death benefit, computed on the basis of the Life Tables, Canada, 1950-1952 and interest at 4% per annum.

**Table 7** Legislated Single Premium per \$5,000 of Paid-up Benefit

Age Last Birthday	Male (\$)	Female (\$)
65	310	291
66	316	298
67	323	306
68	329	313
69	336	320

Under the statutes, if for whatever reason the RFDB Account were to become exhausted, the Government would then credit special contributions to the RFDB Account in an amount at least equal to the basic benefits then due but not paid by reason of such shortfall.

#### **A.4 Amount of Basic Benefit**

Subject to the applicable reductions described below, the lump-sum benefit payable upon the death of a participant is equal to twice the participant's current salary, the result being rounded to the next higher multiple of \$250 if not already equal to such a multiple. For this purpose, the current salary of an elective participant is defined as the annual rate of pay at the time of cessation of employment in the Canadian Forces.

The amount of basic benefit described above is reduced by 10% per year starting at age 61 until it would normally vanish at age 70. However, the amount of basic benefit cannot at any time be reduced below the paid-up benefit value of \$5,000 subject to the following exceptions:

- For those elective participants who had, upon cessation of employment prior to 5 October 1992, made an election to reduce their basic benefit to \$500 and further had made a second election prior to 5 October 1993, to keep their basic benefit at \$500, the paid-up benefit is \$500 instead of \$5,000. Such election is irrevocable. The plan administrator has advised OSFI that all members who have opted to reduce their paid-up coverage to \$500 will nonetheless be receiving a minimum death benefit of \$5,000 upon death.
- For elective participants entitled to a deferred annuity, there is no coverage past age 70.

Upon ceasing to be employed in the Canadian Forces, elective participants in receipt of an immediate annuity under Part I of the CFSA or the *Defence Services Pension Continuation Act* may opt to reduce their amount of basic benefit to \$5,000.

## Appendix B — RFDB Account Balance Available for Benefits

### B.1 Regular Force Death Benefit Account

The plan is entirely financed through the RFDB Account, which forms part of the Accounts of Canada. The Account records the transactions for the plan, meaning that no formal debt instrument has been issued to the RFDB Account by the government in recognition of the amounts therein. The RFDB Account is:

- credited with all contributions made by participants and the government;
- credited with interest earnings every three months on the basis of the actual average yield for the same period on the combined Superannuation Accounts of the Public Service, Canadian Forces and Royal Canadian Mounted Police pension plans. These accounts generate interest 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; and
- debited with annual benefit payments when they become due.

Table 8 shows the reconciliation of the balance of the RFDB Account from the last valuation date to the current valuation date. Since the last valuation, the RFDB Account balance has decreased by \$6 million. As at 31 March 2019, the Account balance is reported at \$179.5 million. The net reduction in the Account balance is due to actual death benefit payments exceeding the total of contributions and interest earnings over the intervaluation period.

Plan Year	2017	2018	2019	2017 - 2019
Opening balance	185.5	189.5	185.3	185.5
Income				
Employee contributions	18.0	18.8	19.0	55.8
Employer contributions				
- Term insurance	2.6	2.1	2.0	6.7
- Paid-up insurance	0.7	0.5	0.0	1.2
Interest earnings	<u>8.1</u>	<u>7.7</u>	<u>7.0</u>	<u>22.8</u>
Subtotal	29.4	29.1	28.0	86.5
Expenditures				
Benefit claims	25.4	33.3	33.8	92.5
Closing balance	189.5	185.3	179.5	179.5

## B.2 Rates of Interest

As per the *Canadian Forces Superannuation Regulations*, the following effective rates of interest on the RFDB Account by plan year were calculated using the foregoing entries.

**Table 9 Rates of Interest**

Plan Year	Interest
2017	4.43%
2018	4.21%
2019	3.90%

## B.3 Sources of Financial Data

The Account entries shown previously were taken from the Public Accounts of Canada.

#### B.4 Account and Liabilities Projection

The following table shows a projection of the RFDB Account and liabilities over 25 years commencing 1 April 2019.

