PBI ACTUARIES & CONSULTANTS

Report on the Actuarial Valuation

as of January 1, 2018

Telecommunication Workers Pension Plan

Canada Revenue Agency
Registration Number 0397935

Office of the Superintendent of
Financial Institutions Canada
Registration Number 55745

June 27, 2018

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Executive summary

Purpose

At the request of the Trustees of the Telecommunication Workers Pension Plan (the "Plan"), we have prepared this report, which presents the results of an actuarial valuation performed on the Plan as at January 1, 2018. The purposes of this actuarial valuation were:

(i) to determine the financial position of the Plan as at January 1, 2018 and determine the adequacy of the current negotiated contributions;

(ii) to determine the solvency position of the Plan as at January 1, 2018, including any solvency deficiency and the solvency ratio as required under the Pension Benefits Standards Act, 1985 (the "PBSA-85") and Regulations thereto;

(iii) to analyze the experience of the Plan since the date of the last actuarial valuation, January 1, 2015;

(iv) to estimate the additional actuarial liabilities as at January 1, 2018 if the accrued pension benefit credits of active and disabled participants were updated to reflect more current earnings at each of January 1, 2019, 2020 and 2021 and if the target level of indexation to pensions in payment, defined in the Plan's Funding Policy as 25% of the increase in the Consumer Price Index, is granted at each of April 1, 2019, 2020 and 2021; and

(v) to provide information required for the ongoing administration of the Plan.

The results of our current actuarial valuation, the basis on which it was made and the results of the prior actuarial valuation, are set forth in the following pages of this report. This report outlines the evolution of the Plan's financial situation since the prior actuarial valuation at January 1, 2015 and is designed to be filed with the Office of the Superintendent of Financial Institutions Canada ("OSFI") in order to maintain Plan registration under the PBSA-85, with the Canada Revenue Agency ("CRA") in order to maintain plan registration under the *Income Tax Act (Canada)* and Regulations thereto and to be used by the Plan administrator in the administration of the Plan.

It is intended that this report will be used by the Trustees of the Telecommunication Workers Pension Plan, the Telecommunications Workers Union (TWU) United Steelworkers Local Union 1944, TELUS, OSFI, CRA, Strategic Income Security Services Ltd. and Smythe LLP, for the purposes stated above. The report has not been prepared in contemplation of reliance by any parties other than these specifically named parties. Therefore, items of relevance for other purposes and of possible interest to other parties have not been specifically addressed, and matters may exist that would be assessed differently for a different purpose or different user of the report. If the listed users of the report wish to use the report for a purpose that is not stated in the report, then PBI Actuarial Consultants Ltd.'s approval for the intended use should be sought. If any other party wishes to use the report for any purpose, the approval of the Trustees must be obtained, and PBI Actuarial Consultants Ltd.'s prior consent must be obtained before such party makes use of the report.

The numbers in this report are rounded to the nearest $1,000, where noted with "(in 000's)."

Terms of Appropriate Engagement

The terms of engagement with respect to the preparation of this actuarial valuation include:

- This actuarial valuation includes a review of the Plan's going concern and solvency position as at January 1, 2018 and must be filed with OSFI and CRA;
- The going concern financial position is to be determined using the Aggregate Actuarial Cost Method;
- The minimum funding requirements are to be determined using the Traditional Unit Credit Actuarial Cost Method;
- For the purpose of the going concern actuarial valuation, a provision for adverse deviation should be included in the actuarial valuation interest rate and the mortality table, as described in Section 6A; and
- For the purpose of the going concern actuarial valuation, the going concern value of assets is to be determined using the market value of assets as described in Section 6A.

Significant Events Occurring during the Intervaluation Period

a) The Trustees adopted resolutions to implement a benefit update at January 1, 2016, January 1, 2017 and January 1, 2018 in respect of active and disabled participants. The cost calculations with respect to the benefit updates are included in the actuarial valuation as at January 1, 2018.

b) The Trustees adopted a resolution to implement a 3.50% increase effective April 1, 2018 for benefits in payment in respect of members who retired on or prior to January 1, 2010. The 3.50% increase will be prorated on a monthly basis for members who retired between January 2, 2010 and December 31, 2016. The estimated cost of providing this increase has been included in the actuarial valuation as at January 1, 2018.

c) During the years 2015 and 2016, the Voluntary Departure Incentive Program ("VDIP") and the Early Retirement Incentive Program ("ERIP"), as pursuant to the Collective Agreement ratified in 2011, offered incentives to Plan participants, who met certain criteria, to terminate or retire as applicable, under programs known as "ERIP/VDIP".

   Participants who elected the "ERIP-Equivalent" incentive are entitled to the benefits of a Former Participant under the Plan. If they elect to retire early and they receive the consent of the Trustees, they will be entitled to a subsidized early retirement pension. Participants who elected the "VDIP" incentive are called Incented Terminated Participants under the Plan, and are only entitled upon early retirement to the actuarial equivalent of their deferred retirement benefit payable as of their normal retirement date.

   The Plan Administrator's office has confirmed that in 2015 and 2016 there were 322 participants who elected to retire under the ERIP and 129 participants who elected to terminate under the VDIP, of which 102 participants elected the ERIP-Equivalent incentive and 27 participants elected the VDIP incentive.

   The Company and the Union agreed that the Company would make additional contributions to the Plan as a result of the implementation of the ERIP/VDIP programs in 2005. The Collective Agreement ratified in 2011 specifies how the amount of Company contributions is to be determined. The Company made contributions of $17.36 million with respect to 2015 participants and $11.94 million with respect to 2016 participants. As per the Collective Agreement effective January 1, 2016, the Company remitted a lump sum contribution in the amount of $32.50 million in December 2016 to cover an expected 500 ERIP/VDIP packages the Company expects to offer in the 5 year period starting December 31, 2016.

Highlights

A) Actuarial Valuation Results

The principal results of the current actuarial valuation and comparative figures from the prior actuarial valuation are set out in the table below.

	January 1, 2018 (in 000's)	January 1, 2015 (in 000's)
Assets of the Plan		
Market value of assets	$ 4,673,350	$ 4,228,728
Actuarial value of assets	4,673,351	4,228,818
Average net annual return on market value of assets since last actuarial valuation date (geometric)	6.8%	19.8%
Funded Position – Going Concern		
Actuarial value of assets (A)	$ 4,673,351	$ 4,228,818
Actuarial liabilities for accrued benefits (L)	3,636,129	3,536,397
Excess of actuarial value of assets over actuarial liabilities for accrued benefits (A) - (L)	1,037,222	692,421
Funded ratio (A) ÷ (L)	1.29	1.20
Funded Position – Solvency		
Market value of assets plus receivable	$ 4,673,350	$ 4,228,728
Allowance for Plan windup expenses	(2,658)	(2,000)
Solvency assets (SA) (market value of assets less windup expenses)	$ 4,670,692	$ 4,226,728
Solvency liabilities (SL)	3,817,290	3,505,208
Solvency position (SA) / (SL)	$ 853,402	$ 721,520
Solvency ratio (SA) ÷ (SL)	not less than 1.0 (1.22)	not less than 1.0 (1.21)

B) Minimum Funding Requirements

We show below the required minimum funding of the Plan in the twelve months following the actuarial valuation date as determined in accordance with the requirements of the PBSA-85. This was calculated using the Unit Credit Actuarial Cost method, and was derived after having taken into account the effect of the ERIP/VDIP. The numbers are expressed as a percentage of earnings.

	January 1, 2018	January 1, 2015
Normal Cost	16.68%	17.95%
Allowance for non-investment related expenses (included in the interest rate in current valuation)	0.00%	0.89%
Total required minimum funding	16.68%	18.84%

We estimate that participants will contribute approximately 4.79% of their earnings in 2018. As noted below, the Employer will contribute 10.00% of member earnings. The total contributions to be remitted to the Plan in 2018 are therefore expected to be approximately 14.79% of earnings, which is less than the minimum funding requirement. The estimated total negotiated contributions in 2018, 2019 and 2020 will be less than the required minimum funding contributions by approximately $12.7 million. However, as the actuarial value of assets exceed the accrued actuarial liabilities by $1,037.2 million, the minimum funding requirements can be met.

C) Negotiated Contributions

	January 1, 2018	January 1, 2015
Required regular Employer contributions in accordance with the existing collective agreement in effect at the actuarial valuation date expressed as a percentage of Bargaining Unit Employees' gross earnings	10.00%	Same
Required Employee contributions in accordance with the existing collective agreement in effect at the actuarial valuation date expressed as percentage of gross earnings	Under 30 – 3% 30 - 39 – 4% 40 - 49 – 5% 50 and over – 6%	Same

D) Maximum Employer Contributions

We show below the maximum Employer contributions as permitted under the *Income Tax Act (Canada)* for the four years following the actuarial valuation date.

	2018	2019	2020	2021
Employer maximum contribution as a percentage of covered earnings	16.54%	15.92%	15.32%	14.74%
Estimated Employer maximum contribution (in 000's)	$45,351	$44,961	$44,564	$44,163

E) Summary of Data Employed in the Actuarial Valuation

Both the non-retired participant data and the retired participant data were based on the records maintained under the Plan as at January 1, 2018 and obtained from the Plan Administrator.

A summary of the data is set forth below (and compared with the January 1, 2015 data) and a more detailed description of the data used is set forth in Section 8.

Number of Participants, Beneficiaries and Survivors

	January 1, 2018	January 1, 2015
Active Participants		
• Males	2,243	2,417
• Females	1,275	1,609
Total	3,518	4,026
Disabled Participants		
• Males	94	111
• Females	178	184
Total	272	295
Former Participants		
Terminated Vested:[1]		
• Males	659	617
• Females	1,222	1,380
Total	1,881	1,997
Transferred to Management:		
• Males	380	375
• Females	334	312
Total	714	687
Retired Participants[2]		
• Males	4,486	4,223
• Females	3,903	3,496
Total	8,389	7,719
Beneficiaries		
• Males	4	4
• Females	3	5
Total	7	9
Survivors		
• Males	123	91
• Females	621	534
Total	744	625
Total	**15,525**	**15,358**

1 Including pending terminations and multi-service records for actuarial valuation purposes.

2 Including Limited Members.

Membership Data Statistics

	January 1, 2018	January 1, 2015
Active Participants		
Average Years of Accrued Membership Service:[1]		
• Males	12.5	15.1
• Females	12.9	14.4
Combined	12.6	14.8
Average Annual Pensionable Earnings:[2]		
• Males	$ 73,332	$ 74,293
• Females	63,116	61,422
Combined	$ 69,630	$ 69,149
Average Age:[3]		
• Males	42.7	44.1
• Females	42.7	43.5
Combined	42.7	43.9
Disabled Participants		
• Males and Females Combined		
Average Age[3]	53.5	53.3
Retired Participants[4]		
• Males and Females Combined		
Annual Retirement Benefit	$ 195,607,356	$ 174,456,792
Average Annual Benefit	$ 23,316[5]	$ 22,601
Average Age[3]	69.5	68.6
Beneficiaries		
• Males and Females Combined		
Annual Benefit	$ 189,156	$ 238,536
Average Annual Benefit	$ 27,024[5]	$ 26,504
Average Age[3]	66.0	64.0
Survivors		
• Males and Females Combined		
Annual Benefit	$ 10,833,348	$ 8,524,452
Average Annual Benefit	$ 14,556[5]	$ 13,639
Average Age[3]	74.5	72.9

1 Includes Supplemental and Purchased Service.

2 Annualized pensionable earnings in the year prior to the actuarial valuation date increased by 3%, and further adjusted by the ratio of expected variable pay of 5% over the average variable pay in the year prior to the actuarial valuation date.

3 Age is calculated to be age nearest birthday at actuarial valuation date.

4 Includes Limited Members.

5 Including increase at April 1, 2018.

F) Results of Cost Calculations in respect of potential benefit improvements

In the same manner as has been done in past valuations, we calculated the estimated cost (i.e. increase in actuarial liabilities) that would result if pension benefit credits of active and disabled participants are updated as of January 1, 2019, 2020 and 2021 and if the target level of indexation to pensions in payment, defined in the Plan's Funding Policy as 25% of the increase in the Consumer Price Index, is granted at each of April 1, 2019, 2020 and 2021. The estimated costs are shown below:

	January 1, 2018 (in 000's)
a) if the active and disabled participants' pension benefit credits are updated at January 1, 2019, 2020 and 2021 respectively, the estimated additional accrued actuarial liabilities under the Plan as at January 1, 2018, and assuming accrued benefits will be updated each year up to:	
• January 1, 2019 and no further updating thereafter	$ 6,903
• January 1, 2020 and no further updating thereafter	$ 13,194
• January 1, 2021 and no further updating thereafter	$ 17,085
b) if the participants' benefits in payment are increased at April 1, 2019, 2020 and 2021 respectively, the estimated additional accrued actuarial liabilities under the Plan as at January 1, 2018, and assuming benefits in payment will be updated each year up to:	
• April 1, 2019 and no further updating thereafter	$ 13,290
• April 1, 2020 and no further updating thereafter	$ 26,103
• April 1, 2021 and no further updating thereafter	$ 38,382
c) estimated funded position at January 1, 2018 after allowing the improvements described in (a) and (b) above (i.e. updates through to January 1, 2021 and April 1, 2021)	
• Funded ratio on going concern basis	1.27
• Solvency ratio	1.21

Discussion

Assets and Interest Assumption

As with our last actuarial valuation, the actuarial value of assets for this actuarial valuation was set equal to the market value of assets adjusted for benefits and expenses due and unpaid and contributions in transit.

In our last actuarial valuation, the future investment earnings, net of investment expenses, was assumed to be 3.95% per annum. We have employed an assumed rate of return, net of both investment and non-investment expenses, of 4.10% per annum for purposes of our current actuarial valuation. This increase in interest rate has resulted in a decrease in accrued liabilities at January 1, 2018 of approximately $63.3 million. The basis for adopting a 4.10% actuarial valuation rate is discussed in Section 6A.

In the last three years prior to the current actuarial valuation date, the Fund earned an annual net rate of return, on a market value basis, of 6.8% compared to the 3.95% per annum net rate of return assumed in our prior actuarial valuation. After taking cashflows over the three year period into account, this has resulted in an experience gain of approximately $374.0 million.

Funded Position – Going Concern

At our last actuarial valuation the actuarial value of assets exceeded the actuarial liability for accrued benefits by approximately $692.4 million. Our current actuarial valuation indicates that the actuarial value of assets exceed the accrued actuarial liability as at January 1, 2018 by approximately $1,037.2 million, based on the revised actuarial valuation assumptions.

A detailed analysis of the factors affecting the funded position is set forth in Section 5 of this report.

Funded Position – Solvency and Windup

The solvency position was determined using the method prescribed in the PBSA-85 and guidance from the Canadian Institute of Actuaries Education Note: Alternative Settlement Methods for Hypothetical Wind-Up and Solvency Valuations. Results on this method are reported in Section 2B. Assumptions and methods are reported in Section 6B. On this prescribed method, we have determined that the Plan does not have a solvency deficiency at the actuarial valuation date and that the solvency ratio is not less than 1.0 (actual ratio equals 1.22) at the current actuarial valuation date.

If the Plan had been terminated at January 1, 2018 the market value of assets plus receivables net of Plan windup expenses would have exceeded the actuarial liabilities and expenses by approximately $853.4 million.

Transfer Deficiency

The transfer deficiency, as defined by the PBSA-85, is nil for the Plan at January 1, 2018. As a result, no restrictions are required on the lump sum portability transfers which may be made from the Plan until a subsequent actuarial valuation determines otherwise.

Employer and Employee Contributions

i) Employers

The Employers contribute a percentage of the employees' gross earnings as prescribed by the Collective Agreement or Participation Agreement (the "Agreements").

Based on the Agreements, the Employers' contributions to the Pension Plan have been 10.00% of gross earnings since 2009. As noted earlier, the Company is required to make additional contributions as a result of the Company's ERIP/VDIP offered during the intervaluation period. The value of these additional contributions, for members known to be affected by the ERIP/VDIP prior to the actuarial valuation date, is included in our current going concern actuarial valuation.

The Employers are not required to guarantee the benefits to be provided under the Plan or to assure the solvency of the Plan.

ii) Employees

The Plan participants contributed 2% of gross earnings to the Plan prior to April 1, 1994 in accordance with the Agreements.

