

Actuarial Valuation as at December 31, 2013

Halifax Regional Municipality Pension Plan

Registration Number: 238063

September 12, 2014

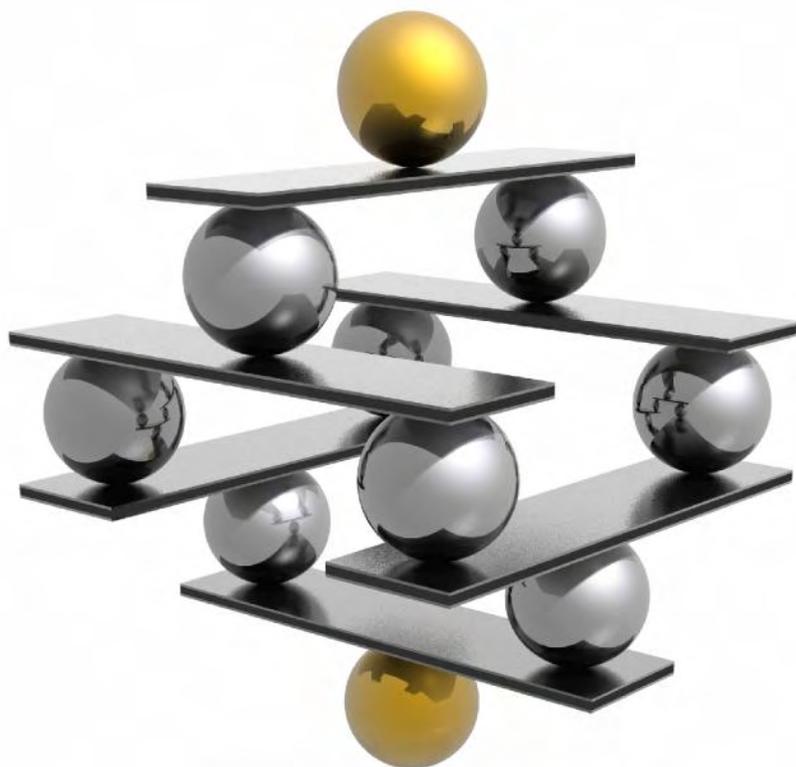


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Executive Summary

An actuarial valuation has been prepared for the Halifax Regional Municipality Pension Plan (the "Plan") as at December 31, 2013 for the primary purpose of establishing a funding recommendation for the Plan until the next actuarial valuation is performed. This section provides an overview of the important results and the key valuation assumptions which have had a bearing on these results. As this valuation indicates a ratio of solvency assets to solvency liabilities of less than 0.85, the next required valuation will be as at December 31, 2014 as prescribed by the Nova Scotia *Pension Benefits Act*.

Summary of Principal Results

| | December 31, 2013 | | December 31, 2012 | |
|----------------------------|-------------------------|-------------------------|-------------------------|-------------------------|
| | Going Concern | Solvency | Going Concern | Solvency |
| Assets | \$1,296,325,000 | \$1,389,455,000 | \$1,209,583,000 | \$1,295,309,000 |
| Liabilities | <u>1,503,738,000</u> | <u>1,869,010,000</u> | <u>1,423,518,000</u> | <u>1,994,919,000</u> |
| Surplus/(Deficit) | \$ (207,413,000) | \$ (479,555,000) | \$ (213,935,000) | \$ (699,610,000) |
| Funded / Transfer Ratio | 86.2% | 69.2% | 85.0% | 60.5% |

Contribution Requirements

The overall contribution rate requirements recommended in this report is shown in the following table.

| | |
|---|--------------|
| Current service cost | 17.5% |
| Deficit amortization - established from 31-Dec-2009 valuation | 1.5% |
| Deficit amortization - established from 31-Dec-2012 valuation | 4.8% |
| Deficit amortization – accelerated payment | <u>0.1%</u> |
| Total | 23.9% |

Executive Summary

Key Assumptions

The principal assumptions to which the valuation results are most sensitive are outlined in the following table.

| | December 31, 2013 | | December 31, 2012 | |
|-----------------------------|--|--|---|--|
| | Going Concern | Solvency | Going Concern | Solvency |
| Discount rate | 6.50% | Annuity purchases: 3.0% Transfers: 2.4% for 10 years, 3.6% thereafter | 6.25% | Annuity purchases: 3.0% Transfers: 2.4% for 10 years, 3.6% thereafter |
| Inflation rate | 2.25% | n/a | 2.25% | n/a |
| Pensionable earnings | 1.50% at 1-Jan-2014, 3.00% thereafter | n/a | 3.00% | n/a |
| Mortality table | CPM 2014 Private (unadjusted) with mortality improvements in accordance with Scale B | UP94 with generational improvements in accordance with Scale AA | UP94 with generational improvements in accordance with Scale AA | UP94 with generational improvements in accordance with Scale AA |
| Retirement rates | 60% at earliest unreduced retirement age, remainder at normal retirement date | Earliest unreduced age | 60% at earliest unreduced retirement age, remainder at normal retirement date | Earliest unreduced age |

Section 1: Introduction

Purpose and Terms of Engagement

We have been engaged by Halifax Regional Municipality Pension Committee and hereafter referred to as "HRM" to conduct an actuarial valuation of the Plan as at December 31, 2013 for the general purpose of determining the minimum funding contributions required by pension standards, based on the actuarial assumptions and methods summarized herein. More specifically, the purposes of the valuation are to:

- Determine the financial position of the Plan on a going concern basis as at December 31, 2013;
- Determine the financial position of the Plan on a solvency basis as prescribed by the Nova Scotia *Pension Benefits Act* (the "PBA"), as at December 31, 2013;
- Determine the funding requirements of the Plan as at December 31, 2013 with the understanding that such funding is to exclude amounts relating to any solvency deficiency as defined by the PBA; and
- Provide the necessary actuarial certification required under the PBA and the *Income Tax Act*.

The results of this report may not be appropriate for accounting purposes or any other purposes not listed above.

While we have been engaged by HRM to conduct this actuarial valuation, we note that the users of our work may well extend to parties external to HRM, notably the provincial and federal pension regulators and the plan members. Out of respect for the HRM's confidentiality, however, we shall not undertake to communicate the terms of our engagement or results of our work with such other users unless so directed by HRM.

As this valuation indicates a ratio of solvency assets to solvency liabilities of less than 0.85, the next required valuation will be as at December 31, 2014 as prescribed by the PBA.

Information and Inputs

In order to prepare our valuation, we have relied upon the following information:

- Membership data compiled as at December 31, 2013;
- Asset data taken from the Plan's audited financial statements; and
- A copy of the latest plan text and amendments up to and including Amendment 2013-01.

Furthermore, our actuarial assumptions and methods have been chosen to reflect our understanding of HRM's desired funding objectives with due respect to accepted actuarial practice and regulatory constraints.

Section 1: Introduction

Subsequent Events

As of the date of this report, we have not been made aware of any subsequent events which would have an effect on the results of this valuation. However, the following points should be noted in this regard:

- Actual experience deviating from expected after December 31, 2013 will result in gains or losses which will be reflected in the next actuarial valuation report; and
- To the best of our knowledge, the results contained in this report are based on the regulatory and legal environment in effect at the date of this report and do not take into consideration any potential changes that may be currently under review. To the extent that actual changes in the regulatory and legal environment transpire, any financial impact on the Plan as a result of such changes will be reflected in future valuations.

Section 2: Going Concern Valuation Results

Going Concern Financial Position of the Plan

The going concern valuation provides an assessment of the Plan's financial position at the valuation date on the premise that the Plan continues on into the future indefinitely.

The selection of the applicable actuarial assumptions and methods reflect the Plan's funding objectives, as communicated by HRM, actuarial standards of practice, and pension standards.

On the basis of the plan provisions, membership data, going concern assumptions and methods, and asset information described in the Appendices, the going concern financial position of the Plan as at December 31, 2013 is shown in the following table. The results as at December 31, 2012 are also shown for comparison purposes.

Going Concern Financial Position

| | December 31, 2013 | December 31, 2012 |
|--|--------------------------------|--------------------------------|
| Assets | | |
| Market value of assets | \$ 1,331,549,000 | \$ 1,211,130,000 |
| Actuarial asset smoothing amount | <u>(35,224,000)</u> | <u>(1,547,000)</u> |
| Total value of assets | \$ 1,296,325,000 | \$ 1,209,583,000 |
| Actuarial liabilities | | |
| Active and disabled members | \$ 703,250,000 | \$ 717,905,000 |
| Inactive members and deferred pensioners | 21,228,000 | 15,920,000 |
| Pensioners and survivors | 749,685,000 | 665,175,000 |
| Defined contribution accounts | 24,400,000 | 22,363,000 |
| Transfer deficiency holdbacks ¹ | <u>5,175,000</u> | <u>2,155,000</u> |
| Total actuarial liabilities | \$ 1,503,738,000 | \$ 1,423,518,000 |
| Surplus / (unfunded liability) | <u>\$ (207,413,000)</u> | <u>\$ (213,935,000)</u> |
| Going-concern funded ratio | 86.2% | 85.0% |

¹ The December 31, 2009 and December 31, 2012 valuations respectively revealed a transfer ratio of 80.9% and 60.5%. The amount shown on the balance sheet represents the total solvency transfer deficiency holdbacks as at December 31, 2013 for all members who transferred their entitlement out of the Plan subsequent to the filing of the December 31, 2009 and December 31, 2012 valuations.