**Table 10 Account and Liabilities Projection**  
 (\$ millions)

Plan Year	State of the Account at the End of Plan Year			Ratio of Projected Actuarial Excess at the End of the Plan Year to Annual Benefit Payments Projected for the Following Plan Year
	Account	Liabilities	Excess / Shortfall	
2019	<b>179.5<sup>1</sup></b>	124.7	54.8	1.5
2020	172.1	126.5	45.6	1.3
2021	163.9	128.8	35.1	1.0
2022	155.1	131.6	23.5	0.6
2023	145.9	135.4	10.5	0.3
2024	136.5	138.9	(2.4)	-
2025	126.8	142.5	(15.7)	-
2026	117.2	146.2	(29.0)	-
2027	107.7	150.7	(43.0)	-
2028	98.3	154.9	(56.6)	-
2029	89.2	158.5	(69.3)	-
2030	80.3	161.1	(80.8)	-
2031	71.8	162.2	(90.4)	-
2032	63.7	162.3	(98.6)	-
2033	56.2	162.4	(106.2)	-
2034	49.2	162.0	(112.8)	-
2035	42.6	161.2	(118.6)	-
2036	36.4	160.1	(123.7)	-
2037	30.5	158.8	(128.3)	-
2038	24.9	156.9	(132.0)	-
2039	19.5	154.6	(135.1)	-
2040	14.4	152.3	(137.9)	-
2041	9.6	150.2	(140.6)	-
2042	4.9	148.2	(143.3)	-
2043	0.4	146.4	(146.0)	-
2044	0.0	144.7	(144.7)	-

<sup>1</sup> Bold figures denote actual experience.

## B.5 Income and Expenditure Projection

The following table shows a projection of the income and expenditure which served as the basis of the projection of the RFDB Account over 25 years commencing with plan year 2020.

**Table 11** Income and Expenditure Projection  
(\$ millions)

Plan Year	Contributions			Benefit Payments			Interest Credits	Net Credits	
	Participants	Government	Total	Term	Paid-Up	Total			
2020	19.1	2.3	0.6	22.0	28.1	7.7	35.8	6.4	(7.4)
2021	19.3	2.4	0.6	22.3	28.5	7.7	36.2	5.8	(8.2)
2022	19.5	2.4	0.7	22.6	28.9	7.8	36.7	5.2	(8.9)
2023	19.8	2.4	0.8	23.0	29.1	7.8	36.9	4.7	(9.1)
2024	20.0	2.4	0.8	23.2	29.1	7.9	37.0	4.3	(9.5)
2025	20.2	2.4	0.9	23.5	29.1	8.0	37.1	3.9	(9.7)
2026	20.4	2.4	0.9	23.7	28.8	8.0	36.8	3.5	(9.6)
2027	20.6	2.4	1.0	24.0	28.5	8.1	36.6	3.1	(9.5)
2028	20.8	2.3	1.0	24.1	28.0	8.2	36.2	2.7	(9.3)
2029	20.9	2.3	1.0	24.2	27.4	8.3	35.7	2.4	(9.1)
2030	21.1	2.2	0.9	24.2	26.8	8.4	35.2	2.2	(8.8)
2031	21.4	2.2	0.7	24.3	26.1	8.5	34.6	1.9	(8.5)
2032	21.6	2.1	0.6	24.3	25.5	8.6	34.1	1.6	(8.2)
2033	21.9	2.1	0.6	24.6	24.9	8.7	33.6	1.5	(7.6)
2034	22.3	2.0	0.6	24.9	24.4	8.8	33.2	1.3	(7.0)
2035	22.7	2.0	0.6	25.3	24.1	8.8	32.9	1.1	(6.5)
2036	23.1	2.0	0.6	25.7	23.9	8.9	32.8	1.0	(6.1)
2037	23.6	2.0	0.5	26.1	23.8	9.0	32.8	0.9	(5.9)
2038	24.1	2.0	0.5	26.6	23.8	9.1	32.9	0.7	(5.6)
2039	24.6	2.0	0.4	27.0	23.8	9.2	33.0	0.6	(5.4)
2040	25.1	2.0	0.4	27.5	23.8	9.2	33.0	0.5	(5.0)
2041	25.7	2.0	0.4	28.1	24.0	9.3	33.3	0.4	(4.8)
2042	26.3	2.0	0.4	28.7	24.1	9.4	33.5	0.2	(4.6)
2043	26.9	2.0	0.4	29.3	24.3	9.5	33.8	0.1	(4.4)
2044	27.5	6.0	0.4	33.9	24.6	9.7	34.3	-	(0.4)

## Appendix C — Participant Data

### C.1 Source of Participant Data

The Department of National Defence (DND) no longer provide data in respect to non-elective and elective participants of the Regular Force Death Benefit plan. Instead, data were extracted from the master computer files maintained by the Public Services and Procurement Canada (PSPC) which covers the period from 1 April 2009 to 31 March 2019.