In accordance with the Agreements, the Plan participants have been contributing, since April 1, 1994, at rates based on their age as follows:

Under age 30	– 3% of gross earnings
Age 30 or older but under 40	– 4% of gross earnings
Age 40 or older but under 50	– 5% of gross earnings
Age 50 or over	– 6% of gross earnings

iii) The required regular Employer and Employee contributions described above are assumed to be paid monthly and assumed not to change in the future.

iv) The shortfall of Employer and Employee contributions compared to the actuarial liability for benefits credited to the Plan participants during the intervaluation period has resulted in a loss to the Plan of approximately $16.9 million based on the actuarial valuation assumptions at January 1, 2015. This shortfall was covered by the excess of the actuarial value of assets over accrued liabilities.

Plan Membership

Since the last actuarial valuation, the total Plan membership covering all categories has increased from 15,358 to 15,525, while active membership decreased from 4,026 to 3,518. The total Plan membership does not include 434 non-vested and untraced terminated vested participants who were entitled to the refund of their required contribution account. The required contribution account balance as at January 1, 2018 for the 434 participants was $0.3 million which was reflected in the accrued liabilities.

Plan Provisions

This actuarial valuation reflects the Plan provisions as at January 1, 2018.

Since the last actuarial valuation carried out as at January 1, 2015, the following amendments have had a material impact on the financial position of the Plan:

- benefit credits accrued to active and disabled participants have been updated at January 1, 2016, January 1, 2017 and January 1, 2018 to reflect more recent earnings history. These improvements created an additional actuarial liability for accrued benefits of approximately $47.3 million as at January 1, 2018 based on the actuarial valuation assumptions used for the January 1, 2015 actuarial valuation; and
- benefits in payment in respect of participants who retired on or before January 1, 2010 were increased by 3.50% effective April 1, 2018 (for those participants who retired between January 2, 2010 and December 31, 2016 the increase will be prorated on a monthly basis). These improvements created an additional actuarial liability for accrued benefits of approximately $66.3 million as at January 1, 2018 based on the actuarial valuation assumptions used for the January 1, 2018 actuarial valuation.

Other than these changes, there have been no changes to the Plan provisions which have had a material impact on the financial condition of the Plan.

A summary of the main Plan provisions is set out in Section 7 of this report.

Actuarial Basis

Since the last actuarial valuation, there were no changes to the actuarial cost method and asset valuation method.

The assumptions used in the solvency valuation have been updated to reflect market conditions at the actuarial valuation date as well as changes to how benefits will be provided upon plan termination. For retired members and 100% of other members eligible to retire immediately, it was assumed that the Trust would continue to pay out monthly pensions. In the previous actuarial valuation, it was assumed that only 50% of other members eligible to retire immediately would continue to receive a monthly pension from the Trust and the other 50% would receive a commuted value payment from the Plan.

In addition, there were changes to the going concern actuarial assumptions as below:

- the actuarial valuation interest rate has been increased to 4.10% per annum from 3.95% per annum;
- the non-investment expenses assumption has been changed to a reduction of the actuarial valuation interest rate of 0.07% per annum from an assumption of 6% of required Employee and Employer contributions;
- the size and adjustment factors for the mortality table for non-disabled participants have been removed and therefore it is assumed that mortality rates both pre- and post-retirement will follow the standard 2014CPM private sector table; and
- the mortality rates for disabled participants prior to retirement has been changed to follow those of the non-disabled participants from the blended table based on the UP94 Mortality Table and a special table of rates used in the January 1, 1993 actuarial valuation, which was based on Plan experience.

A summary of the actuarial basis for the going concern actuarial valuation appears in Section 6A.

A summary of the actuarial basis for the solvency valuation appears in Section 6B.

Government Filings

This report should be filed with OSFI as required pursuant to the PBSA-85 and with CRA pursuant to section 147.2(3) of the *Income Tax Act (Canada).*

Subsequent Events

We completed this actuarial valuation on June 27, 2018.

To the best of our knowledge and on the basis of our discussions with the Plan Administrator's Office, it is our understanding that there were no events which occurred between the actuarial valuation date and the date this actuarial valuation was completed which would have a material impact on the results of the actuarial valuation.

Conclusions

In our opinion, the actuarial valuation of the Plan as at January 1, 2018 indicates, on the basis of the assumptions used, that:

a) The assets together with future contributions and investment earnings on the Fund, will be sufficient to finance the benefits provided under the Plan. The funded ratio, as defined under the PBSA-85, is not less than 1.00 as at the actuarial valuation date;

b) There exists no solvency deficiency as defined under the PBSA-85 as at the actuarial valuation date. The solvency ratio is 1.22;

c) The contributions required to be made to the Fund by the Participants and the Employers pursuant to the Agreements, together with the excess of the actuarial value of assets over accrued liabilities at the actuarial valuation date, are estimated to be sufficient to meet the minimum funding requirements of the PBSA-85 for the period until the next scheduled actuarial valuation as of January 1, 2021; and

d) The financial condition of the Plan will allow the Trustees to update the benefit credits accrued to active and disabled participants as at January 1 of each of the next three years and grant increases to the benefits in payment equal to the target level of indexation, defined in the Plan's Funding Policy as 25% of the increase in the Consumer Price Index, as at April 1 of each of the next three year's starting with an increase at April 1, 2019. These updates will not jeopardize the financial position of the Plan provided that the actual Plan experience from January 1, 2018 to the date on which the update is granted does not vary significantly from that expected by the assumptions made in this report.

Actuarial Opinion

The report and opinions given herein apply for the four years following the actuarial valuation date. The next actuarial valuation of the Plan for the purposes stated in this report must be performed with an actuarial valuation date no later than January 1, 2021, as required by the PBSA-85.

This actuarial valuation was based on membership data and other supplemental information and statistics provided by the Plan Administrator as at January 1, 2018, together with the financial statements supplied by CIBC Mellon Global Securities Services Company and the audited financial statements prepared by Smythe LLP. We have reviewed the data to test for reasonableness and consistency with the data provided for the last actuarial valuation as at January 1, 2015 by the Plan Administrator.

In our opinion,

- the data on which the actuarial valuation is based is sufficient and reliable for the purposes of this actuarial valuation, which are stated at the beginning of this report;
- the assumptions are individually reasonable and appropriate in aggregate for the purposes of the going concern actuarial valuation and solvency valuation;
- the methods employed in this actuarial valuation are appropriate for the purposes of the going concern actuarial valuation and solvency valuation;
- the value of the Plan assets, net of windup expenses, would be greater than the actuarial liabilities if the Plan were to be wound up on the actuarial valuation date.

The required rate of Employer and Employee contributions provided for in the current Agreements and the assets of the Plan and future investment earnings thereon, should be adequate to provide the benefits accruing under the Plan. Nonetheless, emerging experience under the Plan differing from the assumptions will result in gains or losses which will be revealed in future actuarial valuations.

This report has been prepared and our opinions given in accordance with accepted actuarial practice in Canada. The actuarial valuations have been determined in accordance with the funding and solvency standards prescribed by the PBSA-85 and Regulation thereto and the requirements of the *Income Tax Act (Canada)* and Regulation thereto.

Respectfully submitted,
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Vancouver, BC
June 27, 2018

Section 1: Assets of the Plan

Growth of Pension Fund Assets

The Plan is funded under a trust agreement. The custodian of the assets of the Trust is CIBC Mellon Global Securities Services Company. The investment of the majority of assets are separately managed by two investment managers – Phillips, Hager and North Investment Management (an operating division of RBC Global Asset Management Inc.) and CIBC Asset Management Inc. The value of the assets of the Plan is derived from the audited reports prepared by the Plan's auditor, Smythe LLP.

During the period from January 1, 2015 to January 1, 2018, the Fund assets, as developed on an accrual basis, have evolved as follows:

	(in 000's)		
	2017	**2016**	**2015**
Market value at beginning of Plan year	$ 4,392,632	$ 4,357,107	$ 4,228,728
PLUS			
Contributions			
• Employer	$ 24,124	$ 72,201	$ 44,739
• Employee			
• Required	11,617	13,353	13,381
• Voluntary	534	479	467
Investment income	71,203	68,203	72,873
Change in market value of investment	381,619	89,888	191,839
Subtotal	$ 489,097	$ 244,124	$ 323,299
LESS			
Pension payments	$ 200,516	$ 199,319	$ 186,354
Termination payments	1,501	2,837	1,771
Death benefit payments	1,575	1,065	1,769
Return of employee Voluntary Contributions	204	491	279
Expenses • investment (directly charged)	1,919	2,031	2,037
• non-investment	2,664	2,856	2,710
Subtotal	$ 208,379	$ 208,599	$ 194,920
Market value at end of Plan year	$ 4,673,350	$ 4,392,632	$ 4,357,107

Voluntary Contribution Account

The Voluntary Contribution Account represents additional voluntary contributions made to the Plan. Upon retirement, a participant who has a Voluntary Contribution Account must either receive a refund of the voluntary contributions with interest or use this balance to purchase an increase in their pension payments. In line with the

Plan's recent experience, we have assumed 100% of participants will purchase additional pension payments and therefore have continued to include the balances in the table above.

The Voluntary Contribution Account balance as of the Plan year end is as follows:

	(in 000's)			
	2017	**2016**	**2015**	**2014**
Market value at end of Plan year	$ 4,551	$ 4,258	$ 4,060	$ 4,069

Actuarial Value of Assets

The actuarial value of assets for the purposes of this actuarial valuation, after taking into account the regular Employee and Employer Contributions of ERIP/VDIP participants, is determined to be $4,673,351,000, which is equal to the sum of:

Market Value of Assets as at January 1, 2018:	$ 4,673,350,000
Present Value of Adjustments in respect of ERIP/VDIP participants:	
• future Employee and Employer Contributions, net of non-investment expenses	$ 1,000
Actuarial Value of Assets as at January 1, 2018:	$ 4,673,351,000

Pension Fund Investment Return

The Fund has earned the following approximate rates of return, net of investment and custodial fees, in the years 2006 through 2017. Calculations were based on the audited financial statements.

Year	Pension Fund Net Investment Return on Market Value
2006	6.3%
2007	3.5%
2008	-0.4%
2009	3.5%
2010	15.8%
2011	19.8%
2012	5.0%
2013	-8.4%
2014	19.8%
2015	6.3%
2016	3.7%
2017	10.5%
3 year average (per annum)	6.8%
Geometric Average Over Period Shown	6.8%

The rates of return were derived on the assumption that new money was received at a constant rate over each year.

Asset Distribution

The following table shows the approximate asset class allocation of investments of the Fund, derived from the custodial reports, based on market value as at January 1, 2018 with comparative figures at January 1, 2015:

	January 1, 2018	January 1, 2015
Duration Matching Assets:		
• Bonds	36.9%	52.9%
• Mortgages and Debenture Funds[1]	13.4%	14.9%
• Hedge Funds[2]	3.1%	3.9%
• Direct Lending[2]	3.5%	0.0%
• Short-Term Bond[2]	7.6%	3.3%
• Cash[1]	3.7%	1.9%
Sub-total	68.2%	76.9%
Other Assets:		
• Real Estate	19.4%	17.1%
• Public Market Equity	1.0%	0.9%
• Private Market Equity	3.9%	2.5%
• Infrastructure Equity	7.4%	2.5%
• Cash, Short Term Notes and Other	0.1%	0.1%
Sub-total	31.8%	23.1%
Total	100.0%	100.0%

The following table shows the approximate allocation of investments of the Fund that are non-Canadian dollar denominated and unhedged as at January 1, 2018:

	Asset Allocation
• Public Market Equity	0.2%
• Private Market Equity	4.3%
• Infrastructure Equity	1.7%

[1] At January 1, 2018, 6.0% are held in the Plan's bond overlay structure.

[2] These investments are held in the Plan's bond overlay structure.

Target Asset Mix and Asset Mix Ranges

The target asset mix and asset mix ranges as permitted by the Plan's investment policy as at January 1, 2018 is as follows:

	Target Asset Allocation	Asset Allocation Range
• Special Bond Portfolio	32.5%	Remainder of assets not allocated to the asset classes described below
• Mortgages outside of Bond Overlay Structure	10.0%	0.0% - 15.0%
• Equity	2.5%	0.0% - 5.0%
• Private Equity	5.0%	0.0% - 7.5%
• Infrastructure Equity	15.0%	5.0% - 20.0%
• Real Estate	15.0%	5.0% - 20.0%
• Bond Overlay Structure, Including Mortgages, Hedge Funds and Direct Lending	20.0%	10.0% - 25.0%

Section 2A: Funded position – going concern

A going concern actuarial valuation, which assumes that the Plan will continue indefinitely, was performed to determine the funded position of the Plan at January 1, 2018 and to determine whether over the long term, the Plan is likely to have sufficient assets to provide the benefits promised.

The following exhibit compares the funded position of the Plan on a going concern basis at January 1, 2018 and January 1, 2015.

	January 1, 2018 (in 000's)	January 1, 2015 (in 000's)
A. Actuarial Value of Assets		
Actuarial value of assets	$ 4,673,351	$ 4,228,818
B. Actuarial Liabilities		
Actuarial liabilities for accrued benefits in respect of:		
• Active participants	$ 621,059	$ 769,685
• Disabled participants	93,196	96,826
• ERIP participants	1,414	12,708
• VDIP & ERIP–Equivalent participants	-	3,996
• Transferred to management participants	71,270	79,287
• Terminated vested participants[1,2]	172,190	210,482
• Pensioners[3]	2,672,449	2,359,344
• Voluntary Contribution Accounts	4,551	4,069
Total actuarial liabilities	$ 3,636,129	$ 3,536,397
C. Funded Position		
Excess of actuarial value of assets over actuarial liabilities for accrued benefits (A.) - (B.)	$ 1,037,222	$ 692,421
D. Funded Ratio		
Ratio of actuarial value of assets to accrued actuarial liabilities (A. / B.)	1.29	1.20

[1] Including Pending Terminations and paid out after actuarial valuation date.

[2] Including non-vested Lives and untraced deferred vested Lives.

[3] Including Beneficiaries and Survivors.

The approximate actuarial present value of the provision for adverse deviations included in the actuarial liabilities above is as follows:

- Margin included in the Interest rate = $360M; and
- Margin included in the pre- and post-retirement mortality rates = $46M.

The approximate actuarial present value of future expenses payable by the pension plan and included in the actuarial liabilities above is as follows:

- Provision for administrative expenses = $34M; and
- Provision for passive investment management expenses = $53M.

An analysis of the major factors which contributed to the change in the funded position of the Plan on a going concern basis is set out in Section 5 of this report.

Impact of Change in Interest Rates

Based on the current actuarial valuation assumptions, a 1.0% decrease in the actuarial valuation rate from 4.10% to 3.10% will increase the total accrued going concern actuarial liabilities of the Plan as at January 1, 2018 by 13.2% or $480.6 million. However, as the majority of the Plan's assets are invested in a fixed income portfolio, given a 1.0% decrease in interest rates, we expect that the market value of the Plan's assets as at January 1, 2018 will increase at a percentage approximately equal to or exceeding the percentage increase in the liabilities.

Section 2B: Funded position – solvency

A solvency actuarial valuation, which is required under the PBSA-85, is one in which the Plan's assets and liabilities are valued on a Plan termination basis. We have conducted a solvency actuarial valuation for the Plan as at January 1, 2018 on the assumption that the Plan would be terminated at that date based on the Plan provisions in effect as at January 1, 2018 (including the increase to benefits in payment effective April 1, 2018); such provisions include the restriction that the Trustees shall not grant consent for subsidized reduction (that is, unreduced benefits) on early retirement other than actuarial reduction for all active and inactive non-retired participants, except for the ERIP participants. To determine the solvency deficiency or solvency excess, the PBSA-85 permits certain adjustments to be made to the solvency assets.

The following exhibit compares the Plan's solvency position at January 1, 2018 and January 1, 2015.