Section 2: Going Concern Valuation Results

Change in Financial Position

During the period from December 31, 2012 to December 31, 2013, the going concern financial position of the Plan changed from an unfunded liability of \$213,935,000 to an unfunded liability of \$207,413,000. The major components of this change are summarized in the following table.

Reconciliation of the Going Concern Financial Position For the Period from December 31, 2012 to December 31, 2013

| | |
|---|--------------------------------|
| Surplus/(Unfunded Liability) as at December 31, 2012 | \$ (213,935,000) |
| Expected interest on surplus (unfunded liability) | (13,371,000) |
| Total special payments made in inter-valuation period with interest | <u>10,737,000</u> |
| Expected Surplus/(Unfunded Liability) as at December 31, 2013 | \$ (216,569,000) |
| | |
| Change in liabilities due to experience gains/(losses) | |
| Gain/(loss) from investment earnings greater/lower than expected | 19,753,000 |
| Gain/(loss) due to retirement experience | (1,953,000) |
| Gain/(loss) due to salary increases lower/greater than expected | 3,860,000 |
| Gain/(loss) due to active decrement experience other than retirement | (2,213,000) |
| Gain/(loss) due to pensioner mortality experience | (1,334,000) |
| Gain/(loss) due to data adjustments to previous valuation | (26,939,000) |
| Net gain/(loss) due to other experience and miscellaneous items | <u>(3,003,000)</u> |
| Surplus/(Unfunded Liability) after experience gains/(losses) as at December 31, 2013 | \$ (228,398,000) |
| Change in liabilities due to change in assumptions | 20,985,000 |
| Change in liabilities due to plan amendments | <u>0</u> |
| Surplus/(Unfunded Liability) as at December 31, 2013 | <u>\$ (207,413,000)</u> |

Section 2: Going Concern Valuation Results

Discussion of Changes in Assumptions

Effective December 31, 2013, the following assumptions were changed:

Economic Assumption

- Discount rate assumption increased from 6.25% per annum to 6.50% per annum.
- Salary increase assumption for 2014 was assumed to be 1.5%.

In combination, these changes in assumptions decreased the going concern liabilities by \$59,387,000 and the total normal cost by 0.8% of pensionable earnings.

Demographic Assumptions

- Mortality assumption changed from Uninsured Pensioner 1994 mortality table with generational projection using scale AA to 2014 Canadian Pensioner Mortality Table for the Private Sector (unadjusted) with generational mortality improvements in accordance with CPM Improvement Scale B.

In combination, these changes in assumptions increased the going concern liabilities by \$38,402,000 and the total normal cost by 0.3% of pensionable earnings.

Going Concern Valuation Sensitivity Results

In accordance with the Canadian Institute of Actuaries Standards of Practice specific to pension plans that became effective December 31, 2010, the table below presents the sensitivity of the going concern liabilities and the total normal cost of using a discount rate 1% lower than that used for the going concern valuation.

| | Valuation Basis December 31, 2013 | Based on Rate of 1% Lower | Effect | |
|---|--|--------------------------------------|-------------------|-----------------|
| | | | Net change | % change |
| Going concern liabilities | \$ 1,503,738,000 | \$ 1,706,086,000 | \$ 202,348,000 | 13.5% |
| Normal cost as % of total pensionable earnings | 17.5% | 21.0% | 3.5% | 20.0% |

Note that using a discount rate 1% higher than that assumed would result in a comparable reduction in the Plan's going concern liabilities and normal cost.

Section 3: Solvency Valuation Results

Solvency Financial Position of the Plan

The solvency valuation is an assessment of the Plan's financial position at the valuation date on the premise that certain obligations as prescribed by the *PBA* are settled on the valuation date for all members. Specifically, the *PBA* permits the value of all escalated adjustments and "grow-in" benefits (as provided under Section 79 of the *PBA*) to be excluded from solvency liabilities. It should be noted that the *PBA* does not require the Plan to fund solvency deficits; however, it does require certain solvency related information to be disclosed in the valuation report.

On the basis of the plan provisions, membership data, solvency assumptions and methods and asset information described in the Appendices, the solvency financial position of the Plan as at December 31, 2013 is shown in the following table. The solvency financial position of the Plan as at December 31, 2012 is shown for comparison purposes.

Solvency Financial Position

| | December 31, 2013 | December 31, 2012 |
|---|-------------------------|-------------------------|
| Assets | | |
| Market value of assets | \$ 1,331,549,000 | \$ 1,211,130,000 |
| Actuarial asset smoothing amount | (35,224,000) | (1,547,000) |
| Present value of special payments for next five years | 95,130,000 | 87,726,000 |
| Estimated wind up expenses | <u>(2,000,000)</u> | <u>(2,000,000)</u> |
| Total Assets | \$ 1,389,455,000 | \$ 1,295,309,000 |
| Solvency Liabilities | | |
| Active and disabled members | \$ 884,732,000 | \$ 1,034,581,000 |
| Inactive members and deferred pensioners | 32,246,000 | 28,241,000 |
| Pensioners and survivors | 922,457,000 | 907,579,000 |
| Defined contribution accounts | 24,400,000 | 22,363,000 |
| Transfer deficiency holdbacks ¹ | <u>5,175,000</u> | <u>2,155,000</u> |
| Total Liabilities | \$ 1,869,010,000 | \$ 1,994,919,000 |
| Solvency Surplus/(Deficiency) | \$ (479,555,000) | \$ (699,610,000) |
| Transfer Ratio | 69.2% | 60.5% |

¹ The December 31, 2009 and December 31, 2012 valuations respectively revealed a transfer ratio of 80.9% and 60.5%. The amount shown on the balance sheet represents the total solvency transfer deficiency holdbacks as at December 31, 2013 for all members who transferred their entitlement out of the Plan subsequent to the filing of the December 31, 2009 and December 31, 2012 valuations.

Section 3: Solvency Valuation Results

Transfer Ratio

The Transfer Ratio is the ratio of the solvency assets (excluding the present value of special payments) to the solvency liabilities. If the Transfer Ratio is less than 1.0, certain conditions and restrictions, as prescribed by the PBA, must be applied to the transfer of the commuted value of benefits from the plan. Generally, the PBA requires that when the Transfer Ratio is less than 1, the Transfer Ratio must be applied to commuted values before they are transferred from the Plan with any balance of the commuted value being transferred within the ensuing five year period.

The Transfer Ratio is determined as follows:

| | \$ |
|---|---------------|
| Solvency assets (excluding the present value of special payments) | 1,294,325,000 |
| Solvency liabilities | 1,869,010,000 |
| Ratio | 69.2% |

Since the ratio of the solvency assets to the solvency liabilities is less than 1.0 as at December 31, 2013 the above restrictions on transfers do apply.

Solvency Valuation Sensitivity Results

In accordance with the Canadian Institute of Actuaries Standards of Practice specific to pension plans that became effective December 31, 2010, the table below presents the sensitivity of the solvency liabilities to using a discount rate of 1% lower than that used for the solvency valuation.

| | Valuation Basis December 31, 2013 | Based on Rate of 1% Lower | Effect | |
|----------------------|--------------------------------------|------------------------------|----------------|-------|
| | | | \$ | % |
| Solvency liabilities | \$ 1,869,010,000 | \$ 2,156,997,000 | \$ 287,987,000 | 15.4% |

Note that using a discount rate 1% higher than that assumed would result in a comparable reduction in the solvency wind up liabilities.

Incremental Cost on a Solvency Basis

The incremental cost on a solvency basis represents the present value at December 31, 2013 of the expected aggregate change in the solvency liabilities between December 31, 2013 and the next calculation date, December 31, 2014. Appendix D gives more details on the calculation methodology and on assumptions.

Based on this methodology and on these assumptions, the incremental cost on a solvency basis, for the period from December 31, 2013 to December 31, 2014 is \$105,217,000.