Consistency tests were therefore performed to ensure that a status could be established for each member as of 31 March of each year and to ensure consistency between PSPC data and DND data that was used in the previous report. Consistency tests were also performed on all other information required to value member benefits. In some cases, adjustments were made to the raw data, after consulting with the PSPC, based on the omissions and discrepancies identified by the various consistency tests. More details can be found in Appendix the Actuarial Report on the Pension Plans for the Canadian Forces – Regular Force and Reserve Force as at 31 March 2019 published by the Office of the Chief Actuary.

### C.2 Participant Data Summary

Table 12 to Table 22 show the detailed participant data upon which this valuation is based.



Table 12 Reconciliation of Contributors

	Male			Female			Grand Total
	Officer	Other Rank	Total	Officer	Other Rank	Total	
As at 31 March 2016	13,126	44,466	57,592	2,736	6,867	9,603	67,195
Data Corrections (retro active data correction)	864	(1,162)	(298)	232	(110)	122	(176)
<b>New Contributors</b>							
New entrants	2,230	8,838	11,068	713	1,738	2,451	13,519
Rehired / Cash-out	22	133	155	5	16	21	176
Rehired / Pensioners	<u>33</u>	<u>107</u>	<u>140</u>	<u>7</u>	<u>11</u>	<u>18</u>	<u>158</u>
Subtotal	2,285	9,078	11,363	725	1,765	2,490	13,853
<b>Changes of</b>							
Activity Status	-	-	-	-	-	-	-
Officers/Other Ranks	163	(163)	-	50	(50)	-	-
Service Type	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>
Subtotal	163	(163)	-	50	(50)	-	-
<b>Terminations</b>							
Lump-sum payments	-	-	-	-	-	-	-
Return of contribution	(163)	(1,054)	(1,217)	(47)	(135)	(182)	(1,399)
Transfer value	(410)	(2,772)	(3,182)	(96)	(331)	(427)	(3,609)
Rollover Termination	<u>269</u>	<u>1,024</u>	<u>1,293</u>	<u>89</u>	<u>163</u>	<u>252</u>	<u>1,545</u>
Subtotal	(304)	(2,802)	(3,106)	(54)	(303)	(357)	(3,463)
<b>Pensionable Terminations</b>							
Disability (3A)	-	-	-	-	-	-	-
Disability (3B)	(572)	(3,303)	(3,875)	(183)	(723)	(906)	(4,781)
Other Retirement	(1,455)	(2,371)	(3,826)	(159)	(234)	(393)	(4,219)
Deceased	<u>(31)</u>	<u>(98)</u>	<u>(129)</u>	<u>(3)</u>	<u>(7)</u>	<u>(10)</u>	<u>(139)</u>
Subtotal	(2,058)	(5,772)	(7,830)	(345)	(964)	(1,309)	(9,139)
As at 31 March 2019	14,076	43,645	57,721	3,344	7,205	10,549	68,270

Table 13 Reconciliation of Pensioners

	Male			Female			Grand Total
	Officer	Other Rank	Total	Officer	Other Rank	Total	
<b><u>Retirement Pensioners</u></b>							
As at 31 March 2016	13,443	40,990	54,433	864	2,713	3,577	58,010
Data Corrections	609	(625)	(16)	36	(206)	(170)	(186)
New Pensioners	690	1,867	2,557	101	323	424	2,981
Rehired / Pensioners	(767)	(2,669)	(3,436)	(26)	(37)	(63)	(3,499)
Deceased	<u>(33)</u>	<u>(107)</u>	<u>(140)</u>	<u>(7)</u>	<u>(11)</u>	<u>(18)</u>	<u>(158)</u>
As at 31 March 2019	13,942	39,456	53,398	968	2,782	3,750	57,148
<b><u>Disability Pensioners (3A)</u></b>							
As at 31 March 2016	56	418	474	15	62	77	551
Data Corrections	(101)	(788)	(889)	(11)	(88)	(99)	(988)
New Pensioners	90	766	856	11	84	95	951
Rehired / Pensioners	(6)	(53)	(59)	(2)	(3)	(5)	(64)
Deceased	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>
As at 31 March 2019	39	343	382	13	55	68	450
<b><u>Disability Pensioners (3B)</u></b>							
As at 31 March 2016	1,223	12,518	13,741	285	2,094	2,379	16,120
Data Corrections	460	2,160	2,620	126	475	601	3,221
New Pensioners	107	952	1,059	44	198	242	1,301
Rehired / Pensioners	(20)	(360)	(380)	(2)	(17)	(19)	(399)
Deceased	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>
As at 31 March 2019	1,770	15,270	17,040	453	2,750	3,203	20,243