	January 1, 2018 (in 000's)	January 1, 2015 (in 000's)
A. Solvency Assets		
i. Market value of assets plus receivable[1]	$ 4,673,350	$ 4,228,728
ii. Allowance for Plan windup expenses	(2,658)	(2,000)
iii. Solvency assets (assets less expenses)	$ 4,670,692	$ 4,226,728
B. Solvency Liabilities		
Settled by lump sum transfer:		
i. Active participants	$ 287,679	$ 535,191
ii. Disabled participants	20,826	58,951
iii. ERIP participants	-	8,047
iv. VDIP & ERIP–Equivalent participants	-	2,729
v. Transferred to management participants	37,272	48,927
vi. Terminated vested participants	98,415	164,500
vii. Total settled through lump sum transfer (Sum Bi. to Bvi.)	$ 444,192	$ 818,345
Settled by replicating portfolio:		
viii. Active participants	$ 279,830	$ 147,932
ix. Disabled participants	65,603	27,207
x. ERIP participants	1,571	5,559
xi. VDIP & ERIP–Equivalent participants	-	-
xii. Transferred to management participants	18,012	6,822
xiii. Terminated vested participants	76,196	28,190

[1] For the purposes of the solvency actuarial valuation, the future regular Employee and Employer contributions in respect of participants of the ERIP/VDIP have been excluded. Excluding these contributions has no financial impact on the solvency position of the Plan.

	January 1, 2018 (in 000's)	January 1, 2015 (in 000's)
xiv. Pensioners[1]	2,931,886	2,471,153
xv. Total settled by replicating portfolio (Sum Bviii to Bxiv)	$ 3,373,098	$ 2,686,863
xvi. Total Solvency Liabilities (Bvii+Bxv)	$ 3,817,290	$ 3,505,208
C. Solvency Position – (A)(iii) - (Bxvi)	853,402	721,520
D. Solvency Ratio – (A)(iii)/(Bxvi)	1.22	1.21

The solvency ratio, as defined by the PBSA-85, is not less than 1.0 for the Plan at January 1, 2018. As explained earlier in this report, no restrictions are required, as described under the PBSA-85, on the lump sum portability transfers which may be made from the Plan until a subsequent actuarial valuation indicates that the ratio has changed.

The approximate actuarial present value of the provision for adverse deviations included in the replicating portfolio liabilities above is as follows:

- Margin included in the Interest rate = $98M; and
- Margin included in the pre- and post-retirement mortality rates = $49M.

The approximate actuarial present value of future expenses payable by the pension plan and included in the replicating portfolio liabilities above is as follows:

- Provision for administrative expenses = $17M; and
- Provision for passive investment management expenses = $30M.

Funded Position – Termination Scenario

For the solvency actuarial valuation, the Plan has been assumed to have a hypothetical voluntary termination on the actuarial valuation date. Under this scenario, for all members not yet retired, consent would not be given for favourable early retirement subsidized benefits, other than actuarial reductions.

Retired Participants and Non-Retired Participants Eligible to Retire Immediately

For all retired participants and all other participants who are eligible to retire immediately, the solvency scenario assumes the Trust will continue to deliver monthly pension benefits. Under this scenario, the assets of the Plan would be invested in a replicating portfolio that approximately matches the duration and cash flow characteristics of the group's remaining benefits cash flows.

All Other Participants Not Included Above

For participants not eligible to retire immediately, under the termination scenario, lump sum transfers would be made to discharge all benefit entitlements in the Plan.

[1] Including Beneficiaries and Survivors.

Replicating Portfolio

Rationale

The amount of liabilities to be discharged under one or several annuity contracts would be in excess of $2.5 billion. From the Canadian Institute of Actuaries Educational Note: Alternative Settlement Methods for Hypothetical Wind-up and Solvency Valuations (document 213082) dated September 2013 (herein referred to as "CIA Educational Note"), it is noted that for non-indexed annuity liabilities in excess of $500 million, it may be difficult to effect a single annuity purchase. The Plan's liabilities, to be settled in this manner, are more than six times this amount and therefore can be argued to be limited by the Canadian annuity market.

If the Plan was to be wound up, it is reasonable to assume that the Trust would continue with a board of trustees to manage the delivery of pension benefits for current retirees and participants immediately eligible to retire, for the foreseeable future (at least the next 20 years). In this scenario to ensure the security of the remaining benefits to be delivered, a replicating portfolio would be put in place. This replicating portfolio would substantially consist of high quality fixed income instruments that closely match the cash flow and duration characteristics of the remaining benefits to be delivered.

The Plan has adopted an investment strategy in which the majority of the Plan's assets are currently invested in a fixed income portfolio that approximately matches the expected benefit cashflows of the Plan. Given that most of the assets required to establish the replicating portfolio are already owned by the Plan one could comfortably conclude that sufficient capacity of fixed-income securities is provided in the market.

Methodology and Assumptions

The methodology used to construct the replicating portfolio, its composition, provisions for adverse deviation, expenses and other required assumptions used for the benefit cashflows can be found in Section 6B.

Security of Benefits Utilizing Replicating Portfolio Methodology

As required by OSFI we have used a deterministic approach to determine the financial impact of adverse experience with respect to mortality and longevity risks as well as economic risks, including asset default and downgrade risks.

The replicating portfolio was constructed using high quality fixed income assets, taking the benefit cashflows into account. The benefit cashflows have been created assuming the mortality experience follows that of the 2014 Canadian Pensioners' Private Sector Mortality Table (CPM2014Priv) with generational mortality using improvement scale CPM-B (CPM Table). As discussed in Section 6A, these rates include a margin for mortality improvement and longevity risk. The margin as measured on a replicating portfolio basis is equivalent to an increase in solvency liabilities of approximately 1.5% or $49M.

The assumed average yield and assumed asset default and downgrade risk as provided by the Plan's main bond manager (CIBC Asset Management) and based on historical experience are as follows:

	Asset Mix	Average Yield	Default and downgrade risk (net of recovery)
Provincial Bonds	80%	3.09%	0.00%
'BBB' Corporate Bonds	20%	5.34%	0.06%

The adverse deviation margin of 0.23% built into the replicating portfolio interest rate allows for 20% of the corporate bond allocation to default completely, lowering the average yield to 4.27%. As the expected default and downgrade risk (net of recovery) of corporate bonds is well within the allowed for margin, one can conclude that there is a high probability that the benefits will be made in full in the future should the unlikely event of plan windup occur. This does not take into account the large amount of surplus assets also available to help support promised benefits.

Required Additional Disclosures

As required by the CIA Standards, for Plan's that utilize a replicating portfolio method, the actuarial report must also disclose the solvency liabilities and solvency ratio that would have resulted if the single purchase of a group annuity had been assumed. The assumptions used in the group annuity valuation are summarized in Section 6B.

The following exhibit shows the solvency liabilities and solvency ratio on an annuity purchase scenario at January 1, 2018.

	January 1, 2018
Solvency Liabilities (in 000's)	$ 3,936,686
Solvency Ratio	1.19

In addition, OSFI requires the Plan to disclose the underlying equivalent annuity proxy rate that would produce an equivalent solvency liability as the replicating portfolio scenario assuming all other assumptions are those that would be used based on CIA Guidance for a single purchase of a group annuity. Specifically we have assumed mortality rates follow the CPM Mortality Table (Combined) with generational mortality projection using mortality projection Scale CPM-B (sex distinct rates).

	January 1, 2018
Annuity purchase rate	3.35%

Average Solvency Ratio

In accordance with PBSA-85, the average solvency ratio (before adjustments for plan amendments) is the arithmetic average of the solvency ratios at January 1, 2018, January 1, 2017 (the prior valuation date) and January 1, 2016 (the prior second valuation date), adjusted to reflect the plan amendments effective January 1, 2016, January 1, 2017, January 1, 2018 and April 1, 2018 from the solvency liability at January 1, 2018.

The average solvency ratio (after adjustments for plan amendments) at January 1, 2018 is equal to the average solvency ratio (before adjustments for plan amendments) multiplied by the ratio of the solvency liability at January 1, 2018 excluding the plan amendments to the solvency liabilities at January 1, 2018 including the plan amendments.

Development of Average Solvency Ratio

	(in 000's)		
	January 1, 2016[1]	January 1, 2017[1]	January 1, 2018
Adjusted Solvency Value of Assets			
Solvency Assets	N/A	N/A	$ 4,670,692
Total	N/A	N/A	$ 4,670,692
Adjusted Solvency Liability			
Solvency Liability	N/A	N/A	$ 3,817,290
Present Value of Plan amendments since January 1, 2015	N/A	N/A	$ 121,760[2]
Total	N/A	N/A	$ 3,695,530
Adjusted Solvency Ratio (before adjustment for Plan amendments)	1.2236[3]	1.2236[3]	1.2639
Average Solvency Ratio			
Average of three adjusted solvency ratios (before adjustment for Plan amendments)	1.2370		
Average of three adjusted solvency ratios (after adjustment for Plan amendments)	1.1975		

Average Solvency Ratio to Determine Funding Requirements

	January 1, 2018	January 1, 2015
Adjusted Solvency Value of Assets		
Average solvency ratio	1.1975	1.1757
Solvency liability	$ 3,817,290	$ 3,505,208
Adjusted solvency value of assets	4,571,205	$ 4,121,073
Solvency Liability	$ 3,817,290	$ 3,505,208
(Solvency Deficiency) / Solvency Excess	$ 753,915	$ 615,865

[1] No reports on actuarial valuations at January 1, 2016 and January 1, 2017 were filed.

[2] Determined at 2.80%/3.30%/3.20% per annum.

[3] In accordance with subsection 9(11) of the Pension Benefits Standards Regulations the solvency ratio without adjustments at the valuation date has been used as the adjusted solvency ratio for the prior valuation date and the prior second valuation date.

Impact of Change in Interest Rates and Solvency Incremental Cost

Based on the current actuarial valuation assumptions, a 1.0% decrease in the actuarial valuation interest rates (from 2.80%/3.30%/3.20% to 1.80%/2.30%/2.20%) will increase the total solvency liabilities of the Plan as at January 1, 2018 by approximately 14.9% or $569.8 million. However, as the majority of the Plan's assets are invested in a fixed income portfolio, given a 1.0% decrease in interest rates, we would expect the solvency assets (net of windup expenses) to increase by a percentage approximately equal to or exceeding the percentage increase in the liabilities.

We have determined the 3-year solvency incremental cost as at January 1, 2018 for the Plan to be $131,690,000.

The solvency incremental cost reflects the expected aggregate change in the Plan's liabilities from January 1, 2018 to December 31, 2020 (including decrements, expected benefit accruals and benefit improvements) on a solvency basis, adjusted upwards with the expected benefit payments in 2018, 2019 and 2020. The solvency incremental cost is meant to measure a three-year cost of accruals and benefit payments on a Plan termination basis (independent of the expected return on Plan assets) and is not an appropriate measure of the contributions that would be required to fund the Plan.

Section 3: Actuarial balance sheet – going concern aggregate actuarial cost method

	January 1, 2018 (in 000's)	January 1, 2015 (in 000's)
Assets		
1. Market value of assets on hand	$ 4,673,350	$ 4,228,728
2. Actuarial present value of future contributions to be made by participants	157,147	168,594
3. Actuarial present value of future contributions to be made by employers with respect to present participants	303,285	324,875
4. Actuarial present value of employee and employer contributions to be made in respect of ERIP/VDIP participants in the year following the actuarial valuation, less expenses	1	90
5. Company ERIP/VDIP contribution receivable in respect of the year prior to the actuarial valuation	-	-
6. Total Plan Assets (1.+2.+3.+4.+5.)	$ 5,133,783	$ 4,722,287
Liabilities		
7. Actuarial present value of retirement benefits granted to retired participants	$ 2,672,449	$ 2,359,344
8. Actuarial present value of benefits to be granted to former participants (including death before and after retirement):		
a) Who are terminated vested[1,2]	172,190	210,482
b) Who have been transferred to management	71,270	79,287
9. Actuarial present value of benefits to be granted to present disabled participants in respect of accrued service:		
a) Before retirement	918	4,554
b) After retirement (including death after retirement benefits)	92,278	92,272
10. Actuarial present value of benefits to be granted to active participants (including death after retirement benefit):		
a) On account of supplemental past service	4	18
b) On account of basic past service	270	1,197
c) On account of accrued membership service	557,489	686,432
11. Actuarial present value of death or disability before retirement benefits to be granted to active participants on account of service to the actuarial valuation date	63,296	82,038

1 Including Pending Terminations and paid out after actuarial valuation date.

2 Including non-vested Lives and untraced deferred vested Lives.

	January 1, 2018 (in 000's)	January 1, 2015 (in 000's)
12. Actuarial present value of benefits to be granted to ERIP participants in respect of service to their Severance Date	$ 1,414	$ 12,708
13. Actuarial present value of benefits to be granted to VDIP and ERIP – Equivalent participants in respect of service to their Severance Date	-	3,996
14. Voluntary contribution accounts	4,551	4,069
15. Total actuarial liabilities for accrued benefits	$ 3,636,129	$ 3,536,397
16. Excess (Deficiency) of assets on hand over total actuarial liabilities for accrued benefits (1.+4.+5.-15.)	$ 1,037,222	$ 692,421
17. Actuarial present value of benefits to be granted to present disabled participants for future membership service		
a) Before retirement	265	1,135
b) After retirement (including death after retirement benefits)	19,441	21,001
18. Actuarial present value of benefits to be granted to active participants (including death after retirement benefits) on account of future membership service	477,857	524,615
19. Actuarial present value of death or disability before retirement benefits to be granted to active participants on account of future membership service	112,697	119,966
20. Actuarial present value of future non-investment related plan expenses	-	29,608
21. Total future membership service actuarial liabilities	$ 610,260	$ 696,325
22. Excess (Deficiency) of actuarial present value of future Employer and participants' contributions over total future membership service actuarial liabilities (2.+3.-21.)	(149,828)	(202,856)
23. Excess of total Plan assets over total Plan liabilities (6.-15.-21.)	887,394	489,565
24. Total Plan Liabilities Plus Total Excess (15.+21.+23.)	$ 5,133,783	$ 4,722,287
25. Actuarial present value of future compensation	$ 3,032,846	$ 3,248,745

Section 4: Contribution Requirements

The Plan is a jointly trusteed negotiated contribution defined benefit pension plan for members of the Telecommunications Workers Union (TWU) United Steelworkers Local Union 1944 and certain employees of the Union and the Trustees.

The Employers contribute a percentage of the Bargaining Unit gross earnings as prescribed by the Collective Agreement or Participation Agreement (the Agreements) then in effect. Based on these Agreements, the actual Employer contributions were 10.00% of earnings effective January 1, 2009.

The Plan participants contributed 2% of gross earnings to the Plan prior to April 1, 1994 in accordance with the Agreements. Effective April 1, 1994, the Plan participants have contributed at the increased rates based on their ages as follows:

Under age 30	– 3% of gross earnings
Age 30 or older but under 40	– 4% of gross earnings
Age 40 or older but under 50	– 5% of gross earnings
Age 50 or over	– 6% of gross earnings

At present, the participants' required contributions are calculated to be on average approximately 4.79% of gross earnings.

Pursuant to the Collective Agreement ratified in 2011 the Company has agreed to make additional contributions to the Plan in respect of the participants who elected to leave under the ERIP/VDIP programs offered by the Company since January 1, 2005.

Under the PBSA-85 it is necessary for the actuary to test for the sufficiency of contributions to provide for the following:

- the normal cost of accruing benefits;
- the funding of going concern unfunded liabilities, if any, over a period of not more than fifteen years from the review date on which it is first determined;
- the funding of solvency deficiencies, if any, over a period of not more than five years from the review date on which it is first determined.

If negotiated contributions are not sufficient to meet these funding requirements, the actuary must provide the Trustees with options to remedy the situation.

Minimum Funding Requirements

Using the Unit Credit Actuarial Cost Method, we have calculated the required minimum funding of the Plan, expressed as a percentage of covered earnings, for the next three Plan years. The results of these calculations, along with the estimated total employer and employee contributions, are set forth below:

($ in 000's)	in 2018	in 2019	in 2020
1. Normal Cost under Plan	16.68%	16.68%	16.68%
2. Required annual special payments towards unfunded actuarial liabilities	-	-	-
3. Required annual special payments towards solvency deficiency	-	-	-
4. Total required minimum funding contributions	16.68%	16.68%	16.68%
5. Estimated total employer and employee required contributions in accordance with the Agreements	14.79%	14.79%	14.79%
6. Estimated present value of current year's contributory earnings at the beginning of year (in '000's)	$ 216,915	$ 223,422	$ 230,125
7. Estimated shortfall of contributions (in '000's) ([5.-4.]x6.)	$ (4,101)	$ (4,230)	$ (4,356)

Thus, the total negotiated contributions in 2018, 2019 and 2020 will be less than the required minimum funding contributions by approximately $12,687,000. However, as the actuarial value of assets on hand exceed the accrued actuarial liabilities by $1,037,222,000 and the Plan's solvency ratio is 1.22, the minimum funding requirements can be met.

