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January 26, 2018

BY E-MAIL

PRIVATE & CONFIDENTIAL

Ms. Cindy Veinot
Office of the Provincial Controller Division
Treasury Board Secretariat
2nd Floor, Frost Building South
7 Queen's Park Crescent
Toronto, ON M7A 1Y7

RE: PUBLIC SERVICE PENSION PLAN
RESPONSE TO MINISTRY OF FINANCE REQUEST FOR FINANCIAL INFORMATION AS OF DECEMBER 31, 2017

Dear Ms. Veinot:

This letter provides the information requested in a letter dated December 5, 2017 from Mr. Alex Killoch.

Methodology and Assumptions

We prepared an actuarial valuation of the obligations under the Public Service Pension Plan ("PSPP") as of December 31, 2016 based on:

- The data provided to us as of December 31, 2016 by the Ontario Pension Board ("OPB").
- The projected benefit cost method prorated on service.
- The demographic assumptions as outlined in Appendix A.
- The economic assumptions as outlined in the letter of December 5 and as summarized below:

Economic Assumption	Basis 1 (per year)	Basis 2 (per year)	Basis 3 (per year)
Inflation	2.00%	2.00%	2.00%
Increase in Salaries (before promotional scale)	2.00% until 2019; 2.75% thereafter	2.00% until 2019; 2.75% thereafter	2.00% until 2019; 2.50% thereafter
Investment Return			
Nominal Return	5.75%	5.50%	5.75%
Real Return	3.75%	3.50%	3.75%

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The obligations as of December 31, 2016 have been extrapolated to December 31, 2017 based on the following:

- Estimated service cost during the period from December 31, 2016 to December 31, 2017.
- The benefit payments in 2017 provided by OPB in an e-mail dated January 26, 2018.
- The asset transfers from other plans and past service buy-backs in 2017, as provided by OPB in an email dated January 26, 2018. It has been assumed that these give rise to an obligation of an equivalent amount.

2017 Cash Flow

The 2017 cash flow items provided in OPB's e-mail of January 26, 2018 are provided below:

		(000's)
Member Contributions		
▪ Current Service	$	309,753
▪ Past Service		38,393
▪ Total	$	348,146
Employer Contributions		
▪ Current Service	$	309,613
▪ Past Service		4,098
▪ Total	$	313,711
Employer Additional Current Service Cost	$	43,308
Employer Special Payments	$	98,988
Transfers From Other Plans	$	137,509
Benefit Payments		
▪ Pension Payments	$	1,175,117
▪ Termination Payments and Transfers		147,889
▪ Total	$	1,323,006

Reconciliation of Actuarial Present Value of Accrued Pension Benefits

For purposes of the reconciliations presented below, we were informed that "Basis 3" provided in the previous year's request was used for the previous year's reporting and this has become "Basis 1" in the current year's reporting.

The following is a reconciliation of the actuarial present value of accrued pension benefits ("accrued pension benefits") from December 31, 2016 ("Basis 3") to December 31, 2017 ("Basis 1"):

		(000's)
Accrued Pension Benefits as at December 31, 2016		**$ 24,934,973**
Increase in Accrued Pension Benefits		
▪ Interest on Accrued Pension Benefits and Service Accrual	$ 1,419,814	
▪ Benefits Accrued:		
– Service Accrual (mid-year)	657,886	
– Transfer of Assets From Other Plans and Past Service Buy-Backs	180,000	
▪ Other Experience Losses	274,879	
▪ Net Impact of Change in Actual Assumptions	572,561	
Total Increase		$ 3,105,140
Decrease in Accrued Pension Benefits		
▪ Benefits Paid	$ 1,323,006	
Total Decrease		$ 1,323,006
Accrued Pension Benefits as at December 31, 2017		**$ 26,717,107**

The Service Accrual has been projected to 2018 based on an increase in payroll of 3.00% (the assumed rate of salary increase including promotional scale) from 2017 to 2018. On this basis, the 2018 Service Accrual would be $690,398,000.