**Table 14 Non-Elective Officers**  
As at 31 March 2019

Age <sup>1</sup>	Number			Basic Benefit (\$ thousands)		
	Male	Female	Total	Male	Female	Grand Total
15-19	406	122	528	22,257	6,544	28,801
20-24	1,455	348	1,803	124,619	30,420	155,039
25-29	2,130	569	2,699	313,377	84,324	397,701
30-34	2,345	614	2,959	432,092	117,759	549,850
35-39	2,193	629	2,822	457,988	128,642	586,630
40-44	1,885	484	2,369	429,869	107,517	537,386
45-49	1,591	291	1,882	379,511	69,428	448,939
50-54	1,351	213	1,564	332,627	54,419	387,046
55-59	720	74	794	180,386	18,391	198,777
<b>Total</b>	<b>14,076</b>	<b>3,344</b>	<b>17,420</b>	<b>2,672,724</b>	<b>617,444</b>	<b>3,290,167</b>

**Table 15 Summary - Non-Elective Officers**

	Average	Male	Female	Total
As at 31 March 2016	Age <sup>1</sup>	38.1	35.9	37.7
	Service <sup>1</sup>	15.1	12.7	14.7
	Basic Benefit (\$)	183,608	179,247	182,856
As at 31 March 2019	Age <sup>1</sup>	37.3	35.6	37.0
	Service <sup>1</sup>	14.2	12.2	13.8
	Basic Benefit (\$)	189,864	184,642	188,862

<sup>1</sup> Expressed in completed years calculated at the beginning of the plan year.

**Table 16 Non-Elective Other Ranks**  
As at 31 March 2019

Age <sup>1</sup>	Number			Basic Benefit (\$ thousands)		
	Male	Female	Total	Male	Female	Grand Total
15-19	880	86	966	66,963	6,413	73,376
20-24	6,649	770	7,419	663,568	74,641	738,209
25-29	9,064	1,389	10,453	1,087,765	157,962	1,245,727
30-34	8,781	1,364	10,145	1,162,932	169,137	1,332,069
35-39	6,893	1,235	8,128	971,692	163,603	1,135,296
40-44	4,719	949	5,668	693,508	130,258	823,765
45-49	3,321	737	4,058	512,744	106,825	619,569
50-54	2,383	494	2,877	382,105	73,565	455,670
55-59	955	181	1,136	150,332	26,811	177,143
Total	43,645	7,205	50,850	5,691,609	909,215	6,600,822

**Table 17 Summary - Non-Elective Other ranks**

	Average	Male	Female	Total
As at 31 March 2016	Age <sup>1</sup>	34.6	36.6	34.9
	Service <sup>1</sup>	11.7	10.9	11.6
	Basic Benefit (\$)	123,560	120,970	123,213
As at 31 March 2019	Age <sup>1</sup>	34.3	36.0	34.6
	Service <sup>1</sup>	11.2	10.3	11.1
	Basic Benefit (\$)	130,406	126,190	129,809

<sup>1</sup> Expressed in completed years calculated at the beginning of the plan year.