The Normal Cost percentage (before expenses) has decreased since the prior actuarial valuation at January 1, 2015; it decreased from 17.95% in 2015 to 16.68% in 2018 because of changes in the actuarial assumptions and changes in the demographics of plan participants.

Since the last actuarial valuation, we have changed the non-investment expense assumption from 6% of required Employee and Employer contributions to a reduction of the actuarial valuation interest rate of 0.07% per annum. This was done to better reflect the high proportion of actuarial liabilities in respect of inactive participants.

The approximate actuarial present value of the provision for adverse deviations included in the Normal Cost above is as follows:

- Margin included in the Interest rate = $8M; and
- Margin included in the pre- and post-retirement mortality rates = $0.5M.

The approximate actuarial present value of the provision for expenses in the year following the valuation date, payable by the pension plan and included in the Normal Cost above is as follows:

- Provision for administrative expenses = $0.7M; and
- Provision for passive investment management expenses (paid directly to investment managers) = $1.1M.

Based on the current actuarial valuation assumptions, a 1.0% decrease in the actuarial valuation rate used in determining the value of liabilities for future service benefits, from 4.10% to 3.10%, will increase the present value (as at January 1, 2018) of the benefits expected to accrue in 2018 from 16.68% of earnings to 21.23% of earnings.

Maximum Employer Contributions and Excess Surplus

Under the *Income Tax Act (Canada)*, the maximum amount that an Employer is permitted to contribute is equal to:

- The Employer's current service cost in respect of service accruing after the actuarial valuation date; plus
- The lump sum amount to eliminate any unfunded liability and/or solvency deficiency that exists at the actuarial valuation date; less
- Any excess surplus as required.

The plan targets providing benefits upon retirement that are based on the participant's final average earnings immediately prior to retirement. Historically the trustees have approved earnings updates on an annual basis in line with that target, when certain funding goals are reached, and therefore it is reasonable to consider the position of the plan assuming benefits are based on the final average earnings when determining maximum employer contributions. We have conducted a valuation on such basis and the results of the valuation on an aggregate basis are provided below:

	January 1, 2018 (in 000's)
Assets	
1. Market value of assets on hand	$ 4,673,350
2. Actuarial present value of future contributions to be made by participants	220,856
3. Actuarial present value of future contributions to be made by employers with respect to present participants	433,520
4. Actuarial present value of employee and employer contributions to be made in respect of ERIP/VDIP participants in the year following the actuarial valuation, less expenses	1
5. Company ERIP/VDIP contribution receivable in respect of the year prior to the actuarial valuation	-
6. Total Plan Assets (1.+2.+3.+4.+5.)	$ 5,327,727
Liabilities	
7. Actuarial present value of retirement benefits granted to retired participants	$ 2,672,449
8. Actuarial present value of benefits to be granted to former participants (including death before and after retirement):	
a) Who are terminated vested[1,2]	172,190
b) Who have been transferred to management	71,270

[1] Including Pending Terminations and paid out after actuarial valuation date.

[2] Including non-vested Lives and untraced deferred vested Lives.

	January 1, 2018 (in 000's)
9. Actuarial present value of benefits to be granted to present disabled participants in respect of accrued service:	
a) Before retirement	996
b) After retirement (including death after retirement benefits)	99,516
10. Actuarial present value of benefits to be granted to active participants (including death after retirement benefit):	
a) On account of supplemental past service	4
b) On account of basic past service	272
c) On account of accrued membership service	659,471
11. Actuarial present value of death or disability before retirement benefits to be granted to active participants on account of service to the actuarial valuation date	78,511
12. Actuarial present value of benefits to be granted to ERIP participants in respect of service to their Severance Date	1,414
13. Actuarial present value of benefits to be granted to VDIP and ERIP – Equivalent participants in respect of service to their Severance Date	-
14. Voluntary contribution accounts	4,551
15. Total actuarial liabilities for accrued benefits	$ 3,760,644
16. Excess (Deficiency) of assets on hand over total actuarial liabilities for accrued benefits (1.+4.+5.-15.)	$ 912,707
17. Actuarial present value of benefits to be granted to present disabled participants for future membership service	
a) Before retirement	300
b) After retirement (including death after retirement benefits)	22,345
18. Actuarial present value of benefits to be granted to active participants (including death after retirement benefits) on account of future membership service	812,884
19. Actuarial present value of death or disability before retirement benefits to be granted to active participants on account of future membership service	180,958
20. Actuarial present value of future non-investment related plan expenses	-
21. Total future membership service actuarial liabilities	$ 1,016,487
22. Excess (Deficiency) of actuarial present value of future Employer and participants' contributions over total future membership service actuarial liabilities (2.+3.-21.)	(362,111)
23. Excess of total Plan assets over total Plan liabilities (6.-15.-21.)	550,596
24. Total Plan Liabilities Plus Total Excess (15.+21.+23.)	$ 5,327,727
25. Funded Ratio	111.5%

Data Model – New Entrants

For purposes of our actuarial valuation we have constructed a model of potential future Plan membership based on direction from the Trustees. The Trustees have reviewed the model and believe the estimates are reasonable and appropriate for use in determining the maximum contributions of the Plan. The model is based on the assumption that the membership will be stable for ten years and thereafter the membership will shrink in accordance with the decrement assumptions, commencing in year 2028.

We conducted a study of new entrants' age and contributory earnings at entry for the year 2017 and found for males the average age is 32.0 and the average contributory earnings is $44,700 and for females the average age is 30.0 and the average contributory earnings is $39,700. We then assumed that the characteristics of the new entrants will be in line with recent experience.

Actuarial Methods - Liabilities

The actuarial liability and the normal cost is conducted using the Projected Unit Credit Cost Method. The actuarial liability was determined as the actuarial present value of non-retired participant's prospective benefits multiplied by the ratio of the participant's credited service at the actuarial valuation date to the participant's total potential credited service (the service prorate method).

The actuarial liabilities for retired participants was determined as the actuarial present value of their respective benefits.

The normal cost for non-retired participant's was determined as the actuarial present value of their prospective benefits multiplied by the ratio of the participant's expected credited service in the following year to the participant's total potential credited service. The normal cost as a percentage of earnings will be stable over time if the demographic characteristics of the non-retired participants remain stable over time. All other things being equal, as the average age of non-retired participants increase (decrease) the normal cost as a percentage of earnings will increase (decrease).

Excess Surplus

The *Income Tax Act (Canada)* prescribes the maximum going concern surplus that may be retained by the Plan while Employer contributions continue. In general, this maximum is defined as 25% of the going concern actuarial liability.

There is no excess surplus at the actuarial valuation date and therefore Employer contributions are not affected by the prescribed maximum surplus limit.

Maximum Employer Contributions

The maximum Employer contributions as a percentage of covered earnings and the estimated dollar amounts for the next four years following the actuarial valuation date is shown below:

	in 2018	in 2019	in 2020	in 2021
1. Total required minimum funding contributions	21.17%	20.55%	19.95%	19.37%
2. Less: Participants' required contributions in accordance with the Agreements	(4.63%)	(4.63%)	(4.63%)	(4.63%)
3. Employer's current service cost under the Plan	16.54%	15.92%	15.32%	14.74%

	in 2018	in 2019	in 2020	in 2021
4. Plus: Contributions to eliminate any unfunded liability or solvency deficit	0.00%	0.00%	0.00%	0.00%
5. Less: Excess Surplus	(0.00%)	(0.00%)	(0.00%)	(0.00%)
6. Employer maximum contribution	16.54%	15.92%	15.32%	14.74%
7. Estimated present value of current year's contributory earnings at the beginning of year (in '000's)	$274,190	$282,416	$290,888	$299,615
8. Estimated Maximum Employer Contributions (in '000's) (6x7.)	$ 45,351	$ 44,961	$ 44,564	$ 44,163

For the years following 2018, the maximum Employer contributions may be different depending on the contributions actually made by the Employer since January 1, 2018.

Timing of Contributions

To satisfy the requirements of the PBSA-85, the Employer and participant contributions must be remitted to the fund monthly and within 30 days of the end of the month to which they pertain.

Section 5: Experience analysis

Funded Position

The going concern funded position has changed from an excess of assets over actuarial liabilities for accrued benefits of $692.4 million at January 1, 2015 to an excess of assets over actuarial liabilities for accrued benefits of $1,037.2 million at January 1, 2018. The following exhibit provides an approximate analysis of the major factors which have contributed to this change.

	(in 000's)	(in 000's)
A. Excess of assets over actuarial liabilities for accrued benefits at January 1, 2015	$ 692,400	
Plus • interest adjustment	85,300	
Expected excess of assets over actuarial liabilities for accrued benefits at January 1, 2018	$ 777,700	$ 777,700
B. Gains/(Losses) from Economic Experience:		
• net investment returns greater/(less) than assumed	$ 374,000	
• expenses lower/(higher) than assumed	(1,200)	
• excess/(shortfall) of Employer and Employee contributions over/(under) the actuarial liabilities for benefit credits earned during the same period, taking into account the increases in earnings	(16,900)	$ 355,900
C. Gains/(Losses) from Demographic Experience:		
• retirement experience not in ERIP/VDIP program	$ 5,400	
• mortality experience	6,100	$ 11,500
D. Gains/(loss) due to all other economic and demographic experience factors	$ (12,800)	$ (12,800)
E. Gains/(Losses) from Plan amendments		
• benefit improvements during the intervaluation period – added actuarial liabilities with respect to updating of benefit credits at January 1, 2016, January 1, 2017 and January 1, 2018	$ (47,300)	$ (47,300)
F. Fund financial position at January 1, 2018 on prior actuarial valuation assumptions = A.+B.+C.+D.+E.	$1,085,000	$1,085,000
G. Change in actuarial assumptions		
• change in the interest rate assumption from 3.95% to 4.10%	$ 63,300	
• change in the mortality assumptions	(44,800)	$ 18,500
H. Gains/(Losses) from Plan amendments		
• benefit improvement after valuation date – added actuarial liabilities with respect to increasing benefits in payment effective April 1, 2018	$ (66,300)	$ (66,300)

		(in 000's)	(in 000's)
I.	**Excess of assets over actuarial liabilities for accrued benefits at January 1, 2018**		
	Fund financial position at January 1, 2018 on current actuarial valuation assumptions after the January 1, 2018 benefits updating and the April 1, 2018 increase in benefits in payment		$1,037,200

Normal Cost

The cost of benefits accruing, including the allowance for expenses, expressed as a percentage of covered payroll has decreased from 18.84% in the previous valuation to 16.68% at January 1, 2018.

The following exhibit provides an approximate analysis of the major factors which have contributed to this change:

Minimum funding contribution rate at January 1, 2015 for current benefit accruals and expenses		18.84%
Plus	increase resulting from change in valuation mortality assumption	0.19%
Less	decrease resulting from change in valuation interest rate assumption	(0.84%)
	decrease resulting from change in demographics	(0.89%)
	decrease resulting from change in non-investment expense assumption	(0.62%)
Minimum funding contribution rate at January 1, 2018 for current benefit accruals and expenses		16.68%

Section 6A: Actuarial basis – going concern

Introduction

Pension plans are long term financial commitments and for a negotiated contribution plan the cost of these commitments (or liabilities) must be estimated in order to confirm that the funds being set aside would be sufficient to meet them.

To estimate the cost of the future commitments, assumptions must be made about future events and conditions that will affect the cost. These assumptions may be categorized as either economic or demographic assumptions. Economic assumptions pertain to factors such as the rate of investment return, inflation and earnings increases. Demographic assumptions pertain to events affecting the Plan participants, such as terminations, mortality, and retirement and other assumptions which pertain to conditions that are more Plan specific, such as marital status and the percentage of Plan participants selecting survivors' benefits.

The actuarial basis of calculation for this actuarial valuation is set out below. The actuarial basis includes the economic and demographic assumptions used to value the liabilities. It also includes the actuarial methods used to determine the actuarial value of assets and the allocation of actuarial liabilities to past and future service for determination of the funded position and adequacy of contributions (as provided for in the Collective Agreement) to fund the Plan benefits.

Future events will show the actual cost to be higher or lower than the actuarial estimate since any difference between the Plan's actual experience and the actuarial assumptions will emerge as experience gains or losses in future actuarial valuations. In the long run, the cost of the Plan will ultimately be determined by the benefits provided and by the Plan's actual experience, not by the actuarial basis chosen from time to time by actuaries to estimate this cost.

As in previous actuarial reviews, we have considered the appropriateness of the actuarial assumptions and methods which were used in the previous actuarial valuation in the context of a long term horizon. Since changes in the actuarial basis affect the funded position as reported, major changes are not made frequently or without good reason. We expect to modify the actuarial basis from time to time in response to changing circumstances and experience.

Any changes in assumptions, methods or basis from those employed in the previous actuarial valuation are noted in this section.

Summary of Actuarial Basis

	January 1, 2018	January 1, 2015
Economic Assumption		
Rate of Inflation	2.00% per annum	Same
Interest rate net of expenses	4.10% per annum	3.95% per annum[1]
Non-investment expenses	Included in the interest rate	6% of required Employee and Employer contributions
Earnings increases		
• For actuarial valuation	2017 annualized earnings increased by 3% per annum (assumed)	2014 annualized earnings increased by 3% per annum (assumed)
• For updating	• 2018 earnings = 2017 earnings increased by 3% • 2019 earnings = 2018 earnings increased by 3% • 2020 earnings = 2019 earnings increased by 3%	• 2015 earnings = 2014 earnings increased by 3% • 2016 earnings = 2015 earnings increased by 3% • 2017 earnings = 2016 earnings increased by 3%
Variable pay	5% per annum	Same
Interest on employee contributions	Same as interest rate	Same
Demographic Assumptions		
Mortality rates	2014 Canadian Pensioners' Private Sector Mortality Table (CPM2014Priv) with generational mortality using improvement scale CPM-B (CPM Table) (Table 1)	2014 Canadian Pensioners' Private Sector Mortality Table (CPM2014Priv) adjusted for size and industry factors with generational mortality using improvement scale CPM-B (CPM Table) (Table 1)
Termination rates	None assumed	Same
Retirement rates for active participants	Age related (Table 2)	Same
Retirement age for terminated vested and transferred to management participants	Earliest age at which an unreduced retirement benefit may be granted	Same
Disability rates	Age related (Table 3)	Same

[1] Net of investment expenses only.

	January 1, 2018	January 1, 2015
Disabled Mortality rates	2014 Canadian Pensioners' Private Sector Mortality Table (CPM2014Priv) with generational mortality using improvement scale CPM-B (CPM Table) (Table 1)	Special table, with blended rates from the UP94 Mortality Table and those used in the January 1, 1993 actuarial valuation, for present and future disabled participants, before retirement (Table 4)
Disabled Retirement Age		
• Date of Disability prior to September 1, 1990	Age 65	Same
• Date of Disability after September 1, 1990	Age of attaining 25 years of service but not prior to age 60 or later than age 65	Same
Other Assumptions		
Marital Status		
• non-pensioners	100% married	Same
• pensioners	Actual	Same
Member/Spouse Age Difference		
• non-pensioners	Males 3 years older	Same
• pensioners	Males 3 years older if actual DOB not available	Same
New entrants	None assumed	Same
Voluntary Contribution Account	100% purchase additional benefit payments under the Plan upon retirement	n/a
Benefits subject to consent	Included	Same
Actuarial cost method	Aggregate Accrued benefit	Same
Asset valuation method	Market value[1]	Same

[1] Plus, where applicable, the additional regular Employer and Employee contributions receivable in respect of participants of the ERIP/VDIP programs.