For 2018, the expected member contributions are $333,283,000 based on the current contribution rates and the expected increase in contribution rates effective April 1, 2018.

For Basis 2 and Basis 3, the changes in economic assumptions from Basis 1 used for the current year's reporting will impact the "Net Impact of Change in Actuarial Assumptions" line in the above reconciliation and the "Accrued Pension Benefits as of December 31, 2017". The following table shows the revised figures for each basis:

Economic Assumptions	**Net Impact of Change in Actuarial Assumptions (000's)**	**Accrued Pension Benefits as of December 31, 2017 (000's)**	**Service Accrual for 2018 (000's)**
Basis 2	$ 1,502,283	$ 27,646,829	$ 727,012
Basis 3	$ 448,991	$ 26,593,537	$ 680,070

In the above table, the "Net Impact of Change in Actuarial Assumptions" would be an increase in the accrued benefits for all bases.

Present Value of Future Accruals

The requirements letter included a request for the present value of future accruals for service and the present value of future required employee contributions. These have been determined, under each basis, by assuming that the estimated amounts for 2018 will increase in future years in line with increases in salaries (excluding the promotional scale). This method assumes the population remains stable over time (ie. the age and service characteristics are unchanged). The resulting future values were discounted to December 31, 2017 at the nominal investment return applicable to each basis. The following table shows the present value of future service accruals as well as the present value of future employee contributions as of December 31, 2017 for each basis:

Economic Assumptions	**Present Value of Future Service Accruals (000's)**	**Present Value of Future Employee Contributions (000's)**
Basis 1	$ 23,497,798	$ 11,996,961
Basis 2	$ 26,961,047	$ 13,073,908
Basis 3	$ 21,416,677	$ 11,098,775

Expected Average Remaining Service Lifetime

The expected average remaining service lifetime as of December 31, 2017 is 11.0 years.

Market Value of Assets

The Market Value of Asset as of December 31, 2017 will be provided under separate cover.

Changes in Actuarial Assumptions

The actuarial assumptions are summarized in Appendix A. The only demographic change was updating the mortality table to the CPM 2014 Combined Mortality Table, with rates adjusted 105% for males and 110% for females, and allowance for future mortality improvement projected generationally from 2014 with mortality improvement scale MI-2017.

Certifications

We hereby certify that in our opinion:

- The data provided to us by the OPB are sufficient and reliable;
- The assumptions used are appropriate for purposes of the valuation; emerging experience differing from the assumptions will result in gains or losses, which will be revealed in future valuations; and
- The methods used are appropriate for purposes of the valuation and are consistent with the applicable requirements.

The letter has been prepared, and our opinions given, in accordance with accepted actuarial practice.

If you require any additional information, please call us.

Sincerely,

Andrew M. Hamilton, FCIA, FSA

Jonathan Skan, FCIA, FSA

Encl.

cc: Mr. Alex Killoch, Ministry of Finance
Mr. Allan Shapira, Aon Hewitt

Appendix A: Actuarial Assumptions

Economic Assumptions	**Basis 1 (per year)**	**Basis 2 (per year)**	**Basis 3 (per year)**
Increase in Consumer Price Index	2.00%	2.00%	2.00%
Increase in Year's Maximum Pensionable Earnings	2.75%	2.75%	2.50%
Increase in Maximum Pension Under *Income Tax Act* (after actual increase in 2016)	2.75%	2.75%	2.50%
Increase in Salaries (plus promotional scale below)			
2017–2019	2.00%	2.00%	2.00%
2020 +	2.75%	2.75%	2.50%
Investment Return			
Nominal Rate	5.75%	5.50%	5.75%
Real Rate	3.75%	3.50%	3.75%
Commuted Value Interest Rate	2.50%	2.50%	2.50%

Appendix A: Actuarial Assumptions

Economic Assumptions (continued)