**Table 18 Elective Disabled (3A) Participants**  
As at 31 March 2019

Age <sup>1</sup>	Number			Term and Paid-up Insurance (\$ thousands)		
	Male	Female	Total	Male	Female	Grand Total
40-44	1	1	2	-	-	243
45-49	5	2	7	630	204	834
50-54	21	9	30	2,097	810	2,907
55-59	56	23	79	5,006	2,024	7,029
60-64	55	14	69	4,074	910	4,984
65-69	29	12	41	582	365	947
70-74	35	6	41	175	30	205
75-79	40	-	40	200	-	200
80-84	57	-	57	285	-	285
85-89	60	-	60	300	-	300
90-94	21	1	22	105	5	110
95-99	<u>2</u>	<u>-</u>	<u>2</u>	<u>10</u>	<u>-</u>	<u>10</u>
<b>Total</b>	<b>382</b>	<b>68</b>	<b>450</b>	<b>13,575</b>	<b>4,480</b>	<b>18,054</b>

**Table 19 Summary - Elective Disabled (3A) Participants**

	Average	Male	Female	Total
As at 31 March 2016	Age <sup>1</sup>	70.7	58.7	69.0
	Term and Paid-up Insurance (\$)	38,172	74,116	43,195
As at 31 March 2019	Age <sup>1</sup>	72.6	61.0	70.8
	Term and Paid-up Insurance (\$)	35,534	65,885	40,120

<sup>1</sup> Expressed in completed years calculated at the beginning of the plan year.

**Table 20 Elective Retired and Disabled (3B) Participant**  
As at 31 March 2019

Age <sup>1</sup>	Number			Term and Paid-up Insurance (\$ thousands)		
	Male	Female	Total	Male	Female	Grand Total
20-24	8	2	10	823	161	984
25-29	31	6	37	4,014	751	4,765
30-34	402	62	464	53,541	8,379	61,920
35-39	969	203	1,172	132,649	29,459	162,108
40-44	1,691	339	2,030	255,972	55,035	311,006
45-49	3,961	735	4,696	593,604	109,530	703,134
50-54	7,668	1,248	8,916	1,110,614	177,384	1,287,997
55-59	12,967	1,936	14,903	1,772,395	244,169	2,016,564
60-64	10,404	1,386	11,790	1,101,789	131,023	1,232,813
65-69	7,035	561	7,596	254,399	21,520	275,919
70-74	7,579	253	7,832	37,895	1,265	39,160
75-79	7,157	119	7,276	35,785	595	36,380
80-84	5,989	57	6,046	29,945	285	30,230
85-89	3,256	25	3,281	16,280	125	16,405
90-94	1,031	14	1,045	5,155	70	5,225
95-99	269	6	275	1,345	30	1,375
100+	<u>21</u>	<u>1</u>	<u>22</u>	<u>105</u>	<u>5</u>	<u>110</u>
<b>Total</b>	<b>70,438</b>	<b>6,953</b>	<b>77,391</b>	<b>5,406,311</b>	<b>779,784</b>	<b>6,186,095</b>

**Table 21 Summary - Elective Retired and Disabled (3B) Participants**

	Average	Male	Female	Total
As at 31 March 2016	Age <sup>1</sup>	64.6	55.8	63.9
	Term and Paid-up Insurance (\$)	72,475	109,125	75,420
As at 31 March 2019	Age <sup>1</sup>	65.2	57.1	64.4
	Term and Paid-up Insurance (\$)	76,753	112,151	79,933

**Table 22 Elective Participants Entitled to a Deferred Annuity<sup>2</sup>**

Number	Term Insurance Benefit (\$ thousands)
4	4,072

<sup>1</sup> Expressed in completed years calculated at the beginning of the plan year.

<sup>2</sup> Due to their negligible effect on costs and liabilities, these participants were not taken into consideration for the purpose of this valuation.

## Appendix D — Methodology

### D.1 RFDB Account Balance

The account balance available for benefits of the plan consists essentially of the recorded balance in the RFDB Account, which forms part of the Accounts of Canada. The account records the transactions for the plan, meaning that no debt instrument has been issued to the RFDB Account by the government in recognition of the amounts therein. The recorded balance is shown at the book value of the underlying notional bond portfolio described in Appendix A.

The RFDB Account balance corresponds to the cumulative historical excess of contributions and interest credits over past benefit payments. The RFDB Account balance is projected to the end of a given plan year by adding to the RFDB Account balance at the beginning of that plan year the net income (i.e. the excess of contributions and interest credits over benefits) projected as described below for that plan year. Administration expenses are ignored because they are not debited from the RFDB Account.