Table 1 – Sample Mortality Rates

Age	Rates per 1000 Participants			
	CPM Private Sector Table			
	Base Table – used at January 1, 2018		Adjusted with Size and Industry Factors – used in conjunction with Base Table at January 1, 2015	
	Male	Female	Male	Female
20	0.93	0.20	1.02	0.21
25	1.23	0.27	1.34	0.28
30	1.36	0.33	1.49	0.35
35	1.36	0.46	1.49	0.48
40	1.54	0.67	1.68	0.70
45	2.16	0.95	2.36	0.99
50	3.01	1.42	3.29	1.49
55	4.53	2.28	4.95	2.39
60	7.27	3.85	7.94	4.03
65	10.24	6.18	11.19	6.47
70	14.88	9.74	16.26	10.20
75	25.00	16.15	27.31	16.91
80	45.07	30.00	49.24	31.41

Table 2 – Retirement Rates

Age	Rates per 1000 Participants	
	Male	Female
54 or under	0.0	0.0
55	100.0	100.0
56	200.0	150.0
57	200.0	150.0
58	100.0	120.0
59	100.0	120.0
60	215.6	215.6
61	266.8	266.8
62	219.2	219.2
63	272.8	272.8
64	327.6	327.6
65	1,000.0	1,000.0

Table 3 – Sample Disability Rates

Age	Rates per 1000 Participants	
	Male	Female
34 or under	0.0	0.0
35	1.8	3.6
40	3.6	7.2
45	3.6	7.2
50	5.4	10.8
55	12.6	25.2
60 or over	0.0	0.0

Table 4 – Sample Disabled Mortality Rates before Retirement (January 1, 2015 actuarial valuation)

Age	Rates per 1000 Participants	
	Male	Female
20	15.4	10.2
25	15.1	10.0
30	14.9	10.0
35	14.7	10.9
40	13.5	9.0
45	13.2	8.7
50	13.2	8.6
55	14.9	9.5
60	17.8	11.2
65	24.6	15.6

Rationale for Actuarial Assumptions

Rate of Inflation

The assumption reflects an estimate of future rates of inflation considering economic and financial market conditions at the actuarial valuation date.

For purposes of estimating the cost of increases to benefits in payment at April 1, 2019, 2020 and 2021, it was assumed that the increase each year will be equal to 0.50% (i.e. 25% of the 2.0% assumed rate of inflation).

Interest Rate

The Trustees have adopted an investment strategy which consists primarily of investing the assets in fixed income instruments. The strategy serves to provide greater certainty that the benefits will be fully funded by the assets on hand plus the investment earnings on such assets and future contributions. Securities have been selected with regard to the expected contribution and benefit cashflows to ensure that the Plan's benefits can be provided with a high degree of certainty.

As long as the above mentioned investment strategy remains in place, the actuarial valuation interest rate assumption, to be used in determining the accrued liabilities at the actuarial valuation date, will be determined by reference to the expected yield on the assets held in respect of these liabilities at the same date.

To determine the expected yield on the assets, the expected return for each asset class is multiplied by the percentage that each asset class represents of the total fund. The 4.10% per annum actuarial valuation interest rate was determined as follows:

a) the assumed rate of inflation of 2.00% per annum, plus

b) the expected long-term real return of 3.03% per annum, which is equal to a blend of the expected long-term real return as at January 1, 2018 on the fund's assets existing at that date (2/3^{rds}) and on the fund's asset mix reflecting future commitments already made but not yet drawn down (1/3rd), less

c) an allowance for directly paid investment management fees of 0.11% per annum, less

d) an allowance for non-investment fees of 0.07% per annum, less

e) a margin for adverse deviations of 0.75% per annum comprised of 0.30% per annum for default risk, mismatching, other interest rate risks and 0.45% per annum for other non-investment assumptions.

The margin set out in e) above is intended to include the default risk margin and a provision for the potential that the non-fixed income assets will not perform as well as anticipated.

Plan Expenses – investment and non-investment

The interest rate is net of all expenses. The assumed expense level is based on the last several years of experience of the Plan as well as on future expectations.

Expenses were assumed to be 6% of total Employer and Employee contributions in the January 1, 2015 actuarial valuation. The assumption was changed to better reflect the high proportion of actuarial liabilities in respect of inactive participants.

Earnings Increases

We have increased each participant's 2017 annualized covered earnings by 3% per annum to estimate 2018 and future earnings for purposes of projecting future Employee and Employer contributions to the Plan and calculating the actuarial liabilities for benefits to be accrued after the actuarial valuation date.

Pursuant to the Collective Agreement ratified in 2011, variable pay was offered to eligible participants as a portion of their earnings. In this actuarial valuation, all active and disabled participants are assumed to be eligible for variable pay at 5% of regular earnings per annum from the actuarial valuation date, the same assumptions as in the January 1, 2015 actuarial valuation.

Mortality

In our prior valuation mortality rates were taken from the sex-distinct 2014 Canadian Pensioners' Private Sector Mortality Table with generational mortality using improvement scale CPM-B. The table was adjusted to reflect the size of participants' pension benefits relative to the CPM table (factor adjustment of 1.020975 for male participants and 0.978555 for female participants). It was further adjusted for industry and Plan experience (factor adjustment of 1.07).

To ensure the adjustments made to standard mortality table remain reasonable we have conducted an analysis of actual to expected pre and post-retirement mortality experience for the period from January 1, 2008 to December 31, 2017. The results of this analysis are shown below:

(A) Pensioners

	January 1, 2008 to December 31, 2014	January 1, 2015 to December 31, 2015	January 1, 2016 to December 31, 2016	January 1, 2017 to December 31, 2017	January 1, 2008 to December 31, 2017	January 1, 2015 to December 31, 2017
Total deaths	964.0	179.0	208.0	189.0	1,540.0	576.0
Expected deaths based on						
• CPM private table with generational projection, adjusted by size and industry factors	959.3	175.9	185.5	192.3	1,513.0	553.7
Mortality ratio (actual/expected)						
• CPM private table with generational projection, adjusted by size and industry factors	1.00	1.02	1.12	0.98	1.02	1.04

(B) Active Participants

	January 1, 2008 to December 31, 2014	January 1, 2015 to December 31, 2015	January 1, 2016 to December 31, 2016	January 1, 2017 to December 31, 2017	January 1, 2008 to December 31, 2017	January 1, 2015 to December 31, 2017
Total deaths	37.0	3.0	4.0	4.0	48.0	11.0
Expected deaths based on						
• CPM private table with generational projection, adjusted by size and industry factors	81.1	10.2	9.0	8.3	108.6	27.5
Mortality ratio						
• CPM private table with generational projection, adjusted by size and industry factors	0.46	0.29	0.44	0.48	0.44	0.40

We believe that it is appropriate to base our conclusions on the actual and expected deaths for the ten year period from January 1, 2008 to December 31, 2017.

The aggregate pensioner mortality is closely matched by the CPM private table with generational projection, adjusted by size and industry factors however the aggregate active participant mortality experience has been lower than this same mortality table. However, because mortality rates are lower for younger ages, the mortality assumption for active participants has less impact on the liabilities than the mortality assumption for pensioners.

Based on the findings above we conclude the CPM private table with generational projection, adjusted for size and industry factors, continues to provide a good representation of the mortality experienced by the Plan membership and can be considered a best estimate. However, for the January 1, 2018 actuarial valuation we have removed the adjustments for size and industry factors and therefore have included a margin for adverse deviations in regards to mortality improvements and longevity risk.

Termination

No allowance has been made for withdrawals prior to retirement as including such assumption would not have a material impact on the actuarial valuation results.

Retirement from active participant status

We have continued to utilize the same rates of retirement that were used for the January 1, 2015 actuarial valuation as the Plan’s experience over recent years cannot conclusively suggest that the assumption is inappropriate for the Plan and the current rates of retirement are consistent with an assessment of future expectations. All participants are assumed to commence their pension at the retirement date.

Retirement from termination vested and transferred to management status

For purposes of valuing benefit liabilities with respect to former participants (terminated vested), it was assumed that the former participants would retire at the earliest age at which an unreduced retirement benefit may be granted based on their respective dates of termination.

For purposes of valuing benefit liabilities with respect to transferred to management participants, it was assumed that their eligibility service for unreduced retirement benefit will continue to grow until retirement and they would retire at the earliest age at which an unreduced retirement benefit may be granted.

Disability

The rates of disability are based on the Plan's experience and an assessment of future expectations. No recovery rate is assumed. The same rates of disability were used for the January 1, 2015 actuarial valuation.

Disability Mortality Rates before Retirement

Pre-retirement mortality rates for disabled participants were assumed to follow the mortality rates of the non-disabled participants. As the number of disabled participants is small relative to the total number of Plan participants the choice of mortality rates will not be material.

In the January 1, 2015 actuarial valuation, the rates were blended from the UP94 Mortality Table and a special table of rates used in the January 1, 1993 actuarial valuation, which was based on Plan experience. Therefore our current assumption provides an additional margin for adverse experience.

Marital Status and Spouse's Age

For purposes of calculating the actuarial liability for the pre-retirement spouse's benefit, we have continued to assume that 100% of participants and former participants were married at date of death and on average a female spouse is three years younger than a male spouse.

For purposes of calculating reserves for benefits payable to retired participants who have elected Joint and Last Survivor options, if the date of birth of a spouse is not available, it was assumed a female spouse is three years younger than a male spouse.

Maximum Pensions

For purposes of our current actuarial valuation and cost calculations, we have ignored the maximum pension limitations contained in the Income Tax Act as these have no material impact on the results.

New Entrants

As with our previous actuarial valuations, we have continued to make no advance allowance for replacement of participants who retire, die or become disabled in the future.

Voluntary Contribution Account

We have assumed that all participants who have a Voluntary Contribution Account balance at the time of their retirement will choose to purchase additional benefits under the Plan. This assumptions is consistent with the Plan's recent experience.

Benefits subject to consent

Upon receipt of consent from the Board of Trustees, participants are eligible to receive pension benefits inclusive of the early retirement subsidies upon retirement from the Plan.

For purposes of valuing benefit liabilities, it was assumed that consent is provided and therefore the cost of providing such early retirement subsidies has been included in the actuarial liabilities.

Going Concern Actuarial Methods

Assets

As with our last actuarial valuation, the actuarial value of assets for this actuarial valuation was set equal to the market value of assets adjusted for benefits and expenses due and unpaid and contributions in transit. Furthermore, the actuarial value of assets includes the 2018 regular Employee and Employer contributions receivable in respect of participants of the ERIP/VDIP program, if any.

Liabilities

The going concern actuarial valuation of the liabilities is conducted using the Aggregate Actuarial Cost Method. This is the same as the method used in the previous actuarial valuation. The results of our calculations are presented in the form of an actuarial balance sheet as shown in Section 3. We have assembled these results in order to compute the actuarial liability for benefits accrued for service up to the actuarial valuation date, so that this figure can be compared with the assets on hand.

The accrued actuarial liabilities are determined based on service and benefit credits accrued up to the actuarial valuation date and are equal to the sum of:

a) the actuarial present value of benefit credits accrued to non-pensioners; and

b) the actuarial present value of benefits payable to pensioners.

For purposes of determining the required minimum funding under the PBSA-85, the actuarial liabilities for benefits to be earned in the year following the actuarial valuation date are calculated based on the Unit Credit Cost Method, expressed as a percentage of covered earnings, and the assumptions outlined in this Section. It has been assumed that the Unit Credit Cost, expressed as a percentage of covered earnings, for the years 2019 and 2020 will be approximately equal to the cost calculated for 2018. This implicitly assumes that new entrants will replace active participants who leave because of death, disability or retirement and that the demographic profile of the membership will be preserved.

Benefits Valued

The benefits valued were those in effect at the actuarial valuation date as described in Section 7.

For purposes of disability benefit, we assumed that all future disabled participants will receive long term disability benefit payments under the Company disability plan and will accrue benefit credits under the Plan until retirement. The retirement age of 65 is applied for the participants who became disabled prior to September 1, 1990. For all other disabled participants, the retirement age was set to the age when they would attain 25 years of service, but not prior to age 60 or later than age 65.

Contributions

This is a negotiated contribution, jointly trusteed defined benefit pension plan.

In our calculations we assumed that future contributions would be paid by Employees and Employers in accordance with the terms of the applicable Collective Agreements or special agreements entered into between the parties concerned. As of January 1, 2018 the required rates of contribution for Employees and Employers are as shown in Section 4. Contributions were assumed to be received monthly.

Section 6B: Actuarial basis – solvency

Introduction

As required by the PBSA-85, a solvency actuarial valuation was performed on the Plan as at January 1, 2018 in accordance with the standards prescribed by the PBSA-85. The following actuarial assumptions and methods were used in performing the solvency actuarial valuation.

Summary of Actuarial Basis

	January 1, 2018	January 1, 2015
Economic Assumptions		
Interest Rate		
• Lump sum transfers	2.80% per annum for 10 years, then 3.30% per annum	2.40% per annum for 10 years, then 3.70% per annum
• Replicating Portfolio • Annuity Purchase	3.20% per annum 3.05% per annum	3.50% per annum 2.60% per annum
Allowance for expenses on windup • Replicating Portfolio • Annuity Purchase	 $2,658,000 (assumed to be the sum of a fixed cost of $100,000 to set up replicating portfolio plus $400 per non-retired participant) $4,511,000 (assumed to be the sum of a fixed cost of $1,000,000 plus $400 per non-retired participant plus $100 per retired participant)	 $2,000,000 (0.047% of market value of assets) $7,600,000 (0.18% of market value of assets)
Earnings increases	Nil	Nil
Demographic Assumptions		
Mortality		
• Lump sum transfers/Annuity Purchase	2014 Canadian Pensioners' Combined Mortality Table with generational mortality using improvement scale CPM-B (CPM Table)	UP94 Mortality Table with generational mortality using mortality projection scale AA (sex-distinct rate)

	January 1, 2018	January 1, 2015
• Replicating Portfolio	2014 Canadian Pensioners' Private Sector Mortality Table (CPM2014Priv) with generational mortality using improvement scale CPM-B (CPM Table) (Table 1)	2014 Canadian Pensioners' Private Sector Mortality Table (CPM2014Priv) with generational mortality using improvement scale CPM-B (CPM Table), adjusted for size and industry factors (Table 1)
Termination	Immediate	Same
Retirement age		
• active participants who elect ERIP	Date of severance	Same
• other active participants	Age 65	Same
• disabled participants	Age 65	Same
• terminated vested and transferred to management participants	Age 65	Same
Disability	None assumed	Same
Other Assumptions		
Settlement Method		
• Lump sum transfers	Only non-retired participants not eligible to retire immediately	Non-retired participants not eligible to retire immediately and 50% of non-retired participants eligible to retire immediately
• Replicating Portfolio/Annuity Purchase	Retired participants and beneficiaries of retired participants and 100% of non-retired participants eligible to retire immediately	Retired participants and beneficiaries of retired participants and 50% of non-retired participants eligible to retire immediately
Voluntary Contribution Account	100% purchase additional benefit payments under the Plan upon retirement	n/a
Benefits subject to consent	Not included	Same
Actuarial cost method	Accrued benefit	Same
Asset valuation method	Market value	Same

Solvency Liability Scenario

The solvency actuarial valuation is based on a solvency liability scenario, involving the participants' accrued pensions and associated rights, based on applicable statutory windup requirements, Plan provisions, credited service, historical earnings and accumulated contributions up to the actuarial valuation date.

Replicating Portfolio

At January 1, 2018 we have valued the scenario for which participants who have retired and those participants who are eligible to retire, the Plan will continue to provide monthly pension benefits. The Plan's assets would be invested in a replicating portfolio with similar cash flow and duration characteristics to the accrued benefit cash flows. All other member benefits are discharged through lump sum transfers.

Annuity Purchase

As required by the CIA Standards, we have also disclosed information assuming that, in the wind-up scenario, a single premium annuity purchase is completed for those participants who have retired and those who are eligible to retire. All other member benefits are discharged through lump sum transfers.

Rationale for Actuarial Assumptions

Replicating Portfolio

It was assumed that, in the event of Plan windup, the Trust would invest the assets in a replicating portfolio that would approximately match the cash flow and duration characteristics of the accrued benefit cashflows in respect of retired participants, beneficiaries of retired participants and 100% of non-retired participants at the actuarial valuation date.