Section 4: Contribution Requirements

Contribution Requirements in Respect of the Normal Cost

The annual going concern cost of benefits in respect of service accruing after the valuation date is known as the normal cost. The dollar normal cost for benefits accruing in 2014 is estimated to be \$53,487,000. When applied to the estimated 2014 pensionable earnings on which contributions are expected to be made of \$305,260,000, the resulting normal cost contribution rate is 17.5%.

The normal cost contribution rate is expected to remain relatively level as a percentage of pensionable earnings provided the demographics of the Plan's active membership remain constant from year to year. The dollar normal cost amount is expected to increase each year at the assumed growth in pensionable earnings attributed to inflation and productivity or 3.00% per annum.

The normal cost rate at the previous valuation was 17.3%. An analysis of the change in total normal cost is as follows:

| | |
|---|-------------|
| Total normal cost as at December 31, 2012 | 17.3% |
| Demographic changes | 0.3% |
| Increased employee contribution rate | 0.4% |
| Change in discount rate assumption | (0.8%) |
| Change in mortality assumption | <u>0.3%</u> |
| Total normal cost as at December 31, 2013 | 17.5% |

Section 4: Contribution Requirements

Contribution Requirements in Respect of Deficits

The amendments to the PBA regulations in 2012 and HRM's subsequent revisions to the Plan's funding policy enable contributions to fund solvency deficits to be excluded from the funding recommendation. Consequently, the funding recommendation only incorporates deficit contributions to the extent that they are necessary to fund the Plan's going-concern deficit at December 31, 2013 in accordance with the minimum requirements of the PBA.

In order to satisfy the minimum requirements of the PBA, the going-concern deficit at December 31, 2013 will need to be amortized by special payments established from three amortization schedules as follows:

- continuation of the established going-concern deficit contribution schedule of 1.8% established at December 31, 2009 where such established schedule expires December 31, 2024;
- continuation of the established going-concern deficit contribution schedule of 4.8% established at December 31, 2012 where such established schedule expires December 31, 2027; and
- if necessary, any new going-concern deficit contribution schedule commencing January 1, 2015 and ending December 31, 2028.

The contribution rate attributed to the established deficit contribution schedule is 6.6% of pensionable earnings.

The contribution rate attributed to the new schedule is determined such that the December 31, 2013 going-concern deficit is fully amortized by December 31, 2028 taking into account the Plan's established 2014 contribution rate as well as the need to continue the established amortization schedule. More specifically, the contribution rate attributed to the new schedule is determined as the level percentage of covered earnings where the present value of such additional contributions at the valuation date paid over the period January 1, 2015 through December 31, 2028 equals the December 31, 2013 going-concern deficit less:

- The present value of 1.8% of pensionable earnings from January 1, 2014 through December 31, 2024. This amount represents the present value of the continuation of the going-concern deficit contributions that was established at December 31, 2009;
- The present value of 4.8% of pensionable earnings from January 1, 2014 through December 31, 2027. This amount represents the present value of the continuation of the going-concern deficit contributions that was established at December 31, 2012; and
- The present value of 2014 contributions that will exceed the 2014 normal cost (i.e. 17.5% of pensionable earnings) and the 2014 established going-concern deficit payment of 6.6% of pensionable earnings.

As shown in the following table, the existing amortization schedules are more than sufficient to fund the unfunded liability at December 31, 2013 and hence no additional amortization schedule is necessary at this time.

Section 4: Contribution Requirements

| | |
|--|-----------------------|
| Present value of 1.8% of pensionable earnings from 1-Jan-2014 through 31-Dec-2024 (the 2009 amortization schedule) | \$ 50,765,000 |
| Present value of 4.8% of pensionable earnings from 1-Jan-2014 through 31-Dec-2027 (the 2012 amortization schedule) | 164,443,000 |
| Present value of 2014 contributions (23.9% of pensionable earnings) that will exceed the 2014 normal cost (17.5% of pensionable earnings) and the 2014 established going-concern deficit payment of 6.6% of pensionable earnings | <u>(603,000)</u> |
| Total | \$ 214,605,000 |

Consequently, the 2009 amortization schedule (i.e. 1.8% of pensionable earnings) can be reduced to 1.5% of pensionable earnings effective January 1, 2014 and the resulting amounts shown in the above table will then equal the going-concern deficit at December 31, 2013.

Excess Surplus

Excess surplus is defined in Section 147.2(2)(d) of the Income Tax Act, as the portion of surplus (if any) that exceeds 25% of the going concern liabilities. In the event of an excess surplus, the Income Tax Act and terms of the Plan require that neither employer nor member contributions will be made until such excess is eliminated.

Since the Plan has an unfunded liability, there is no excess surplus and therefore it does not impact the development of the employer contribution requirements.

Summary of Contribution Rates Effective January 1, 2015

The following table summarizes the minimum contribution rate requirements as per the PBA effective January 1, 2015

| | |
|---------------------------------|--------------|
| Current service cost | 17.5% |
| Amortization schedule from 2009 | 1.5% |
| Amortization schedule from 2012 | <u>4.8%</u> |
| Total | 23.8% |

The current aggregate contribution rate of 23.9% of pensionable earnings is therefore adequate to meet these minimum requirements commencing January 1, 2015. Based on discussions with the Pension Committee, the 0.1% difference between the current contribution rates and the minimum requirements is not significant enough to warrant a change to the current contribution rate schedule. The additional 0.1% contribution will simply serve to amortize the going-concern deficit more rapidly.

Section 4: Contribution Requirements

The following table summarizes the current contribution rate schedules by division that will continue in 2015.

| | Members | Employers |
|--|------------------------------------|------------------------------------|
| Current Plan Division | | |
| Public Safety Occupations hired after 1-Apr-1998 | 12.31% | 12.31% |
| Public Safety Occupations hired after 1-Jul-1994 under the former Halifax Plan | 12.31% | 12.31% |
| Other Public Safety Occupations who elected the "Rule of 75" | 12.66% | 11.96% |
| Other members | 11.96% | 11.96% |
| Dartmouth Plan Division | | |
| Public Safety Occupations | 11.49% | 12.63% |
| Members contributing at a lower rate | 10.19% | 11.20% |
| Other members | 11.19% | 12.30% |
| Halifax Plan Division | | |
| Public Safety Occupations hired after 1-Jul-1994 | 12.01% | 12.01% |
| Other members | 11.66% | 11.66% |
| County Plan Division | | |
| All members | 11.46% | 11.46% |
| Metro Plan Division | | |
| All members | 11.76% to 12.66% above YMPE, | 11.76% to 12.66% above YMPE, |

It should be noted that, subject to the Plan's terms, a participating employer could contribute more than the amounts described above until the time that the next funding recommendation is certified provided the aggregate contribution made by the participating employer does not exceed:

- the Plan's normal cost contribution rate of 17.5%; less
- member required contributions made by the participating employer's employees; plus
- the greater of the going-concern unfunded liability and the solvency deficiency that is attributed to the participating employer.

Such additional contributions have not been contemplated in the funding recommendation contained in this report as it is presumed that no such contributions will be made.

Section 5: Actuarial Certificate

Actuarial Opinion, Recommendations and Certification for the Halifax Municipality Pension Plan

Registration Number: 238063

This actuarial certification forms an integral part of the actuarial valuation report for the Plan as at December 31, 2013. I confirm that I have prepared an actuarial valuation of the Plan as at December 31, 2013 for the purposes outlined in the Introduction section to this report and consequently:

I hereby recommend that:

- In order to satisfy the normal cost requirements and the minimum funding requirements under the PBA, aggregate contributions that should be made to the plan until the time the next valuation report is certified are as follows:

| | |
|---|--------------|
| Current service cost | 17.5% |
| Deficit amortization - established from 31-Dec-2009 valuation | 1.5% |
| Deficit amortization - established from 31-Dec-2012 valuation | 4.8% |
| Deficit amortization – accelerated payment | <u>0.1%</u> |
| Total | 23.9% |

- As this valuation indicates a ratio of solvency assets to solvency liabilities of less than 0.85, the next required valuation will be as at December 31, 2014 as prescribed by the PBA.

I hereby certify that, in my opinion:

- With respect to the purposes of determining the Plan's financial position on a going concern basis as at December 31, 2013:
 - The Plan has a going concern unfunded liability of \$207,413,000, based on going concern assets of \$1,296,325,000 less going concern liabilities of \$1,503,738,000.
 - There is no excess surplus as defined by Section 147.2(2) of the *Income Tax Act* in the Plan.
- With respect to the purpose of determining the Plan's financial position on a solvency basis as at December 31, 2013 as prescribed by the PBA:
 - The Plan has a solvency deficiency of \$479,555,000, determined as solvency assets, net of wind up expenses, of \$1,389,455,000 which includes the present value of the next five years of minimum scheduled unfunded liability payments of \$95,130,000, less solvency liabilities of \$1,869,010,000.
 - The solvency liabilities exclude the value of all escalated adjustments and "grow-in" benefits, both as prescribed by the PBA. Consequently, if the Plan was actually terminated and wound-up on

Section 5: Actuarial Certificate

the valuation date, the Plan's liabilities and deficit would both be greater than suggested by the solvency position.