### D.2 Contributions

#### D.2.1 Participants

Participants' annual contributions are projected for a given plan year by multiplying

- the legislated annual contribution rate of 60 cents per \$250 of salary (equivalent to the monthly rate of 5 cents per \$250 of salary)

by

- the projected participants' rounded salaries for that plan year on an open-group basis, reduced by 10% per year from age 61, if applicable, (the legislation expresses the annual reduction of 10% per year on the total amount of coverage)

less

- \$6.00 annually corresponding to the \$5,000 paid-up coverage after age 65, if applicable (i.e. death benefit coverage of \$5,000 corresponds to an annual salary of \$2,500, hence an annual contribution of 60 cents per \$250 of salary would produce a contribution of \$6.00 annually).

Non-elective participants' salaries are projected for a given plan year using the assumed rates of increase described in Appendix D and by the assumed seniority and promotional salary increases given in Table 24. Elective participants' salaries are frozen at time of retirement or disability and are not subject to further increases.

#### D.2.2 Government

The government's annual contribution is projected for a given plan year as the sum of

- one-twelfth of the amount of term insurance death benefits projected to be paid during that plan year, and
- the legislated single premiums in respect of relevant participants 65 years of age.

### **D.3 Discount Rates**

The rates used to calculate the present value of benefits in respect of paid-up death benefit are the same as the yields described and shown in Appendix D.

### **D.4 Interest Credits**

Annual interest credits are projected for a given plan year as the product of the yield projected for that plan year (Appendix E) and the projected average RFDB Account balance in that plan year.

### **D.5 Benefit Payments**

The total amount of annual benefits (term and paid-up insurance) for a given plan year is projected as the sum of the participant annual benefits in force during that plan year multiplied by the mortality rates applicable to each participant during that plan year. The amount of annual benefit in force depends on the salary projected to time of death. Elective participants' salaries are frozen at time of retirement or disability and are not subject to further increases. Salaries are projected for this purpose using the assumed rates of increase in salaries and the number of participants projected on an open-group basis as described in Appendix F.

### **D.6 Liabilities**

#### **D.6.1 Paid-up Reserve**

At the end of a given plan year, the liabilities associated with the individual \$5,000 paid-up death benefit in force correspond to the amount which, together with interest at the projected yields, is sufficient to pay for each individual \$5,000 paid-up death benefit projected payable on the basis of the assumed mortality rates. With the exception of elective participants entitled to a deferred annuity, this valuation assumes that the paid-up benefit of \$5,000 will be paid to all elective participants when it becomes available to them.

#### **D.6.2 IBNR and Pending Claims Reserves**

On the basis of the plan's experience, the reserve at the end of a given plan year for claims incurred but not reported (IBNR) and for pending claims is set equal to one-sixth of the projected annual death benefits paid on average during the six previous plan years.

#### **D.6.3 Extension of Coverage**

Due to the negligible financial impact of the 30-day extension of the basic benefit upon termination of coverage and to the nature of basic benefit paid on a monthly basis, no explicit liability was calculated in respect of that basic benefit provision.



## Appendix E — Economic Assumptions

The following economic assumptions are required for valuation purposes:

### E.1 Increases in Average Earnings

Average earnings are exclusive of seniority and promotional increases, which are considered under a separate demographic assumption. The annual increase in average earnings is assumed to be 0.3% lower than the corresponding increase in the Yearly Maximum Pension Earnings (same assumption as in the previous valuation) except for the first three years which were provided by the Department of National Defence. The determination of the expected increases in the Yearly Maximum Pension Earnings is provided in Appendix F of the Report on the Pension Plans for the Canadian Forces - Regular Force and Reserve Force as at 31 March 2019 prepared by Office of the Chief Actuary. The ultimate nominal increase in average earnings of 2.7% is effective from plan year 2026 (2.8% in the previous valuation and effective from plan year 2024).

The resulting assumed increases in average earnings are shown in Table 23.

### E.2 Projected Yields on RFDB Account

These yields are required for the long-term projection of the RFDB Account balance, liabilities and excess or shortfall. The methodology used to determine the projected yields on the Superannuation Account is described in Appendix E of the Report on the Pension Plans for the Canadian Forces - Regular Force and Reserve Force as at 31 March 2019 prepared by Office of the Chief Actuary. It is unchanged from previous valuations. Since the real projected yields are based on the real yields on 10-year-plus federal bonds, they are projected to be lower than assumed in the previous valuation (the ultimate projected yield is 0.2% lower than in the previous valuation, reaching 4.5% in plan year 2053).