The replicating portfolio was produced, as of the actuarial valuation date, by the Plan's primary bond manager (CIBC Asset Management) after taking Plan benefit cashflows into account:

Asset Mix (and gross avg. yield):	80% provincial bonds (average yield = 3.09%) 20% 'BBB' corporate bonds (average yield = 5.34%)
Modified Duration:	12.6 years
Expected Gross Yield:	3.54%
Expenses (investment):	0.07%
Expenses (non-investment):	0.04%
Provision for Adverse Deviations:	0.23%
Net Yield to Value Liabilities:	3.20%

Passive fixed income investment manager expenses are assumed to be 0.07% of assets which is equivalent to the current investment fees paid to CIBC Asset Management. Non-investment expenses to continue managing the Trust are assumed to be 0.04%. In 2018, this equates to approximately $1.9 million. Actual non-investment expenses in 2017 were $2.7 million. It is noted that the cost of administering the Plan would decrease significantly given that only monthly benefits are being paid and no active participants would remain.

The provision for adverse deviation is 0.23% of assets. This includes a provision for bond default, reinvestment risk and other adverse experience. The provision for adverse deviations as measured on a replicating portfolio basis is equivalent to an increase in liabilities of approximately 2.6%.

With respect to the replicating portfolio scenario, the benefit cashflows have been created assuming the same mortality experience as the going concern actuarial valuation. Specifically we have used the 2014 Canadian Pensioners' Private Sector Mortality Table (CPM2014Priv) with generational mortality using improvement scale

CPM-B (CPM Table). Sample rates can be found in Table 1 of Section 6A. As discussed in Section 6A, these rates include a margin for mortality improvement and longevity risk. The margin as measured on a replicating portfolio basis is equivalent to an increase in liabilities of approximately 1.5%.

Annuity Purchases

In this scenario, it was assumed that, in the event of Plan windup, annuities would be purchased in respect of retired participants and beneficiaries of retired participants and all active and inactive participants who are eligible for immediate retirement at the actuarial valuation date.

The cost of any such annuities was estimated based on economic conditions in effect at the actuarial valuation date. An interest rate of 3.05% per annum and mortality rates from the 2014 CPM Mortality Table (Combined) with generational mortality projection using mortality projection Scale CPM-B (sex distinct rates) were used to estimate the cost of these annuities. These rates were established in accordance with the Canadian Institute of Actuaries ("CIA") Standards of Practice - General Standards and are based on the research conducted by the CIA Committee on Pension Plan Financial Reporting (Education Note of March 2018). The guidance suggests that the annuity purchase rate depends on the duration of the liabilities. The duration of the liabilities to be settled via a non-indexed annuity is 11.77.

Lump Sum Transfer Values

Where annuities were not assumed to be purchased, or a replicating portfolio created, as per the foregoing, it was assumed that the commuted value payable in the event of a Plan windup would be the lump sum transfer amount payable on an individual termination of employment, in lieu of a deferred pension payable from the Plan.

Lump sum transfer amounts were determined in accordance with the CIA Standards of Practice for Pension Commuted Values (i.e. Section 3500 of the CIA Standards of Practice - Practice-Specific Standards for Pension Plans, revised March 31, 2015) as applicable to terminations occurring in January 2018 resulting in discount rates of 2.80% per annum for 10 years and 3.30% per annum thereafter and mortality rates from the 2014 CPM Mortality Table (Combined) with generational mortality projection using mortality projection Scale CPM-B (sex distinct rates).

Earnings Increases

No allowance was made for future increases in earnings.

Retirement Age

Depending on the participants' status at date of actuarial valuation, we have employed the following retirement age assumptions to calculate benefits (except for active participants who elect ERIP, where members retire immediately, actuarial equivalence will be calculated from the ages below):

- for active participants who elect ERIP – date of severance
- for other active participants – age 65
- for disabled participants – age 65
- terminated vested and transferred to management participants – age 65

Disability

No provision was made for disability after the actuarial valuation date.

Termination

It was assumed that all participants terminate at the actuarial valuation date, with full vesting of accrued benefits.

Settlement Method

In the prior actuarial valuation, we assumed only 50% of active and inactive participants who are eligible for immediate retirement at the actuarial valuation date would have annuities purchased on their behalf. Although making this assumption maximized the solvency liabilities of the Plan and could be considered permissible per Section 16(5) of the Plan text, it is inconsistent with how the trustees would likely administer the benefits if a plan termination were to occur. Therefore we have changed our assumption for our current actuarial valuation to assume that 100% of active and inactive participants who are eligible for immediate retirement at the valuation date would have annuities purchased on their behalf.

Voluntary Contribution Account

We have assumed that all participants who have a Voluntary Contribution Account balance at the time of their retirement will choose to purchase additional benefits under the Plan. This assumptions is consistent with the Plan's recent experience.

Benefits subject to consent

Upon receipt of consent from the Board of Trustees, participants are eligible to receive pension benefits inclusive of the early retirement subsidies upon retirement from the Plan.

For purposes of valuing benefit liabilities, it was assumed that consent is not provided and therefore the cost of providing such early retirement subsidies has been excluded from the actuarial liabilities.

Solvency Actuarial Valuation Actuarial Methods

Assets

Assets deemed to be available for purposes of the solvency actuarial valuation are equal to:

i) the market value of assets in the Fund, adjusted for any receivables or payables; plus
ii) the present value of admissible special payments as defined under the Regulation to the PBSA-85, discounted using the assumed interest rates of the solvency actuarial basis; less
iii) windup expenses.

Liabilities

The Accrued Benefit Actuarial Cost Method was used to determine the solvency liabilities. Under this method, for each Plan participant, the accrued actuarial liabilities are determined as the present value of all benefits accrued to the actuarial valuation date.

Total solvency liabilities are compared with the assets deemed to be available to cover such liabilities to determine the solvency of the Plan at the actuarial valuation date.

Benefits Valued

The benefits valued were based on the Plan provisions applicable on Plan termination in effect at date of actuarial valuation, including the benefit improvements granted effective January 1, 2018 and April 1, 2018. On Plan termination, consent is not granted to members for the subsidized early retirement provisions. Actuarial equivalent reductions are employed.

No allowance was made for subsequent benefit increases granted or improvements implemented, if any, under the Plan after the actuarial valuation date.

Section 7: Summary of Plan provisions including improvements and amendments up to January 1, 2018

The following section provides a <u>summary</u> of Plan provisions only. For a complete listing of the provisions and terms, the Plan document should be referenced.

I. Effective Date and Eligibility

The Effective Date of the Plan was January 1, 1973. Prior to January 1, 1975, the Plan was called the Federation of Telephone Workers of British Columbia Supplemental Retirement Plan. Effective December 31, 1978, O.K. Tel Plan participants became Participants in this Plan.

All employees shall become Participants in accordance with the collective agreement.

II. Definitions

1. Annualized Earnings

Beginning with 2008, a Participant's Annualized Earnings for the calendar year is the amount equal to the Participant's Earnings divided by the Participant's Credited Service accumulated during the calendar year.

2. Average Annual Earnings

Beginning with 2009, a Participant's Average Annual Earnings for the calendar year is the amount, on January 1, of that calendar year, that is the lessor of:

(a) The average of the Participant's Earnings over the three calendar years preceding that January 1; and

(b) The product of 260.89 multiplied by the average of the Participant's Daily Rate on December 31 for each of the three years immediately preceding that January 1.

3. Average Annualized Earnings

Beginning with 2009, a Participant's Average Annualized Earnings is the amount, on each January 1, that is the lessor of:

(a) The average of the Participant's Annualized Earnings over the three calendar years preceding that January 1; and

(b) The product of 260.89 multiplied by the average of the Participant's Daily Rate as of December 31 for each of the three years immediately preceding that January 1.

4. Disability Pension Commencement Date

Prior to September 1, 1990

A Participant who becomes totally and permanently disabled as hereinafter defined may retire on a Disability Pension Commencement Date which may be the first day of any month prior to his sixty-fifth (65th) birthday and subsequent to the date the Trustees determine such Participant to be totally and permanently disabled.

Subsequent to September 1, 1990

A Participant who becomes totally and permanently disabled as hereinafter defined may retire on a Disability Pension Commencement Date which may be the first day of any month prior to his sixtieth (60th) birthday or his attainment of twenty-five (25) years of Service, whichever is the later, provided such date is prior to his sixty-fifth (65th) birthday and subsequent to the date the Trustees determine such Participant to be totally and permanently disabled.

5. Early Pension Commencement Date

i) A Participant who has attained the age of fifty-five (55) years or who has attained the age of fifty (50) years and who has attained thirty (30) years of Pension Eligibility Service or more may retire on the benefit described in paragraph III(2)(ii) of this Section 7.

ii) On written application to and with the consent of the Trustees a Participant who has either attained the age of sixty (60) years or who has both attained the age of fifty-five (55) years and has twenty-five (25) years of Pension Eligibility Service or more may retire on the benefit described in paragraph III(2)(i) of this Section 7.

iii) On written application to and with the consent of the Trustees a Participant who has attained the age of fifty (50) years and who has attained thirty (30) years of Pension Eligibility Service or more may retire on the benefit described in paragraph III(2)(iii) of this Section 7.

iv) On written application to and with the consent of the Trustees a Participant who has attained the age of fifty-five (55) years but who has not attained the age of sixty (60) years has not attained twenty-five (25) years of Pension Eligibility Service may retire on the benefit described in paragraph III(2)(iv) of this Section 7.

Upon satisfying any one of the above described conditions, a Participant may retire as of the first day of any calendar month following the date his service with the Company ceases.

The granting of consent by the Trustees shall be on a non-discriminatory basis. However, if the Trustees receive or anticipate the receipt of a series of applications for consent for early retirement under this Section 7 which result from or are based on an ERIP the Trustees shall consider the financial and actuarial implications of granting or continuing to grant consent for early retirement and determine whether or not such applications for early retirement should be granted.

6. Normal Pension Commencement Date (Pensionable Age)

The Normal Pension Commencement Date of a Participant shall be the first day of any month coinciding with or following the date upon which the Participant has attained his sixty-fifth (65th) birthday, but not later than December 1 of the year in which the Participant attains age 71.

7. Pension Eligibility Service

Pension Eligibility Service is equal to the full calendar months of Covered Employment with an Employer, expressed in calendar years and a fraction of a calendar year.

8. Voluntary Contribution Account

The Voluntary Contribution Account is equal to the total of a Participant’s Voluntary Contributions plus interest on those contributions. Upon retirement, a Participant must either use their Voluntary Contribution Account balance to purchase additional pension benefit payments or transfer the balance out of the Plan.

III. Amount of Benefits

1. Retirement Benefit

Every Participant who retired at his Normal Pension Commencement Date prior to January 1, 2018, was provided an annual Retirement Benefit, payable monthly, in accordance with the terms of this Plan or the O.K. Tel. Plan as was applicable at the date he retired.

Upon retirement at his Normal Pension Commencement Date, on or after January 1, 2018 each Participant shall be entitled to receive an annual Retirement Benefit, payable monthly, equal to the sum of:

i) twenty-five percent (25%) of the total of the Participant's Required Contributions made to The Federation of Telephone Workers of British Columbia Supplemental Retirement Plan prior to January 1, 1975,

PLUS

ii) the larger of either one and three-quarters percent (1¾%) of the Participant's Average Annual Earnings as of January 1, 2018 times his years of Past Service or the Participant's Former Plan Benefit,

PLUS

iii) one and three-quarters percent (1¾%) times the Participant's years of accrued Credited Service as of January 1, 1995 multiplied by his Average Annual Earnings at January 1, 2018,

PLUS

iv) one and three-quarters percent (1¾%) times the Participant's years of accrued Credited Service subsequent to December 31, 1994 as of January 1, 2018 multiplied by his Average Annualized Earnings at January 1, 2018,

PLUS

v) one and three-quarters percent (1¾%) of the Participant's Earnings during each Plan year subsequent to January 1, 2018.

Disabled Participants as of January 1, 2018 shall also have their annual Retirement Benefits computed in accordance with the foregoing paragraphs.

In no event shall a Disabled Participant's or Participant's Retirement Benefit under item (ii) above be less than his Retirement Benefit under such item (ii) at December 31, 2017 nor shall the Retirement Benefit under items (iii) and (iv) above combined be less than his accrued Retirement Benefit under such paragraphs (iii), (iv) and (v) combined as existed at December 31, 2017.

In determining the Retirement Benefit payable to a Disabled Participant at retirement there shall be deducted from the Retirement Benefit computed in accordance with this paragraph the amount, if any, of the annual benefit being paid to such Disabled Participant by the Company on a life annuity basis on account of his disability.

A Former Participant will be entitled to a Retirement Benefit in accordance with the provisions of the Plan applicable at the date of termination of employment with the Company.

2. Early Retirement Benefit

A Participant who retires at an Early Pension Commencement Date shall receive an annual Retirement Benefit, payable monthly, calculated as follows:

i) If the Participant has attained the age of sixty (60) years or has both attained the age of fifty-five (55) years and has twenty-five (25) years of Pension Eligibility Service or more and has received the consent of the Trustees, in accordance with paragraph II(3)(ii) of this Section 7, to retire at an Early Pension Commencement Date, the full amount of the Participant's Retirement Benefit shall become payable.

ii) If the Participant does not satisfy the provisions of paragraph (i) of this subsection or has not received the consent of the Trustees to retire at an Early Pension Commencement Date then the Actuarial Equivalent of his Retirement Benefit shall become payable.

iii) If the Participant has attained the age of fifty (50) years and has thirty (30) years of Pension Eligibility Service or more and has received the consent of the Trustees, in accordance with paragraph II(3)(iii) of this Section 7, to retire at an Early Pension Commencement Date, then the Actuarial Equivalent of his Retirement Benefit, calculated on the basis that it is due to commence without reduction on the first day of the month following his attainment of age fifty-five (55), shall become payable.

iv) If the Participant has attained the age of fifty-five (55) years but has not attained the age of sixty (60) and has less than twenty-five (25) years of Pension Eligibility Service and has received the consent of the Trustees, in accordance with paragraph II(3)(iv) of this Section 7, to retire at an Early Pension Commencement Date, then the Actuarial Equivalent of his Retirement Benefit calculated on the basis that it is due to commence without reduction on the first day of the month following his attainment of age sixty (60), shall become payable.

Pursuant to the requirements of the *Income Tax Act (Canada)* and the Regulations thereto any Retirement Benefit payable pursuant to paragraphs (ii) or (iv) of this subsection shall not exceed an amount that is equal to the Retirement Benefit reduced by one-quarter of one percent (0.25%) for each month between the first day of the month that the Retirement Benefit commences payment and the earliest of the first day of the month following the attainment of age sixty (60), the first day of the month following the attainment of thirty (30) years of Continuous Service, assuming the Participant continued to be employed and the first day of the month following the attainment of eighty (80) points, where age is added to years of Continuous Service and assuming the Participant continued to be employed.

Such Retirement Benefit, payable in the normal form shall commence as of the applicable Early Pension Commencement Date.

3. Disability Retirement Benefit

Commencing from January 1, 1992, all disability pensions in payment as at December 31, 1991 and future disability benefits will be payable under the LTD Plan. No disability benefits will be payable under the Plan on and after January 1, 1992 irrespective of a Participant's date of disability.

While disabled, the Participant continues to accrue credits on the basis of the rate of earnings he would be receiving had he not become disabled. A Disabled Participant shall be deemed to have recovered from total and permanent disability, as that term is used in this Plan, on the earliest of the following dates:

For a Disabled Participant whose date of disability was prior to September 1, 1990:

i) the date that the Disabled Participant ceases to be entitled to disability benefits under the Canada Pension Plan;

ii) the date the Disabled Participant is determined by the Trustees not to be totally and permanently disabled; and

iii) the first day of the month coinciding with or next succeeding his sixty-fifth (65th) birthday (at this date he would be eligible to retire).