- The transfer ratio is 69.2%
- With respect to determining the funding requirements of the Plan:
 - The Plan's normal cost in the year following the valuation date and for each year thereafter until the next funding recommendation is certified is 17.5% of pensionable earnings. This amount is estimated to equal \$53,487,000 in 2014 and \$55,092,000 in 2015.
 - The special payments or deficit contributions required to amortize the going-concern unfunded liability at December 31, 2013 that meet the minimum PBA requirements after taking into account the Plan's already established 2014 contribution rate of 23.9% of pensionable earnings is as follows:

| Date Deficit Contribution Schedule Established | Date Deficit Contribution Schedule Begins | Date Deficit Contribution Schedule Ends | Deficit Contribution as % of Total Pensionable Earnings |
|---|--|--|--|
| 31-Dec-2013 | 01-Jan-2015 | 31-Dec-2028 | 0.0% |
| 31-Dec-2012 | 01-Jan-2014 | 31-Dec-2027 | 4.8% |
| 31-Dec-2009 | 01-Jan-2009 | 31-Dec-2024 | 1.5% |
| Total | | | |

- The contribution rate schedule in effect at January 1, 2014 and as summarized below is expected to be more than sufficient to satisfy the minimum funding requirements of the PBA.

| | Members | Employers |
|--|------------------------------|------------------------------|
| Current Plan Division | | |
| Public Safety Occupations hired after 1-Apr-1998 | 12.31% | 12.31% |
| Public Safety Occupations hired after 1-Jul-1994 under the former Halifax Plan | 12.31% | 12.31% |
| Other Public Safety Occupations who elected the "Rule of 75" | 12.66% | 11.96% |
| Other members | 11.96% | 11.96% |
| Dartmouth Plan Division | | |
| Public Safety Occupations | 11.49% | 12.63% |
| Members contributing at a lower rate | 10.19% | 11.20% |
| Other members | 11.19% | 12.30% |
| Halifax Plan Division | | |
| Public Safety Occupations hired after 1-Jul-1994 | 12.01% | 12.01% |
| Other members | 11.66% | 11.66% |
| County Plan Division | | |
| All members | 11.46% | 11.46% |
| Metro Plan Division | | |
| All members | 11.76% to 12.66% above YMPE, | 11.76% to 12.66% above YMPE, |

Section 5: Actuarial Certificate

- The aggregate deficit contributions for 2014 and 2015 are estimated to be \$19,902,000 and \$20,499,000 respectively.
- The participating employer contributions recommended in this report are eligible contributions under Section 147.2(2) of the *Income Tax Act*.
- For the purposes of the valuation:
 - The data on which this valuation is based are sufficient and reliable;
 - The assumptions used are appropriate; and
 - The actuarial cost methods and the asset valuation methods used are appropriate.
- This report and its associated work have been prepared, and my opinion given, in accordance with accepted actuarial practice in Canada and in compliance with the requirements outlined in subparagraphs 147.2(2)(a)(iii) and (iv) of the *Income Tax Act*.
- Notwithstanding the above certifications, emerging experience differing from the assumptions will result in gains or losses that will be revealed in subsequent valuations.

A handwritten signature in black ink, appearing to read 'Donald L. Ireland'.

Donald L. Ireland
Fellow, Society of Actuaries
Fellow, Canadian Institute of Actuaries

September 12, 2014

Appendix A: Assets

Asset Data

The Plan assets are held in trust by Northern Trust under the Halifax Regional Municipality Master Trust. The Halifax Regional Municipality Pension Plan and the Halifax Regional Water Commission Employees' Pension Plan are the only two pension plans that are part of the Halifax Regional Municipality Master Trust. The asset information presented in this report is based on the audited financial statements of the pension fund for 2013 prepared by Deloitte LLP.

Tests of the sufficiency and reliability of the asset data were performed and the results were satisfactory. The tests included a review of actual cash flow with expected cash flow from the previous actuarial report to ensure reasonability.

Market Value of Assets

The following is a summary of the composition of the Plan's assets by asset type as at December 31, 2013 as reported by Halifax Regional Municipality Annual Report.

| | December 31, 2013 | |
|------------------------------|--------------------------|---------------|
| | \$ | % |
| Cash and equivalents | \$ 6,658,000 | 0.5% |
| Fixed-income | 486,015,000 | 36.5% |
| Canadian equities | 126,497,000 | 9.5% |
| Global equities | 388,812,000 | 29.2% |
| Minimum Targeted Return | <u>323,567,000</u> | <u>24.3%</u> |
| Total Invested Assets | \$ 1,331,549,000 | 100.0% |

Appendix A: Assets

Target Asset Mix

The target asset mix of the Plan is contained in the Plan's Statement of Investment Policies and Procedures dated March 21, 2013 and is as follows:

| | Minimum | Target | Maximum |
|-------------------------|---------|-------------|---------|
| Equities | 30% | 35% | 60% |
| Fixed income | 30% | 35% | 60% |
| Minimum Targeted Return | 10% | <u>30%</u> | 40% |
| | | 100% | |

Reconciliation of Changes in Market Value of Assets

The table below reconciles changes in the market value of assets between December 31, 2012 and December 31, 2013.

| | 2013 |
|--|-------------------------|
| Beginning of Plan Year | \$ 1,211,130,000 |
| Contributions during plan year | |
| Employees | 31,690,000 |
| Participating employers | 31,729,000 |
| Transfers from other pension plans | <u>578,000</u> |
| Total | 63,997,000 |
| Benefit Payments During Plan Year | |
| Refunds and transfers to other pension plans | (8,201,000) |
| Pension benefits paid | <u>(64,149,000)</u> |
| Total | (72,350,000) |
| Administrative expenses | (6,254,000) |
| Investment income | 135,026,000 |
| End of Plan Year | \$ 1,331,549,000 |

Appendix A: Assets

Development of Actuarial Value of Assets

The asset value used to determine Plan's financial position is based on a smoothing of market investment returns over a five year period. Specifically, the market returns earned by the Plan that are above / below the assumed discount rate assumption are amortized over five years in an effort to smooth the volatility in the market value. The following table illustrates the development of the actuarial value of assets at December 31, 2013.

The development of the actuarial value of assets as of December 31, 2013 is shown below:

| Development of the Actuarial Value of Assets | | | |
|--|-------|------------------------|------------------|
| Market value of assets at December 31, 2013 | | \$ | 1,331,549,000 |
| Less: Unrecognized investment return excess/(deficiency) as compared to the discount rate assumption in effect for each year | 2013: | \$53,336,863 x 80% = | 42,669,000 |
| | 2012: | \$21,295,438 x 60% = | 12,777,000 |
| | 2011: | (\$65,145,518) x 40% = | (26,058,000) |
| | 2010: | \$29,178,126 x 20% = | <u>5,836,000</u> |
| | | | 35,224,000 |
| Actuarial value of assets at December 31, 2013 | | \$ | 1,296,325,000 |

Appendix B: Membership Data

Source of Data

This funding valuation was based on member data provided by the various participating employers as of December 31, 2013. This data was originally submitted to Aon Hewitt in its capacity as third party administrator, reviewed and refined / updated as appropriate. Membership data for this valuation was then extracted by the third party administrator and forwarded to the actuary where further tests of sufficiency and reliability were performed and the results were satisfactory. The tests included:

- A reconciliation of membership status against the membership status at the last valuation. This test was performed to ensure that all members were accounted for. A summary of this reconciliation follows on the next page;
- An examination of birth, hire, and participation dates against the corresponding dates provided for the last valuation to ensure consistency of data;
- An examination of credited service against the corresponding amount provided for the last valuation to ensure that no member accrued more than one year of credited service from December 31, 2012;
- An examination of pensionable earnings against the corresponding amounts provided for the last valuation to identify any unusual increases or decreases;
- An examination of accrued benefits against the corresponding amounts provided for the last valuation to identify any unusual benefit accruals;
- An examination of inactive member benefit amounts against the corresponding amounts provided for the last valuation to ensure consistency of data.

As a result of the tests performed, it was observed that a number of data adjustments to the membership at January 1, 2013 had been made by the third party administrator subsequent to the date of the December 31, 2012 report. These adjustments have been reflected in the membership at December 31, 2013 and the corresponding impact on the plan's going-concern financial position identified in Section 2 of this report.