**Table 23 Summary of Economic Assumption**  
(percentage)

Plan Year	Average Earnings <sup>1</sup> of Non-Elective Participants	Projected Yield
2020	1.9	3.7
2021	2.0	3.5
2022	1.9	3.3
2023	2.4	3.2
2024	2.5	3.1
2025	2.6	3.0
2026	2.7	2.9
2027	2.7	2.8
2028	2.7	2.7
2029	2.7	2.6
2030	2.7	2.6
2031	2.7	2.5
2032	2.7	2.4
2033	2.7	2.5
2034	2.7	2.5
2035	2.7	2.5
2036	2.7	2.5
2037	2.7	2.6
2038	2.7	2.7
2039	2.7	2.8
2040	2.7	3.0
2041	2.7	3.2
2042	2.7	3.4
2043	2.7	3.7
2044	2.7	3.9
2045	2.7	3.9
2046	2.7	3.9
2047	2.7	4.0
2048	2.7	4.0
2049	2.7	4.1
2050	2.7	4.1
2051	2.7	4.2
2052	2.7	4.4
2053+	2.7	4.5

<sup>1</sup> Exclusive of seniority and promotional increases.

## Appendix F — Demographic and Other Assumptions

### F.1 Demographic Assumptions

Except where otherwise noted, all demographic assumptions were determined from the Canadian Forces - Regular Force plan's experience as it was done in the past. Where applicable, assumptions of the previous valuation were updated to reflect the intervaluation experience. For detailed descriptions on each assumption, please refer to the Actuarial Report on the Pension Plans for Canadian Forces - Regular Force and Reserve Force as at 31 March 2019.

**Table 24 Sample of Assumed Seniority and Promotional Salary Increases**  
(Percentage of annual earnings)

Completed Years of Qualifying Service	Officer	Other Rank	Completed Years of Qualifying Service	Officer	Other Rank
0	7.9	20.3	10	3.8	0.8
1	8.2	17.9	11	3.7	0.9
2	15.9	5.4	12	3.4	1.0
3	25.8	9.4	13	3.0	1.1
4	11.6	2.6	14	2.7	1.2
5	7.1	2.1	15	2.4	1.2
6	7.5	1.8	20	2.0	1.2
7	5.2	1.5	25	1.7	1.2
8	4.3	1.0	30	1.3	0.9
9	4.0	0.8	40	0.5	0.5

**Table 25 Sample of Assumed Withdrawal Rates - Regular Force Plan - Old Terms of Service**  
(Per 1,000 individuals)

Completed Years of Qualifying Service	Officer		Other Rank	
	Male	Female	Male	Female
0	66	60	106	71
1	28	25	27	17
5	14	19	42	22
10	25	14	21	19
15	13	10	12	11
18	14	12	15	16
19	-	-	-	-

**Table 26 Sample of Assumed Withdrawal Rates - Regular Force Plan - New Terms of Service**  
(Per 1,000 individuals)

Completed Years of Qualifying Service	Officer		Other Rank	
	Male	Female	Male	Female
0	68	64	106	74
1	27	22	26	14
5	14	19	43	21
10	25	13	21	20
15	12	9	13	11
20	11	28	26	18
23	41	46	35	51

**Table 27 Sample of Assumed Rates of Retirement - Regular Force Plan - Old Terms of Service**  
(Per 1,000 individuals)

Completed Years of Qualifying Service	Officer		Other Rank	
	Male	Female	Male	Female
19	69	53	50	28
20	71	59	49	28
21	59	62	49	40
22	62	69	41	43
23	57	70	43	59
24	90	88	67	62
25	90	93	78	72
30	101	114	100	88
35	330	145	255	278
40	330	145	270	278

**Table 28 Sample of Assumed Rates of Retirement - Regular Force Plan - New Terms of Service**  
(Per 1,000 individuals)

Completed Years of Qualifying Service	Officer		Other Rank	
	Male	Female	Male	Female
24	97	71	62	60
25	90	91	79	76
26	88	108	71	61
27	85	79	72	73
28	78	96	79	82
29	97	106	100	92
30	100	116	101	81
31	116	117	84	86
35	347	229	262	493
40	347	229	383	493