For a Disabled Participant whose date of disability was subsequent to September 1, 1990:

i) the date that the Disabled Participant ceases to be entitled to disability benefits under the Canada Pension Plan;

ii) the date that the Disabled Participant is determined by the Trustees not to be totally and permanently disabled; and

iii) the latest of: the first day of the month coinciding with or next succeeding the Disabled Participant's sixtieth (60th) birthday, the first day of the month coinciding with or next succeeding his attainment of twenty-five (25) years of Service, the date that he ceases to be eligible to receive a disability benefit or disability loan under the Telecommunication Workers Employee Life and Health Trust, and the date he ceases to be eligible to receive disability payments from the Company's Disability and Death Benefits Plan; provided such date is not later than the first day of the month next following his sixty-fifth (65th) birthday.

4. Termination of Membership Benefit

A Participant may elect a refund of his Voluntary Contribution Account, if any, with interest at any time.

Upon termination prior to July 1, 2011, before completion of two (2) years of Pension Eligibility Service, a refund shall be paid of the Participant's Required Contributions, with credited interest, and the Voluntary Contribution Account, if any, with interest.

A Participant who has terminated after February 12, 1987 but before July 1, 2011 and has completed two (2) years of Pension Eligibility Service or more, or after June 30, 2011 with any amount of Pension Eligibility Service, may not elect a refund of his Required Contributions, with credited interest, at his date of termination but may elect a refund of his Voluntary Contribution Account, if any. Such a Participant shall become a Former Participant and will be entitled to a deferred Retirement Benefit commencing at his Normal Pension Commencement Date equal to the sum of his Retirement Benefit accrued to his date of termination plus any amounts provided under paragraph III(7) of this Section 7. A Participant who becomes a Former Participant before reaching age fifty-five (55), who is neither a Management Transferee nor a person who contributions to a TELUS defined contribution plan, may transfer the Actuarial Equivalent Value of the Retirement Benefit to another plan or other permitted retirement vehicle. A Participant who is transferred to non-bargaining unit employment may not elect a refund of his Required Contributions, with credited interest, but may elect a refund of his Voluntary Contribution Account, if any, and his rights and benefits under the Plan shall be determined upon the subsequent termination of his employment.

Each Participant who elected to terminate employment with the Company in accordance with the 2002-2003 My Future Choice voluntary departure incentive program or the Voluntary Departure Incentive Program pursuant to the Collective Agreement ratified in 2005 and who has been reported by the Company as having received a payment in accordance with the VDIP option shall become an Incented Terminated Participant. Effective January 1, 2002, Former Participants shall include Incented Terminated Participants. Unless otherwise indicated, Incented Terminated Participants shall be treated the same as Former Participants.

Early Retirement of a Former Participant

A Former Participant entitled to a deferred Retirement Benefit may elect to commence his Retirement Benefit prior to his Normal Pension Commencement Date in accordance with the early retirement provisions of paragraph III(2) of this Section 7.

Notwithstanding the above, an Incented Terminated Participant may elect to commence his Retirement Benefit prior to his Normal Pension Commencement Date provided that such Retirement Benefit is determined as the Actuarial Equivalent of the deferred Retirement Benefit commencing at the Incented Terminated Participant's Normal Pension Commencement Date plus any amounts provided under paragraph III(7) of this Section 7.

5. Death Benefit after July 30, 2011

Before Retirement – A Participant's, Disabled Participant's or Former Participant's beneficiary shall be paid such Participant's Voluntary Contribution Account, if any, at such Participant's date of death and, depending on his age and years of Pension Eligibility Service and marital status at his date of death, a regular benefit payment or a lump sum refund, described as follows:

i) Prior to attaining age fifty-five (55) – his surviving spouse/beneficiary/estate shall be paid the commuted value of the Retirement Benefit, including any amounts provided under paragraph III(7) of this Section 7, as if he had terminated employment on his date of death. An additional benefit shall be paid to a surviving non-spouse beneficiary, if one was designated on or before February 12, 1987;

ii) After attaining age fifty-five (55) with a surviving spouse – his surviving spouse shall be paid a regular monthly benefit equal to that which the spouse would receive with respect to the Retirement Benefit, including any amounts provided under paragraph III(7) of this Section 7, had he retired, with the consent of the Trustees, on the first day of the month following his date of death on the joint and survivor option with one hundred percent (100%) continuance to the joint annuitant. An additional benefit shall be paid to a surviving non-spouse beneficiary, if one was designated on or before February 12, 1987;

iii) After attaining age fifty-five (55) and without a surviving spouse – his beneficiary or estate shall be paid the Actuarial Equivalent Value of the Retirement Benefit, including any amounts provided under paragraph III(7) of this Section 7, had he retired, with the consent of the Trustees, on the first day of the month following his date of death on the life annuity guaranteed for fifteen (15) years option.

Notwithstanding the above, the death benefit payable under sub-paragraphs (ii) and (iii) above in respect of an Incented Terminated Participant shall be calculated as if he had retired without the consent of the Trustees on the first day of the month following his date of death.

After Retirement – the Retired Participant's beneficiary is entitled to benefits in accordance with the Retired Participant's elected form of retirement income.

6. Normal Form of Retirement Benefit

The normal form of Retirement Benefit under the Plan shall be one providing for monthly retirement benefit payments for the remaining lifetime of the Retired Participant with the provision that, should the Retired Participant die after his Retirement Benefit has commenced but before he has received sixty (60) payments thereof, the said payments shall be continued to his designated beneficiary until sixty (60) payments in all, including monthly payments made to the Retired Participant, shall have been made. If the Retired Participant's death occurs after sixty (60) monthly payments have been made, all payments shall cease after the payment immediately preceding the Retired Participant's death.

7. Minimum Benefit on and after July 1, 2011 for Retirement, Termination and Pre-Retirement Death

On and after July 1, 2011, a Participant, Disabled Participant or Former Participant shall have his Retirement Benefit increased, where such increment is the sum of:

i) the Actuarial Equivalent of the excess, if any, of his Required Contributions, with credited interest, over 50% of the Actuarial Equivalent of his Retirement Benefit, and

ii) Actuarial Equivalent of the excess, if any, of his Required Contributions, with credited interest, over the Actuarial Equivalent of his Retirement Benefit plus the amount, if any, in paragraph III(7)(i) of this Section 7.

IV. Contributions

1. Participant

Required Contributions

Participants are required to contribute based on their age as follows:

- Under age 30 – 3% of gross earnings
- Age 30 or older but under 40 – 4% of gross earnings
- Age 40 or older but under 50 – 5% of gross earnings
- Age 50 or over – 6% of gross earnings

Disabled Participants are not required to contribute to the Plan.

Voluntary Contributions

Participants are permitted to make additional voluntary contributions up to the maximum permitted under the Income Tax Act. A participant may elect a refund of his Voluntary Contribution Account at any time.

2. Employer

The Employers make contributions of 10% of earnings to the Pension Plan in accordance with the Collective Agreement.

The Employer is not required to make contributions to the Plan for Disabled Participants.

Section 8: Summary and reconciliation of membership data

Membership data as at January 1, 2018 was based on the information supplied by the Employer and records maintained under the Plan by the Plan Administrator, which provides name, sex, date of birth, date of participation, years of credited service, covered earnings and other applicable details for active participants, disabled participants, terminated vested participants, transfer to management participants, retired participants, beneficiaries and survivors.

We were also provided with the auditor’s financial report prepared as at the actuarial valuation date.

We have reviewed the data and compared it to the data used in the prior actuarial valuation for consistency and reliability for use in this actuarial valuation. The main tests of sufficiency and reliability which were conducted on the membership data were as follows:

- a review of consistency of individual data items and statistical summaries between current and prior actuarial valuations;
- a review of reasonableness of individual data items, statistical summaries and changes in such information since the prior actuarial valuation;
- a comparison of the membership data and the auditor’s financial statements for consistency;
- a reconciliation of Plan membership status from the prior actuarial valuation to the current actuarial valuation.

The data and information provided, with the exception of the financial statement, were unaudited. Some clarifications and verifications on certain data and information were made during the process of our review.

Summary of Data

Various summaries of the membership data entering the actuarial valuation and membership movements since the last actuarial valuation are set out in the following tables:

A. Active Participants

a) Overall Summary

	At January 1, 2018			At January 1, 2015		
	Males	Females	Combined	Males	Females	Combined
Number of Participants	2,243	1,275	3,518	2,417	1,609	4,026
Average Age[1]	42.7	42.7	42.7	44.1	43.5	43.9
Average Required Contribution Account Balance[2]	$ 41,699	$ 35,188	$ 39,339	$ 49,128	$ 37,598	$ 44,520
Average Voluntary Contribution Account Balance	$ 1,195	$ 1,047	$ 1,141	$ 1,031	$ 666	$ 885
Average Years of Past Service	0.0	0.0	0.0	0.0	0.0	0.0
Average Years of Accrued Membership Service[3]	12.5	12.9	12.6	15.1	14.4	14.8
Average Estimated Pensionable Earnings[4,5]	$ 73,332	$ 63,116	$ 69,630	$ 74,293	$ 61,422	$ 69,149
Average Accrued Pension	$ 15,758	$ 14,048	$ 15,138	$ 17,755	$ 14,504	$ 16,456

1 Age is calculated to be age nearest birthday at actuarial Valuation Date.

2 Adjusted to include Supplemental and Purchased Contributions.

3 Adjusted to include years of Supplemental and Purchased Service.

4 Estimated 2015 pensionable earnings are the Annualized 2014 pensionable earnings increased by 3%, further adjusted by the ratio of expected variable pay of 5% to the average variable pay received in 2014.

5 Estimated 2018 pensionable earnings are the Annualized 2017 earnings increased by 3%, further adjusted by the ratio of expected variable pay of 5% to the average total of variable pay and lump sum received in 2017.

b) Active Participants – Data Distributed by Quinquennial Age Group as at January 1, 2018

Age[1] Group	Number of Participants	Years of Past Service	Years of Membership Service[2]	Annual Supplemental Past Service Benefit Credit	Annual Accrued Past Service Benefit Credit	Annual Accrued Membership Service Benefit Credit[3]	Microtel Accrued Service Benefit Offset	Required Contribution Account Balance[4]	Voluntary Contribution Account Balance	Average Estimated Annualized 2018 Pensionable Earnings[5]
Males										
15-19	1	-	-	$ -	$ -	$ 191	$ -	$ 328	$ -	$ 39,984
20-24	47	-	76	-	-	75,248	-	129,258	1,870	54,108
25-29	213	-	614	-	-	675,873	-	1,155,786	13,525	60,523
30-34	371	-	1,944	-	-	2,338,633	-	4,507,378	131,893	68,334
35-39	377	-	2,591	-	-	3,253,237	-	7,018,043	207,050	72,375
40-44	278	-	2,449	-	-	3,123,792	-	7,445,770	345,600	76,027
45-49	234	-	2,839	-	-	3,552,873	-	9,086,967	327,809	74,282
50-54	270	-	5,041	-	-	6,418,507	1,282	17,850,717	523,809	80,252
55-59	320	-	8,555	-	-	10,971,429	3,139	31,228,082	940,787	80,134
60-64	115	5	3,308	119	6,029	4,211,806	-	12,880,440	186,293	79,474
65-69	16	9	531	166	12,147	688,143	-	2,157,726	1,074	83,950
70-74	1	-	20	-	-	21,072	-	70,798	-	61,995
TOTAL	2,243	14	27,968	$ 285	$ 18,176	$ 35,330,804	$ 4,421	$ 93,531,293	$ 2,679,710	$ 73,332
Females										
15-19	1	-	1	$ -	$ -	$ 625	$ -	$ 1,075	$ -	$ 45,409
20-24	41	-	54	-	-	47,795	-	81,597	-	47,804
25-29	187	-	642	-	-	656,020	-	1,109,963	-	58,945
30-34	213	-	987	-	-	1,051,115	-	1,990,909	4,402	63,308
35-39	119	-	705	-	-	772,364	-	1,661,071	37,536	64,571
40-44	95	-	692	-	-	757,655	-	1,753,653	16,228	63,808
45-49	164	-	2,399	-	-	2,606,215	-	6,296,200	123,721	62,506
50-54	177	-	3,757	-	-	4,069,029	-	10,528,369	213,842	65,634
55-59	204	-	5,385	-	-	5,984,209	10,664	15,677,970	669,743	65,911
60-64	61	1	1,514	6	1,786	1,703,972	-	4,821,633	269,763	66,478
65-69	13	-	263	-	-	271,664	-	941,645	-	64,986
TOTAL	1,275	1	16,399	$ 6	$ 1,786	$ 17,920,663	$ 10,664	$ 44,864,085	$ 1,335,235	$ 63,116
GRAND TOTAL	3,518	15	44,367	$ 291	$ 19,962	$ 53,251,467	$ 15,085	$ 138,395,378	$ 4,014,945	$ 69,630

1 Age is calculated to be age nearest birthday at actuarial Valuation Date.

2 Adjusted to include years of Supplemental and Purchased Service.

3 Adjusted to include Supplemental and Purchased Benefit Credits.

4 Adjusted to include Supplemental and Purchased Contributions.

5 Estimated 2018 pensionable earnings are the Annualized 2017 pensionable earnings increased by 3%, further adjusted by the ratio of expected variable pay of 5% to the average total of variable pay and lump sum received in 2017.

B. Disabled Participants (in receipt of monthly disability benefit payments under the LTD Plan as at January 1, 2018, and continuing to accrue pension benefit credits under the Plan)

a) Overall Summary

	At January 1, 2018			At January 1, 2015		
	Males	Females	Combined	Males	Females	Combined
Number of Participants	94	178	272	111	184	295
Average Age[1]	54.9	52.7	53.5	54.2	52.8	53.3
Average Required Contribution Account Balance[2]	$ 54,300	$ 30,568	$ 38,769	$ 57,456	$ 31,460	$ 41,241
Average Voluntary Contribution Account Balance	$ 794	$ 509	$ 607	$ 490	$ 391	$ 428
Average Years of Past Service	0.0	0.0	0.0	0.1	0.2	0.1
Average Years of Accrued Membership Service[3]	27.0	23.4	24.6	26.6	24.2	25.1
Average Estimated Earnings at Valuation Date[4,5]	$ 62,972	$ 54,596	$ 57,491	$ 63,919	$ 55,045	$ 58,384
Average Accrued Pension	$ 30,366	$ 22,516	$ 25,229	$ 28,889	$ 22,315	$ 24,788

1 Age is calculated to be age nearest birthday at actuarial Valuation Date.

2 Adjusted to include Supplemental and Purchased Contributions.

3 Adjusted to include years of Supplemental and Purchased Service.

4 Estimated 2015 pensionable earnings are the Annualized 2014 pensionable earnings increased by 3%, further adjusted by the ratio of expected variable pay of 5% to the average variable pay received in 2014.

5 Estimated 2018 pensionable earnings are the Annualized 2017 earnings increased by 3%, further adjusted by the ratio of expected variable pay of 5% to the average total of variable pay and lump sum received in 2017.

b) Disabled Participants – Data Distributed by Quinquennial Age Group as at January 1, 2018

Age[1] Group	Number of Participants	Years of Past Service	Years of Membership Service[2]	Annual Supplemental Past Service Benefit Credit	Annual Accrued Past Service Benefit Credit	Annual Accrued Membership Service Benefit Credit[3]	Microtel Accrued Service Benefit Offset	Required Contribution Account Balance[4]	Voluntary Contribution Account Balance	Average Estimated Annualized 2018 Pensionable Earnings[5]
Males										
25-29	1	-	1	$ -	$ -	$ 1,018	$ -	$ 1,076	$ -	$ 43,101
30-34	3	-	32	-	-	37,565	-	55,106	-	70,629
35-39	3	-	18	-	-	16,621	-	19,905	-	54,611
40-44	4	-	53	-	-	58,993	-	107,353	-	62,310
45-49	8	-	139	-	-	143,467	-	123,721	13,363	57,588
50-54	12	-	260	-	-	268,549	-	348,388	-	57,778
55-59	27	-	790	-	-	887,840	2,800	1,576,794	3,553	63,625
60-64	32	1	1,102	9	688	1,286,998	-	2,720,046	57,701	66,629
65-69	4	3	140	26	3,445	151,989	-	151,827	-	61,819
TOTAL	94	4	2,535	$ 35	$ 4,133	$ 2,853,040	$ 2,800	$ 5,104,216	$ 74,617	$ 62,972
Females										
25-29	2	-	4	$ -	$ -	$ 2,922	$ -	$ 2,327	$ -	$ 42,304
30-34	4	-	29	-	-	28,607	-	38,857	-	54,447
35-39	8	-	46	-	-	42,572	-	42,063	-	53,370
40-44	16	-	194	-	-	188,622	-	210,498	-	55,297
45-49	21	-	369	-	-	344,080	-	403,487	-	53,159
50-54	33	-	761	-	-	713,841	-	852,287	13,525	53,751
55-59	63	-	1,818	-	-	1,734,450	-	2,439,917	77,047	54,638
60-64	31	2	946	-	2,151	950,539	-	1,451,582	-	57,153
TOTAL	178	2	4,167	$ -	$ 2,151	$ 4,005,633	$ -	$ 5,441,018	$ 90,572	$ 54,596
GRAND TOTAL	272	6	6,702	$ 35	$ 6,284	$ 6,858,673	$ 2,800	$ 10,545,234	$ 165,189	$ 57,491

[1] Age is calculated to be age nearest birthday at actuarial Valuation Date.