Membership Reconciliation

The table below reconciles the number of members as of December 31, 2013 with the number of members as of December 31, 2012, and the changes due to experience in the period.

| | Active | Inactive and Deferreds | Pensioners/ Survivors | Total |
|------------------------------------|--------------|---------------------------|--------------------------|--------------|
| Number at December 31, 2012 | 5,627 | 435 | 3,288 | 9,350 |
| Adjustment | - | (1) | (29) | (30) |
| New entrants | 383 | 149 | 91 | 623 |
| Reactivated | 10 | (9) | (1) | - |
| To inactive / deferred | (95) | 96 | (1) | - |
| Retirements | (159) | (9) | 168 | - |
| Terminations / deaths | (121) | (82) | (54) | (257) |
| Members, December 31, 2013 | 5,645 | 579 | 3,462 | 9,686 |



Appendix B: Membership Data

Membership Summary

Active Members

| | December 31, 2013 | December 31, 2012 |
|--------------------------------------|------------------------|------------------------|
| Number | 5,645 | 5,627 |
| Average pensionable earnings rate | \$ 54,134 ¹ | \$ 53,851 ² |
| Average age | 47.1 years | 46.8 years |
| Average years of pensionable service | 11.1 years | 11.2 years |
| Proportion female | 47.3% | 46.7% |
| Accumulated member contributions | \$ 297,433,816 | \$ 284,992,873 |

Inactive and Deferred Vested Members

| | December 31, 2013 | December 31, 2012 |
|-------------------------------------|-------------------|-------------------|
| Number | 579 | 435 |
| Average age | 47.4 years | 49.4 years |
| Average annual pension ³ | \$ 5,880 | \$ 5,090 |
| Proportion female | 59.6% | 56.6% |

Pensioner and Survivor Members

| | December 31, 2013 | December 31, 2012 |
|------------------------|-------------------|-------------------|
| Number | 3,462 | 3,288 |
| Average age | 70.2 years | 70.2 years |
| Average annual pension | \$ 19,438 | \$ 18,437 |
| Proportion female | 46.7% | 46.5% |

¹ The average pensionable earnings rate is based on the actual and deemed pensionable earnings for 2013, annualized where applicable, and then increased by the general salary increase assumption of 1.5%.

² The average pensionable earnings rate is based on the actual and deemed pensionable earnings for 2012, annualized where applicable, and then increased by the general salary increase assumption of 3% plus the seniority, merit and promotional scale.

³ Excludes members for whom no pension amount was available or who are pending non-vested terminations. Contributions with interest are held as a liability for these members.

Appendix B: Membership Data

Active/Disabled Membership Distribution

The following table provides a detailed summary of the active/disabled membership at the valuation date by years of credited service and by age group.

| Age | | < 5 | 5–10 | 10–15 | 15–20 | 20–25 | 25–30 | >=30 | Total |
|----------------|------------------|----------|----------|----------|----------|----------|----------|----------|----------|
| < 25 | Count | 43 | | | | | | | 43 |
| | Average earnings | \$39,936 | | | | | | | \$39,936 |
| 25–29 | Count | 143 | 32 | | | | | | 175 |
| | Average earnings | \$44,909 | \$69,210 | | | | | | \$49,352 |
| 30–34 | Count | 237 | 155 | 10 | | | | | 402 |
| | Average earnings | \$49,340 | \$67,280 | \$67,360 | | | | | \$56,705 |
| 35–39 | Count | 245 | 217 | 103 | 13 | | | | 578 |
| | Average earnings | \$46,676 | \$64,966 | \$69,327 | \$59,441 | | | | \$57,866 |
| 40–44 | Count | 241 | 261 | 165 | 88 | 22 | | | 777 |
| | Average earnings | \$45,315 | \$58,472 | \$62,621 | \$69,135 | \$64,357 | | | 56,646 |
| 45–49 | Count | 282 | 258 | 152 | 156 | 172 | 41 | | 1,061 |
| | Average earnings | \$40,332 | \$51,764 | \$59,535 | \$65,380 | \$73,049 | \$78,177 | | \$56,312 |
| 50–54 | Count | 250 | 237 | 174 | 151 | 170 | 152 | 27 | 1,161 |
| | Average earnings | \$43,594 | \$49,123 | \$47,564 | \$58,106 | \$64,527 | \$72,257 | \$62,608 | \$54,465 |
| 55–59 | Count | 150 | 160 | 189 | 112 | 113 | 95 | 80 | 899 |
| | Average earnings | \$43,717 | \$42,574 | \$41,524 | \$55,064 | \$58,263 | \$64,849 | \$67,305 | \$50,627 |
| 60–64 | Count | 58 | 95 | 94 | 50 | 49 | 30 | 40 | 416 |
| | Average earnings | \$45,287 | \$46,184 | \$41,396 | \$50,593 | \$55,694 | \$56,262 | \$62,411 | \$48,914 |
| >=65 | Count | 19 | 25 | 26 | 30 | 14 | 5 | 14 | 133 |
| | Average earnings | \$46,887 | \$45,640 | \$41,099 | \$47,469 | \$51,389 | \$58,798 | \$42,461 | \$46,108 |
| Total | Count | 1,668 | 1,440 | 913 | 600 | 540 | 323 | 161 | 5,645 |
| | Average earnings | \$44,686 | \$55,097 | \$52,880 | \$59,918 | \$64,781 | \$69,135 | \$63,141 | \$54,134 |

Appendix B: Membership Data

Retired/Deferred Vested Membership Distribution

The following table provides a detailed summary of the retired/deferred vested membership at the valuation date by age group.

| Age | Inactive and Deferred Members | | Pensioners and Survivors | |
|--------------|-------------------------------|-------------------------------------|--------------------------|------------------------|
| | Number | Average Annual Pension ¹ | Number | Average Annual Pension |
| <25 | 4 | \$ 0 | 1 | \$ 11,322 |
| 25-29 | 26 | \$ 2,101 | | |
| 30-34 | 42 | \$ 3,682 | | |
| 35-39 | 67 | \$ 4,199 | | |
| 40-44 | 83 | \$ 5,735 | 2 | \$ 6,572 |
| 45-49 | 104 | \$ 6,393 | 3 | \$ 7,965 |
| 50-54 | 109 | \$ 6,583 | 85 | \$ 28,891 |
| 55-59 | 102 | \$ 6,516 | 367 | \$ 30,096 |
| 60-64 | 35 | \$ 5,939 | 627 | \$ 24,332 |
| 65-69 | 6 | \$ 1,175 | 815 | \$ 18,650 |
| 70-74 | 1 | \$ 0 | 588 | \$ 16,009 |
| 75-79 | | | 416 | \$ 15,194 |
| 80-84 | | | 276 | \$ 14,253 |
| 85-89 | | | 180 | \$ 12,905 |
| 90-94 | | | 83 | \$ 13,406 |
| 95+ | | | 19 | \$ 9,694 |
| Total | 579 | \$ 5,880 | 3,462 | \$ 19,438 |

¹ Excludes members for whom no pension amount was available or who are pending non-vested terminations. Contributions with interest are held as a liability for these members.

Appendix C: Going Concern Assumptions and Methods

Assumptions and Methods

A member's entitlements under a pension plan are generally funded during the period over which service is accrued by the member. The cost of each member's benefits is allocated in some fashion over the member's service. An actuarial valuation provides an assessment of the extent to which allocations relating to periods prior to a valuation date (often referred to as the actuarial liabilities) are covered by the plan's assets.

The going concern valuation provides an assessment of a pension plan on the premise that the plan continues on into the future indefinitely based on assumptions in respect of future events upon which a plan's benefits are contingent and methods that effectively determine the way in which a plan's costs will be allocated over the members' service. The true cost of a plan, however, will emerge only as experience develops, investment earnings are received, and benefit payments are made.

Margins for conservatism or provisions for adverse deviations have been built into the going concern discount rate assumption. This margin is aimed at reducing the potential adverse effect of the uncertainty inherent in the going concern assumptions. All other going concern assumptions and methods are considered to be best estimate.

This appendix summarizes the going concern assumptions and methods that have been used for the going concern valuation of the Plan at the valuation date. The going concern assumptions and methods have been chosen to reflect our understanding of the Plan's funding objectives with due respect to accepted actuarial practice and regulatory constraints. For purposes of this valuation, the going concern methods and assumptions were reviewed and changes as indicated were made.