**Table 29 Sample of Assumed 3B Disability Incidence Rates (Own Occupation)**  
(Per 1,000 individuals)

Completed Years of Qualifying Service	Male Officer	Male Other Rank	Female
1	0.7	2.6	7.6
5	4.0	9.8	11.7
10	8.2	31.5	34.7
15	10.0	34.8	45.3
20	18.1	60.5	63.6
25	22.0	67.3	87.7
30	33.9	82.9	124.4
35	78.0	137.0	158.5

**Table 30 Sample of Assumed Rates of Mortality**  
Plan Year 2020  
(Per 1,000 individuals)

Age Last Birthday	Contributors and Retirement Pensioners			Disability (3A) Pensioners		
	Male		Female	Male		
	Officer	Other Rank		Officer	Other Rank	Female
30	0.4	0.6	0.3	0.5	2.9	0.4
40	0.5	0.8	0.4	0.9	3.9	0.9
50	0.7	2.2	1.2	6.0	6.9	2.5
60	2.2	6.1	3.4	13.2	12.9	6.1
70	8.7	18.2	10.5	24.1	27.2	15.2
80	41.4	51.8	31.7	56.1	62.2	41.0
90	146.3	168.8	101.2	128.6	156.6	115.8
100	330.9	366.5	276.5	298.9	323.6	274.5
110	500.0	500.0	500.0	500.0	500.0	500.0

**Table 31 Sample of Assumed Longevity Improvement Factors**  
(applicable at the end of the plan year)

Age Last Birthday	Initial and Ultimate Plan Year Mortality Reductions (%)			
	Male		Female	
	2021	2037+	2021	2037+
30	1.14	0.80	0.65	0.80
40	1.55	0.80	1.40	0.80
50	1.52	0.80	1.01	0.80
60	2.22	0.80	1.69	0.80
70	2.07	0.80	1.48	0.80
80	2.08	0.80	1.52	0.80
90	1.78	0.62	1.62	0.62
100	0.59	0.28	0.63	0.28
110	0.00	0.00	0.00	0.00

## F.2 Other Assumptions

### F.2.1 New Participant

It is assumed that the distribution of new members by age and sex will be the same as that of members with less than one year of service at the valuation date, and that the number of new participants will be such that the total number of participants remains constant over the projection period.

### F.2.2 Non-Elective Participants Choosing to Become Elective Participants at Retirement

The assumed proportion of new retirees choosing to continue their coverage under the SDB plan was derived from the plan's own experience. These assumed proportions remain unchanged and are shown in Table 32.

**Table 32 Sample of Assumed Proportions of non-elective participants choosing to become elective participants at retirement**  
 (per 1,000 individuals)

Service <sup>2</sup>	Pensionable Retirement <sup>1</sup>		Disability Retirement	
	Officer	Other Rank	Officer	Other Rank
19	850	860	1,000	1,000
20	850	850	1,000	1,000
21	840	850	1,000	1,000
22	840	840	1,000	1,000
23	830	840	1,000	1,000
24	830	840	1,000	1,000
25	820	840	1,000	1,000
26	820	840	1,000	1,000
27	810	840	1,000	1,000
28	810	840	1,000	1,000
29	810	840	1,000	1,000
30	810	840	1,000	1,000
31	810	840	1,000	1,000
32	810	840	1,000	1,000
33	810	840	1,000	1,000
34	820	850	1,000	1,000
35+	820	850	1,000	1,000

### F.2.3 Option to Reduce Coverage to \$5,000

The valuation data indicates that the proportion of elective participants opting to reduce their basic benefit to \$5,000 is negligible. Accordingly, no elective participants were assumed to make such an option.

<sup>1</sup> A pensionable retirement is a retirement resulting in either an immediate annuity for reasons other than disability or an annual allowance.

<sup>2</sup> Expressed in completed years calculated at the beginning of the plan year.

#### **F.2.4 Administrative Expenses**

In the projection of the RFDB Account, no assumption was made regarding the expenses incurred for the administration of the plan. These expenses, which are not debited from the RFDB Account, are commingled with all other government charges.

## Appendix G — Acknowledgements

The Public Services and Procurement Canada provided all relevant valuation data on plan participants.

The co-operation and able assistance received from the above-mentioned data provider deserve to be acknowledged.

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