[2] Adjusted to include years of Supplemental and Purchased Service.

[3] Adjusted to include Supplemental and Purchased Benefit Credits.

[4] Adjusted to include Supplemental and Purchased Contributions.

[5] Estimated 2018 pensionable earnings are the Annualized 2017 pensionable earnings increased by 3%, further adjusted by the ratio of expected variable pay of 5% to the average total of variable pay and lump sum received in 2017.

C. Former Participants

a) Terminated Vested (Including Pending Terminations)

i) Overall Summary

	At January 1, 2018			At January 1, 2015		
	Males	Females	Combined	Males	Females	Combined
Number of Participants	659	1,222	1,881	617	1,380	1,997
Average Age[1]	45.7	50.3	48.7	46.8	49.9	48.9
Average Required Contribution Account Balance[2]	$ 17,369	$ 18,534	$ 18,126	$ 21,637	$ 20,240	$ 20,672
Average Voluntary Contribution Account Balance	$ 245	$ 137	$ 175	$ 216	$ 168	$ 1,830
Average Accrued Benefit at Valuation Date[3]	$ 6,281	$ 6,491	$ 6,417	$ 7,548	$ 7,160	$ 7,280

[1] Age is calculated to be age nearest birthday at actuarial Valuation Date.

[2] Adjusted to include Supplemental and Purchased Contributions.

[3] Average Accrued Benefit doesn't include excess pension due to 50% rule.

ii) *Data Distributed by Quinquennial Age Group as at January 1, 2018*

Age[1] Group	Number of Participants	Years of Past Service	Years of Membership Service[2]	Annual Supplemental Past Service Benefit Credit	Annual Accrued Past Service Benefit Credit	Annual Accrued Membership Service Benefit Credit[3]	Microtel Accrued Service Benefit Offset	Required Contribution Account balance[4]	Voluntary Contribution Account Balance	Excess Pension Due to 50% Cost Rule[5]
Males										
20-24	8	-	2	$ -	$ -	$ 1,764	$ -	$ 3,035	$ -	$ -
25-29	35	-	84	-	-	85,914	-	149,845	-	2,844
30-34	76	-	224	-	-	221,436	-	412,004	12,838	12,543
35-39	79	-	295	-	-	312,713	-	661,703	10,065	15,189
40-44	83	-	351	-	-	345,021	-	815,826	34,703	79,826
45-49	101	-	585	-	-	515,140	-	1,383,327	155	194,792
50-54	144	-	1,440	-	-	1,379,828	-	4,005,716	41,319	282,234
55-59	100	-	1,079	-	-	997,640	2,911	3,101,742	62,197	230,930
60-64	23	-	295	2	-	269,851	-	871,696	-	39,698
65-69	3	-	15	16	-	12,379	-	41,602	-	3,753
70-74	1	-	-	97	-	-	-	-	-	-
75 & Over	6	-	-	580	-	-	-	-	-	-
Total	659	-	4,370	$ 695	$ -	$ 4,141,686	$ 2,911	$ 11,446,496	$ 161,277	$ 861,809
Females										
20-24	5	-	7	$ -	$ -	$ 6,364	$ -	$ 11,159	$ -	$ 13
25-29	31	-	68	-	-	64,958	-	113,292	-	323
30-34	81	-	218	-	-	205,518	-	363,096	-	6,858
35-39	48	-	99	-	-	88,611	-	172,758	-	10,702
40-44	90	-	383	-	-	320,044	-	728,333	-	114,026
45-49	189	-	1,419	-	-	1,122,925	372	2,968,730	-	521,563
50-54	278	-	2,459	-	-	1,894,000	1,782	5,420,761	117,632	726,914
55-59	406	-	4,764	-	-	3,329,475	5,273	9,962,959	40,014	910,785
60-64	82	2	1,189	13	1,625	864,054	-	2,771,275	10,097	122,658
65-69	7	-	37	57	-	41,429	-	135,641	-	6,328
70-74	1	-	-	74	-	-	-	-	-	-
75 & Over	4	-	-	303	-	-	-	-	-	-
Total	1,222	2	10,643	$ 447	$ 1,625	$ 7,937,378	$ 7,427	$ 22,648,004	$ 167,743	$ 2,420,170
GRAND TOTAL	1,881	2	15,013	$ 1,141	$ 1,625	$ 12,079,064	$ 10,338	$ 34,094,500	$ 329,020	$ 3,281,979

[1] Age is calculated to be age nearest birthday at actuarial Valuation Date.

[2] Adjusted to include years of Supplemental and Purchased Service.

[3] Adjusted to include Supplemental and Purchased Benefit Credits.

[4] Adjusted to include Supplemental and Purchased Contributions.

[5] Determined at the Date of Termination.

b) Transferred to Management

i) Overall Summary

	At January 1, 2018			At January 1, 2015		
	Males	**Females**	**Combined**	**Males**	**Females**	**Combined**
Number of Participants	380	334	714	375	312	687
Average Age[1]	43.4	44.0	43.7	42.7	44.6	43.6
Average Required Contribution Account Balance[2]	$ 21,244	$ 19,517	$ 20,437	$ 22,757	23,710	$ 23,190
Average Voluntary Contribution Account Balance	$ 44	$ 75	$ 59	$ 20	$ 20	$ 20
Average Accrued Benefit at Valuation Date	$ 7,785	$ 7,377	$ 7,594	$ 8,229	$ 8,820	$ 8,497

[1] Age is calculated to be age nearest birthday at actuarial Valuation Date.

[2] Adjusted to include Supplemental and Purchased Contributions.

ii) *Data Distributed by Quinquennial Age Group as at January 1, 2018*

Age[1] Group	Number of Participants	Years of Past Service	Years of Membership Service[2]	Annual Supplemental Past Service Benefit Credit	Annual Accrued Past Service Benefit Credit	Annual Accrued Membership Service Benefit Credit[3]	Microtel Accrued Service Benefit Offset	Required Contribution Account Balance	Voluntary Contribution Account
Males									
25-29	15	-	42	$ -	$ -	$ 40,783	$ -	$ 72,817	$ -
30-34	56	-	226	-	-	237,758	-	448,831	505
35-39	65	-	302	-	-	317,250	-	671,733	3,655
40-44	72	-	347	-	-	349,570	-	837,314	3,833
45-49	72	-	501	-	-	498,892	-	1,323,389	4,905
50-54	52	-	566	-	-	567,318	-	1,708,550	3,869
55-59	37	-	685	-	-	777,311	-	2,425,275	-
60-64	9	-	146	-	-	155,913	-	531,077	-
65-69	2	-	14	-	-	13,342	-	53,850	-
Total	380	-	2,829	$ -	$ -	$ 2,958,137	$ -	$ 8,072,836	$ 16,767
Females									
25-29	22	-	67	$ -	$ -	$ 64,905	$ -	$ 114,987	$ -
30-34	58	-	228	-	-	221,536	-	407,402	11,201
35-39	40	-	151	-	-	146,029	-	309,353	-
40-44	43	-	261	-	-	231,344	-	547,295	-
45-49	54	-	437	-	-	380,447	-	1,022,716	-
50-54	64	-	807	-	-	717,816	-	2,052,498	6,239
55-59	40	-	607	-	-	524,963	5,135	1,534,519	7,578
60-64	12	2	185	6	1,966	174,098	-	503,611	-
65-69	1	-	7	-	-	5,833	-	26,458	-
Total	334	2	2,750	$ 6	$ 1,966	$ 2,466,971	$ 5,135	$ 6,518,839	$ 25,018
GRAND TOTAL	714	2	5,579	$ 6	$ 1,966	$ 5,425,108	$ 5,135	$ 14,591,675	$ 41,785

[1] Age is calculated to be age nearest birthday at actuarial Valuation Date.

[2] Adjusted to include years of Supplemental and Purchased Service.

[3] Adjusted to include Supplemental and Purchased Benefit Credits.

D. Retired Participants

a) Overall Summary

	At January 1, 2018			At January 1, 2015		
	Males	Females	Combined	Males	Females	Combined
Number of Participants[1]	4,486	3,903	8,389	4,223	3,496	7,719
Average Age[2]	70.2	68.6	69.5	69.2	67.9	68.6
Average Annual Pension at Valuation Date	$ 26,232	$ 18,696	$ 22,728	$ 25,918	$ 18,594	$ 22,601
Average Annual Pension at April 1, 2018	$ 26,940	$ 19,152	$ 23,316	$ N/A	$ N/A	$ N/A

b) Data Distributed by Quinquennial Age Group as at January 1, 2018[3]

Age Group	Number of Participants	Total Monthly Benefit on January 1, 2018	Average Monthly Benefit on January 1, 2018	Total Monthly Benefit Effective April 1, 2018	Average Monthly Benefit Effective April 1, 2018
Under 55	11	$ 15,879	$ 1,444	$ 15,899	$ 1,445
55-59	726	1,853,754	2,553	1,864,796	2,569
60-64	1,777	4,388,918	2,470	4,480,441	2,521
65-69	2,244	4,344,281	1,936	4,473,286	1,993
70-74	1,585	2,604,554	1,644	2,693,284	1,700
75-79	921	1,284,471	1,395	1,329,301	1,444
80-84	619	820,802	1,326	849,530	1,372
85-89	360	424,431	1,179	439,286	1,220
90 & Over	147	149,556	1,017	154,791	1,053
TOTAL	8,389	$ 15,886,646	$ 1,894	$ 16,300,614	$ 1,943

[1] Duplicate Records are combined for this summary. (Duplicate records are due to voluntary account balances being converted into additional benefits upon retirement.)

[2] Age is calculated to be age nearest birthday at actuarial Valuation Date.

[3] Including 239 Limited Members at 1-1-15 and 266 Limited Members at 1-1-18.

E. Beneficiaries

a) Overall Summary

	At January 1, 2018			At January 1, 2015		
	Males	Females	Combined	Males	Females	Combined
Number of Participants	4	3	7	4	5	9
Average Age[1]	66.8	65.0	66.0	68.0	60.8	64.0
Average Annual Pension at Valuation Date	$ 22,296	$ 31,356	$ 26,184	$ 19,682	$ 31,962	$ 26,504
Average Annual Pension at April 1, 2018	$ 22,944	$ 32,460	$ 27,024	$ N/A	$ N/A	$ N/A

b) Data Distributed by Quinquennial Age Group as at January 1, 2018

Age Group	Number of Participants	Total Monthly Benefit on January 1, 2018	Average Monthly Benefit on January 1, 2018	Total Monthly Benefit Effective April 1, 2018	Average Monthly Benefit Effective April 1, 2018
60-64	2	$ 5,272	$ 2,636	$ 5,446	$ 2,723
65-69	4	7,330	1,833	7,551	1,888
70-74	1	2,672	2,672	2,765	2,765
TOTAL	7	$ 15,274	$ 2,182	$ 15,762	$ 2,252

[1] Age is calculated to be age nearest birthday at actuarial Valuation Date.

F. Survivors

a) Overall Summary

	At January 1, 2018			At January 1, 2015		
	Males	Females	Combined	Males	Females	Combined
Number of Participants	123	621	744	91	534	625
Average Age[1]	71.5	75.1	74.5	69.9	73.4	72.9
Average Annual Pension at Valuation Date	$ 10,296	$ 14,844	$ 14,100	$ 9,372	$ 14,366	$ 13,639
Average Annual Pension at April 1, 2018	$ 10,596	$ 15,348	$ 14,556	$ N/A	$ N/A	$ N/A

b) Data Distributed by Quinquennial Age Group as at January 1, 2018

Age Group	Number of Participants	Total Monthly Benefit on January 1, 2018	Average Monthly Benefit on January 1, 2018	Total Monthly Benefit Effective April 1, 2018	Average Monthly Benefit Effective April 1, 2018
Under 55	16	$ 13,717	$ 857	$ 13,915	$ 870
55-59	37	48,455	1,310	49,685	1,343
60-64	54	71,995	1,333	73,918	1,369
65-69	115	162,499	1,413	167,830	1,459
70-74	138	169,648	1,229	175,538	1,272
75-79	143	170,829	1,195	176,808	1,236
80-84	123	128,136	1,042	132,620	1,078
85-89	80	79,038	988	81,804	1,023
90 & Over	38	29,625	780	30,662	807
Total	744	$ 873,942	$ 1,175	$ 902,780	$ 1,213

[1] Age is calculated to be age nearest birthday at actuarial Valuation Date.

Reconciliation of Membership Data

	Active	Terminated[1,2] Vested	Transferred	Disabled	Retired	Beneficiaries	Survivors
At Jan. 1, 2015 including duplicate records	4,026	1,997	687	295	8,086[3]	9	630[4]
Net adjustment made after actuarial valuation date:	3	(1)		1	(7)		
New Entrants:	922						
Terminated:							
• Deferred vested	(362)	442	(76)	(4)			
• Lump sum settlement/non vested	(197)	(138)	(10)				
• Bridged Records that were Combined with Current Service Record		(4)					
Transferred:	(175)		175				
Disabled:	(76)			76			
Retired:							
• New Retiree	(645)	(393)	(61)	(55)	1,154		
• New Limited Member					40		
• Duplicated records					50		
Deceased:							
• With a Survivor Benefit	(4)	(5)		(7)	(169)		185
• GTD benefit continued					(6)	6	
• Without residual benefit					(354)		(60)
• Lump sum settlement	(7)	(5)		(3)	(28)		
• Others[5]					(3)		1
Total	(11)	(10)		(10)	(560)	6	126
Benefit Payment Expired:						(8)	
Returned to Active Status:	33	(1)	(1)	(31)			
At Jan. 1, 2018 including duplicate records	3,518	1,892	714	272	8,763[6]	7	756[7]
At Jan. 1, 2018 without duplicate records	3,518	1,881	714	272	8,389	7	744

[1] Including 28 participants at 1-1-15 with double records and 11 participants at 1-1-18 with multiple records.
[2] Not including 434 non-vested Participants and untraced terminated vested Lives not in the Penfax system.
[3] Including 239 Limited Members and 367 duplicate records. Duplicate records are due to voluntary account balances being converted into additional benefits upon retirement.
[4] Including 5 duplicate records. Duplicate records are due to voluntary account balances being converted into additional benefits upon retirement.
[5] Unable to locate beneficiaries/LM pension ended due to death of retired participant/pension reverted to retired participant due to death of LM/LM became survivor on death of retired participants.
[6] Including 266 Limited Members and 374 duplicate records. Duplicate records are due to voluntary account balances being converted into additional benefits upon retirement.
[7] Including 12 duplicate records. Duplicate records are due to voluntary account balances being converted into additional benefits upon retirement.

Appendix A: Plan administrator certification

I hereby certify that, to the best of my knowledge and belief, for the purposes of the actuarial valuation:

i) the membership data provided to PBI Actuarial Consultants Ltd. for the January 1, 2018 actuarial valuation of the Telecommunication Workers Pension Plan, as summarized in Section 8 of this report, is accurate and complete; and

ii) the Summary of Plan Provisions contained in Section 7 of this report is an accurate and complete summary of the terms of the Plan in effect on January 1, 2018; and

iii) all events that may have an impact on the results of the actuarial valuation, including any events which may have occurred subsequent to the actuarial valuation date, have been communicated to PBI Actuarial Consultants Ltd.

TELECOMMUNICATION WORKERS PENSION PLAN

June 26/2018
Date

Signature

Debbie Ellis
Name

Administrator
Title