Appendix C: Going Concern Assumptions and Methods

Assumptions and Methods

The actuarial assumptions and methods used in the current and previous valuations are summarized below and described on the following pages.

| | December 31, 2013 | December 31, 2012 |
|---|---|---|
| Economic Assumptions | | |
| Discount rate | 6.50% per annum, net of all expenses | 6.25% per annum, net of all expenses |
| Inflation rate | 2.25% per annum | 2.25% per annum |
| Increases in pensionable earnings | 1.50% at 1-Jan-2014, 3.00% per annum thereafter | 3.00% per annum |
| Increases in year's maximum pensionable earnings ("YMPE") | 3.00% per annum | 3.00% per annum |
| Increases in maximum pension limit | In accordance with <i>Income Tax Act</i> , then 3.00% per annum | In accordance with <i>Income Tax Act</i> , then 3.00% per annum |
| Interest on member contributions | 4.25% per annum | 4.25% per annum |
| Investment and non-investment expenses | Nil – discount rate has been reduced to reflect non-investment expenses and passively managed investment expenses. Additional expenses for active investment management are assumed to be offset by additional value add provided by such active management | Nil – discount rate has been reduced to reflect non-investment expenses and passively managed investment expenses. Additional expenses for active investment management are assumed to be offset by additional value add provided by such active management |
| Increase in pensions | Nil | Nil |
| Margin for adverse deviation | 0.25% per annum, taken into account in the discount rate assumption | 0.45% per annum, taken into account in the discount rate assumption |
| Demographic Assumptions | | |
| Mortality | CPM 2014 Private (unadjusted) with mortality improvements in accordance with CPM Improvement Scale B ¹ | 1994 Uninsured Pensioner Mortality Table projected generationally with scale AA ² |

¹ Pre-retirement mortality was applied

² Pre-retirement mortality was applied

Appendix C: Going Concern Assumptions and Methods

| | December 31, 2013 | December 31, 2012 |
|--------------------------------------|---|--|
| Retirement | 60% at earliest unreduced retirement age and remainder at normal retirement date | 60% at earliest unreduced retirement age and remainder at normal retirement date |
| Termination of employment | Variable by age (see below) | Same |
| Disability | Current service cost increased 0.25% of pensionable earnings to account for cost of the waiver of member contributions for disabled members | Same |
| Proportion married | | |
| Non-retired proportion with spouse | 85% and spouse assumed to be of opposite sex | Same |
| Non-retired spousal age differential | Males three years older | Same |
| Retired members | Actual marital status and ages are used, 5% of pensioners who were married at retirement assumed to be single at the valuation date | Same |
| Methods | | |
| Actuarial cost method | Projected accrued benefit | Same |
| Asset valuation method | Market value with actual nominal investment returns above / below the assumed discount rate smoothed over five years | Same |

Appendix C: Going Concern Assumptions and Methods

Description of Actuarial Assumptions and Methods

Economic Assumptions

Discount Rate

We have used a discount rate of 6.50% net of all expenses. This discount rate is equal to the best estimate long-term rate of investment return (net of all expenses) expected to be earned by the Plan's assets less a provision for adverse deviation equal to 0.25%.

The best estimate long-term net rate of investment return is 6.75% per annum which is based on:

- a best estimate inflation rate of 2.25% per annum;
- an expectation that active management will provide additional returns to offset investment management expenses that exceed the costs of a passively managed portfolio (for this plan, passively managed costs are estimated to be 0.03% per annum); and
- an expectation that non-investment expenses will reduce the long-term gross rate of investment return by 0.20% per annum.

This best-estimate rate of return was developed using best-estimate returns for each major asset class in which the pension fund is invested and then using a building block approach, based on the Plan's investment policy, to develop an overall best-estimate rate of return for the entire pension fund. Any additional gains from rebalancing and diversification have been included above.

The previous valuation's discount rate assumption was 6.25% per annum net of all expenses.

Inflation Rate

The inflation rate is assumed to be 2.25% per year. This reflects our best estimate of future inflation considering current economic and financial market conditions.

Increases in Pensionable Earnings

We have assumed future salary increases will be 1.50% at January 1, 2014 and 3.00% per annum thereafter. The assumption reflects an estimate of the short-term salary increase expectations based on input from the client and, after 2014, an assumed rate of inflation of 2.25% per year plus an allowance of 0.75% per year for the effect of productivity growth. In addition to the base rate, we assume rates of increase as a result of individual employee seniority, merit and promotion based on a scale which varies by age as shown in the following table.

Appendix C: Going Concern Assumptions and Methods

| Employee Seniority, Merit and Promotional Scale | |
|--|-----------------|
| Age | Annual Increase |
| Under 30 | 2.0% |
| 30 to 39 | 1.5% |
| 40 to 44 | 1.0% |
| 45 to 49 | 0.5% |
| 50+ | 0.0% |

The previous valuation's salary increase assumption was consistent with the post-2014 salary increase assumption for all periods.

Increases in Year's Maximum Pensionable Earnings

As the benefits paid to a member under the prior Metropolitan Authority Employees' Pension Plan are dependent on the future Year's Maximum Pensionable Earnings ("YMPE"), it is necessary to make an assumption regarding the future increases in the YMPE.

The YMPE was assumed to increase up until the time the member retires, dies or terminates from active employment at 3.0% per year. This is comprised of an annual increase of 2.25% on account of inflation, plus 0.75% on account of productivity, which is consistent with historical real economic growth.

This is unchanged from the previous valuation.

Increases in the Maximum Pension Limit

Pensions are limited to the maximum limits under the *Income Tax Act*. The maximum lifetime annual pension per year of pensionable service payable under the *Income Tax Act* is \$2,770.00 in 2014. It is assumed that the maximum limit will increase at 3.00% per year commencing in 2015. This is comprised of an annual increase of 2.25% on account of inflation, plus 0.75% on account of productivity, which is consistent with historical real economic growth. The rate of future increase in this limit is unchanged from the previous valuation.

Interest on Member Contributions

Interest is credited on member contributions with the rate credited by chartered banks on five-year personal fixed term deposits which we have assumed at a rate of 4.25% per year. The assumption reflects an assumed rate of future inflation plus 2.00% per year.

Expenses

Since the discount rate has been established net of all investment expenses, no explicit assumption is required for expenses.

Appendix C: Going Concern Assumptions and Methods

Economic Margins for Adverse Deviations

Margins for conservatism or provisions for adverse deviation have been built into the going concern assumptions where appropriate in order to reflect the uncertainty inherent in the assumptions made. Ideally, the level of margin should balance the need for:

- contribution rate stability;
- financial security for existing Plan members; and
- the avoidance of excessive contribution rate levels that potentially result in intergenerational inequity among members and unnecessary financial strain on the contributing employers.

Based on discussions with the Pension Committee regarding the preferred level of margins, the margin for adverse deviations deemed to provide such a balance at this time is a 0.25% reduction in the discount rate assumption.

Demographic Assumptions

Mortality

Benefits paid from the Plan in respect of a particular member are contingent to a very large degree on the survival of the member and/or the member's spouse. For example:

- If an active member dies prior to retirement, pre-retirement death benefits are triggered;
- A pension is paid to a pensioner only while the pensioner is alive;
- Where a member has elected a joint and survivor form of benefit, a pension is paid to the pensioner's spouse in the event the pensioner predeceases the spouse.

Consequently, an assumption regarding the survival of members and, where applicable, spouses to each age into the future have been made.

For this valuation, gender distinct mortality rates have been assumed to be in accordance with the 2014 Canadian Pensioner Mortality Table (Private Sector) – unadjusted with generational mortality improvements in accordance with CPM Improvement Scale B (CPM-B).

Generational mortality rates depend on the year of birth of a member and vary by age. For example, the mortality rate at age 80 for a member age 70 at the valuation date (e.g. 37.01 expected deaths per 1,000 lives for males in the table below) will be higher than the mortality rate at age 80 for a member age 60 (e.g. 30.40 expected deaths per 1,000 lives for males in the table below) at the valuation date. The mortality rates decline due to projected mortality improvements over time.

Mortality rates per 1,000 lives at selected ages are as follows:

Appendix C: Going Concern Assumptions and Methods

Mortality per 1,000 lives - Male

| Current age | Mortality per 1,000 lives at each future age | | | | |
|-------------|--|-------|--------|--------|--------|
| | 80 | 85 | 90 | 95 | 100 |
| 60 | 30.40 | 55.98 | 111.56 | 240.26 | 355.09 |
| 70 | 37.01 | 65.38 | 121.99 | 242.92 | 358.30 |
| 80 | 45.07 | 76.36 | 133.40 | 245.61 | 361.54 |
| 90 | n/a | n/a | 145.87 | 248.33 | 364.81 |

Mortality per 1,000 lives - Female

| Current age | Mortality per 1,000 lives at each future age | | | | |
|-------------|--|-------|--------|--------|--------|
| | 80 | 85 | 90 | 95 | 100 |
| 60 | 23.76 | 40.83 | 83.31 | 187.23 | 306.55 |
| 70 | 26.70 | 47.26 | 91.29 | 189.50 | 309.32 |
| 80 | 30.00 | 54.69 | 100.03 | 191.78 | 312.12 |
| 90 | n/a | n/a | 109.60 | 194.10 | 314.94 |

The previous valuation used the Uninsured Pensioner 1994 mortality table with generational mortality improvements using scale AA.