Promotional Scale for Increase in Salaries

All Plan Members Other Than OPP Officers		OPP Officers	
Attained Age (yrs)	**Promotional Increase**	**Completed Service (yrs)**	**Promotional Increase**
20 – 26	7.50%	1	4.00%
27	6.50%	2	3.60%
28	5.50%	3	3.20%
29	4.50%	4	2.90%
30 – 31	3.50%	5	2.60%
32	2.50%	6	2.30%
33 – 40	1.00%	7	2.00%
41 – 48	0.25%	8	1.80%
49+	0.00%	9	1.60%
		10	1.40%
		11	1.20%
		12 – 15	1.00%
		16 – 20	0.50%
		21+	0.00%

Appendix A: Actuarial Assumptions

Demographic Assumptions

Retirement Rates[1]

All Plan Members Other Than OPP Officers and Justices of the Peace

Age	Eligible for Unreduced Pension*	Eligible for Reduced Pension**
First Unreduced Age	40%	N/A
55	25%	4%
56	25%	4%
57	25%	4%
58	25%	4%
59	25%	7%
60	25%	7%
61	20%	7%
62	20%	7%
63	20%	7%
64	45%	15%
65	100%	N/A

* Age 60 or over with 20 or more years of pension credit or age plus pension credit totaling 90 or more.

** No reduced retirement assumed within one year of first unreduced retirement age.

[1] Retirement rates do not reflect the Factor 80 early retirement program for surplus employees in effect for specified groups

Appendix A: Actuarial Assumptions

Demographic Assumptions (continued)

Retirement Rates[1]

OPP Officers

Age	Eligible For Unreduced Pension*	Eligible For Reduced Pension**
First Unreduced Age	60%	N/A
50	25%	N/A
51	25%	N/A
52	25%	N/A
53	25%	N/A
54	25%	N/A
55	25%	4%
56	25%	4%
57	25%	4%
58	25%	4%
59	25%	7%
60	25%	7%
61	20%	7%
62	20%	7%
63	20%	7%
64	45%	15%
65	100%	100%

* Age 50 or over with 30 or more years of pension credit or age 60 or over with 20 or more years of pension credit or age plus pension credit totalling 90 or more.

** No reduced retirement assumed within one year of first unreduced retirement age.

[1] Retirement rates do not reflect the Factor 80 early retirement program for surplus employees in effect for specified groups

Appendix A: Actuarial Assumptions

Demographic Assumptions (continued)

Retirement Rates (continued)

Justices of the Peace

Age	**Eligible for Unreduced Pension Before Age 65**	**Not Eligible for Unreduced Pension Before Age 65**
First Unreduced Age	33%	33%
Ages Following First Unreduced Age up to and Including Age 65 (per year)	10%	N/A
Ages 66 to 70 (per year)	15%	15%
Age 71	100%	100%

Appendix A: Actuarial Assumptions

Demographic Assumptions (continued)

Withdrawal Rates

All Plan Members Other Than OPP Officers

Completed Service (yrs)	Annual Rate
<3	12%
3	10%
4	9%
5 – 6	8%
7	7%
8	6%
9 – 11	5%
12 – 13	4%
14 – 19	3%
20+	2%

OPP Officers

Completed Service (yrs)	Annual Rate
<1	6%
1 – 3	3%
4 – 5	2%
6 – 10	2%
11 – 12	2%
13 – 14	1%
15 – 20	1%
21+	1%

Appendix A: Actuarial Assumptions

Demographic Assumptions (continued)

Mortality Rates	CPM 2014 Combined Mortality Table, with rates adjusted 105% for males and 110% for females Allowance for future mortality improvement projected generationally from 2014 with mortality improvement scale MI-2017.
Percentage With a Spouse	
Non-retired Members	87% of males and 52% of females are assumed to have a spouse at retirement or death; female spouses assumed to be 3 years younger than member and male spouses assumed to be same age as member.
Retired Members	Actual marital status and spouse's birth date.