The mortality assumption is considered to be best estimate.

Retirement

A member's benefit entitlement under the Plan is dependent on when the member decides to commence, or is deemed to commence, to receive a pension from the Plan (referred to as "retirement from the Plan"). The terms of the Plan determine the pension that is payable to a member on retirement from the Plan and is dependent on whether the member retires, dies or terminates from active employment. Accordingly, an assumption with respect to when a member is expected to retire from the Plan has been made.

It has been assumed that 60% of active members will retire at the earliest unreduced retirement age. If the active member is eligible to retire immediately with an unreduced pension at the valuation date, then the active member is assumed to retire in the following year. The remainder is assumed to retire on their normal retirement date. The retirement assumption is unchanged from the previous valuation.

Termination

A member's benefit entitlement under the plan is impacted by whether the member terminates his/her employment prior to retirement for reasons other than death. In order to account for this impact in the calculation of the actuarial liability, an assumption regarding the probability that a member will terminate employment for reasons other than death has been made.

Appendix C: Going Concern Assumptions and Methods

The sample rates in the following table are believed to be representative of historical plan experience and are considered to be best estimate. This table was used in the previous valuation and has been retained for this valuation:

| Probability of Termination in the Year Following | |
|--|-------------|
| Age | Annual Rate |
| 25 | 20.0% |
| 30 | 11.2% |
| 35 | 6.3% |
| 40 | 3.4% |
| 45 | 1.8% |
| 50 | 1.2% |
| 55 | 0.7% |
| 60 | 0.2% |

Disability

If an active Plan member becomes disabled, credited service continues to accrue but generally employee contributions are waived. Since this benefit is substantially the same as the benefit that accrues to an active member, no disability assumption was used. However, the current service cost is increased by 0.25% of pensionable earnings to account for the cost of the waiver of member contributions for members who will become disabled in the year. This is unchanged from the previous valuation.

Proportion of Members with Spouses and Spousal Age Differential

The proportion of members who will have a spouse is based on broad population statistics. It is assumed that 85% of the non-retired plan members will have a spouse who is further assumed to be of the opposite sex. Furthermore, male partners are assumed to be three years older than female partners. Actual marital status at retirement was used for pensioners and 5% of pensioners who were married at retirement are assumed to be single at the valuation date. This is unchanged from the previous valuation.

Other

Actuarial Cost Method

An actuarial cost method is a technique used to allocate in a systematic and consistent manner the expected cost of a pension plan over the years of service during which plan members earn benefits under the Plan. By funding the cost of a pension plan in an orderly and rational manner, the security of benefits provided under the terms of the plan in respect of service that has already been rendered is significantly enhanced.

The projected accrued benefit actuarial cost method has been used for this valuation. Under this method, the actuarial present value of benefits in respect of service prior to the valuation date, but based on

Appendix C: Going Concern Assumptions and Methods

pensionable earnings projected to retirement, is compared with the actuarial asset value, revealing either a surplus or an unfunded actuarial liability.

With respect to service after the valuation date, the expected value of benefits for service in the year following the valuation date (i.e., the normal cost) net of any required employee contributions is expressed as a percentage of the expected value of participating payroll for that year. The employer normal cost contributions are determined each year by applying this percentage to the actual participating payroll for the year.

When calculating the actuarial present value of benefits at the valuation date, the present value of all retirement, withdrawal and pre-retirement death benefits are included. For each member, the retirement, withdrawal and pre-retirement death benefits for a particular period of service are first projected each year into the future taking into account future vesting, early retirement entitlements and minimum pension/value entitlements. These projected benefits for each future year are then capitalized, multiplied by the probability of the member leaving the Plan in that year and discounted with interest and survivorship to the valuation date. The actuarial present value of benefits for the particular period of service is then determined by summing the present values of these projected benefits.

The pattern of future contributions necessary to pre-fund future benefit accruals for any one particular individual will increase gradually as a percentage of their pensionable earnings as the individual approaches retirement. For a stable population (i.e., one where the demographics of the group remain constant from year to year), the normal cost will remain relatively level as a percentage of payroll.

In the event of future adverse experience, contributions in addition to the normal cost calculated under the projected accrued benefit actuarial cost method may be required to ensure that the Plan assets are adequate to provide the benefits. Conversely, favourable experience may generate surplus which may serve to reduce future contribution requirements.

Asset Valuation Method

The actuarial value of assets (AVA) methodology used described in Appendix A, was used to moderate fluctuations in contribution rates. The method used tracks market value, and will converge to the market value if rates of return matched assumptions. A five-year period of averaging was chosen which is within the typical range of an economic cycle. There is no bias in the method, as an equal probability of the AVA being higher or lower than the market value of assets is expected.

Appendix D: Solvency Assumptions and Methods

Valuation Assumptions

| | December 31, 2013 | December 31, 2012 |
|--|---|---|
| Economic Assumptions | | |
| Discount Rate | | |
| Transfer value basis | | |
| Active, disabled, inactive and deferred members not retirement eligible | 3.00% for 10 years; 4.60% thereafter | 2.40% for 10 years; 3.60% thereafter |
| Annuity purchase basis | | |
| Retirement eligible active, disabled, inactive and deferred members and all retired members, survivors and beneficiaries | 3.9% per annum | 3.00% per annum |
| Maximum pension limit increases | 2.26% for 10 years; 3.28% thereafter | 2.24% for 10 years, 3.30% thereafter |
| Demographic Assumptions | | |
| Mortality rates | 1994 Uninsured Pensioner Mortality Table with fully generational projection scale AA | Same |
| Withdrawal rates | Not Applicable | Same |
| Retirement age | | |
| Active and disabled members | Age that produces the highest lump-sum value | Same |
| Deferred vested members | Age that produces the highest lump-sum value | Same |
| Retired members and beneficiaries | Not applicable | Same |
| Termination of employment | 100% terminate on the valuation date with full vesting | Same |
| Marital status | | |
| Proportion of non-retired members with a spouse at retirement or pre-retirement death | 85% and spouse assumed to be of opposite sex | Same |
| Non-retired spousal / member age differential | Males partner three years older than female partner | Same |
| Retired members | Actual marital status at retirement with 5% of pensioners who had a spouse at retirement assumed to be single at the valuation date | Same |

Appendix D: Solvency Assumptions and Methods

| | December 31, 2013 | December 31, 2012 |
|---|--|---|
| Other | | |
| Wind up expenses | \$2,000,000 | No change |
| Actuarial cost method | Unit credit | No change |
| Asset valuation method | Smoothed value of assets | No change |
| Solvency Incremental Normal Cost | | |
| Increases in pensionable earnings | 1.50% at 1-Jan-2014, 3.00% per annum thereafter, plus increases due to seniority, merit, and promotion | 3.00% per annum plus increases due to seniority, merit, and promotion |
| Increases in YMPE | 3.00% per annum | No change |
| Increases in maximum pension limit | In accordance with <i>Income Tax Act</i> , then 3.00% | No change |
| Inflation Rate | 2.25% | No change |

Based on the Canadian Institute of Actuaries' Guidance and information such as pension legislation, Plan provisions and Plan experience, we have made the following assumptions regarding how the Plan's benefits would be settled on Plan wind up:

| | Percent of Liability Assumed to be Settled By Purchase of Annuities | Percent of Liability Assumed to be Settled By Lump-Sum Transfer |
|-----------------------------------|---|---|
| Active members | | |
| Not retirement eligible | 0% | 100% |
| Retirement eligible | 100% | 0% |
| Deferred vested members | | |
| Not retirement eligible | 100% | 0% |
| Retirement eligible | 100% | 0% |
| Retired members and beneficiaries | 100% | 0% |

Pensionable Earnings

To estimate active and disabled members' best average earnings, we have used actual historical member earnings.

Appendix D: Solvency Assumptions and Methods

Pre-retirement Mortality

We have made no allowance for pre-retirement mortality. The impact of including such an assumption would not have a material impact on the valuation, since the value of the death benefit is approximately equal to the value of the accrued pension.

Assumptions Not Needed

The following are not relevant to the solvency valuation:

- Increases in pensionable earnings;
- Termination of employment rates;
- Disability rates.

Estimated Wind Up Expenses

Plan wind up expenses would normally include such items as fees related to preparation of the actuarial wind up report, fees imposed by a pension supervisory authority, legal fees, administration, custodial and investment management expenses. We have assumed these fees would be \$2,000,000.

Calculation of Special Solvency Payments

We used a discount rate of 3.60% to calculate the special payments necessary to liquidate the solvency deficiency. This rate is a weighted average based on the relative proportions of benefit entitlements that are expected to be settled by purchase of annuities and lump-sum transfer.

Actuarial Cost Methods

Unit credit (accrued benefit) cost method as prescribed.

Asset Valuation Method Considerations

The actuarial value of assets (AVA) methodology is consistent with that used for going-concern purposes as described in Appendix A. The method used tracks market value, and will converge to the market value if rates of return matched assumptions. A five-year period of averaging was chosen which is within the typical range of an economic cycle. There is no bias in the method, as an equal probability of the AVA being higher or lower than the market value of assets is expected.

Incremental Cost on a Solvency Basis

The incremental cost on a solvency basis represents the present value, at the calculation date (time 0), of the expected aggregate change in the solvency liabilities between time 0 and the next calculation date (time t), adjusted upwards for expected benefit payments between time 0 and time t.

An educational note was published in December 2010 by the Canadian Institute of Actuaries' Committee on Pension Plan Financial Reporting to provide guidance for actuaries on the calculation of this new information.

The calculation methodology can be summarized as follows:

Appendix D: Solvency Assumptions and Methods

- The present value at time 0 of expected benefit payments between time 0 and time t, discounted to time 0,
plus
- A projected hypothetical wind up or solvency liabilities at time t, discounted to time 0, allowing for, if applicable to the pension plan being valued:
 - expected decrements and related changes in membership status between time 0 and time t,
 - accrual of service to time t,
 - expected changes in benefits to time t,
 - a projection of pensionable earnings to time t,minus
- The hypothetical wind up or solvency liabilities at time 0.

The projection calculations take into account the following assumptions and additional considerations:

- The assumptions for the expected benefit payments and decrement probabilities, service accruals, and projected changes in benefits and/or pensionable earnings would be consistent with the assumptions used in the pension plan's going concern valuation.
- The assumptions used to calculate the projected liability at time t are consistent with the assumptions for the solvency liabilities at time 0, assuming that interest rates remain at the levels applicable at time 0, that the select period is reset at time t for interest rate assumptions that are select and ultimate and that the Standards of Practice for the calculation of commuted values and the guidance for estimated annuity purchase costs in effect at time 0 remain in effect at time t.
 - Active and inactive plan members as of time 0 are considered in calculating the incremental cost.

Appendix E: Summary of Current Plan Provisions

This funding valuation was based on plan design information provided by HRM as of December 31, 2013. The following is a summary of the main provisions of the Plan. Reference should be made to the official Plan documents for purposes of actual benefit determination and contribution requirements.

| | |
|---|---|
| Effective Date (as a result of a merger of four pension plans "Prior Plans") | April 1, 1998 (amended and restated as at June 16, 2011 and as further amended by Amendment 2011-01 dated November 24, 2011). |
| Jurisdiction of Registration | Nova Scotia |
| Prior Plans | <p><i>City of Halifax Superannuation Plan;</i> <i>Halifax County Municipality Full-time Retirement Pension Plan;</i> <i>City of Dartmouth Employees' Retirement Plan;</i> and <i>Metropolitan Authority Employees' Pension Plan</i></p> <p>Active and LTD members as April 1, 1998 were provided the option to accrue service under the Halifax Regional Municipality Pension Plan (the Current Plan), as well as the option to convert their service in the Prior Plan to the Current Plan.</p> <p>Out of 5,645 active members in the Plan as at December 31, 2013, the number of active members still accruing service in the Prior Plans are as follows:</p> <ul style="list-style-type: none">• 8 members in the <i>City of Halifax Superannuation Plan</i>;• 5 members in the <i>Halifax County Municipality Full-time Retirement Pension Plan</i>;• 11 members in the <i>City of Dartmouth Employees' Retirement Pension Plan</i>; and• 0 members in the <i>Metropolitan Authority Employees' Pension Plan</i> |
| Eligibility for Membership | |
| Full-time employees | Full-time employees are eligible to join the Plan on the date of full-time employment with a participating municipality/employer. |

Appendix E: Summary of Current Plan Provisions

| | |
|---|--|
| Part-time employees | Part-time employees may join the Plan on the first day of January or July coincident with or next following the completion of 12 months of continuous service, provided they have attained at least one of the following in the preceding 12 months: <ul style="list-style-type: none">• Earnings of at least 25% of the YMPE from employment with the municipality/participating employer; or• 700 hours of employment with the municipality/participating employer. |
| Contributions – Defined Benefit | Members and the municipality/participating employer contribute in equal proportions in the amount required to pay the cost of providing benefits under the Plan's defined benefit provision to which members are entitled to as determined by the actuary. |
| Contributions – Defined Contribution | Members who elect to contribute to the Plan's defined contribution provision contribute on their defined contribution earnings based on the contribution rates defined in the Plan. |
| Earnings – Defined Benefit | Basic regular hourly wages or annual salary, including shift and sewer bonuses, and like amounts received on a regular basis, but excluding overtime pay, cash in lieu of vacation, performance bonuses, clothing allowances or other amounts not part of a member's basic remuneration. |
| Earnings – Defined Contribution | Overtime and other non-regular earnings as defined in the Plan. |
| Normal Retirement | |
| Eligibility | First of the month coincident with or first following attainment of age 65 (age 60 for employees in Public Safety Occupations). |
| Benefit | Annual pension payable in equal monthly instalments calculated as credited service multiplied by 2.0% of average annual earnings over the 3 highest consecutive calendar years of continuous service while a member of the Plan. In addition, member receives the value of the defined contribution account. |

Appendix E: Summary of Current Plan Provisions

Early Retirement

From active service

Eligibility

As early as 10 years prior to normal retirement date or on or after the Optional Retirement Date.

A member can retire and receive an unreduced pension on his Optional Retirement Date. Optional Retirement Date is first day of the month coincident with or next following the earlier of:

- The date on which the member's age plus continuous service equals 80 (75 for employees in Public Safety Occupations hired on or after July 1, 1994 who were members of the former Halifax Plan, employees in Public Safety Occupations who became members after April 1, 1998, or other members in Public Safety Occupations who have elected to convert to the Current Plan and have elected to enhance their unreduced early retirement provision to the Rule of 75); and
- The date on which the member attains age 60.

Benefit

Normal retirement defined benefit accrued to early retirement date, reduced by 0.5% for each month that the early retirement date precedes the date the member would have been eligible for an unreduced pension assuming continued employment. In addition, member receives the value of the defined contribution account.

From deferred vested

Eligibility

First of month following later of attainment of age 55 (age 50 for members in Public Safety Occupations).

Benefit

Accrued defined benefit earned to date. The accrued benefit is reduced 6% per year the pension commencement date precedes the member's age 60 if termination is December 31, 2010, and is otherwise payable commencing on the normal retirement date if termination is on or after December 31, 2010. In addition, member receives the value of the defined contribution account.

Postponed Retirement

Eligibility

Any time after normal retirement date and before December 31 of the year in which the member attains age 71.

Benefit

Normal retirement defined benefit accrued to postponed retirement date. In addition, member receives the value of the defined contribution account.

Appendix E: Summary of Current Plan Provisions

Termination of Employment

Less than 2 years of plan membership:

Benefit:

Refund of the member's contributions with interest including the member's contributions under the defined contribution provision of the plan.

At least 2 years of plan membership:

Benefit

Accrued defined benefit earned to date. The accrued defined benefit is reduced 6% for each year that the pension commencement date precedes the member's age 60 if termination is before December 31, 2010, and is otherwise payable commencing on the normal retirement date if termination is on or after December 31, 2010.

Deferred pensions can commence as early as first of month following later of attainment of age 55 (age 50 for members in Public Safety Occupations).

In lieu of the monthly pension, the member may elect to transfer the lump-sum value of the deferred pension to an acceptable registered retirement vehicle in accordance with applicable federal and provincial legislation.

Member is also entitled to a transfer of their total account under the defined contribution provision of the plan.

Preretirement Death

Before entitled to an immediate pension

Benefit

Lump sum equal to the amount the member would have received had employment terminated on the date of death.

Appendix E: Summary of Current Plan Provisions

After entitled to an immediate pension

Benefit

Spouse or common law partner is entitled the greater of:

- Immediate pension calculated as if the member had retired on the day before death and elected to receive his/her pension in the form of a joint and 66 2/3% survivor pension.
- Commuted value of the defined benefit assuming the deceased member had terminated.

If there is no spouse or common law partner, the beneficiary will receive a lump sum equal to the amount the member would have received had employment terminated.

The spouse, common law partner, or beneficiary is also entitled to a transfer of the member's total account under the defined contribution provision of the plan.

Disability

Eligibility

Qualification for benefits under municipality/participating employer sponsored long-term disability plan.

Benefit

Credited service continues to accrue. Member required contributions cease.

Maximum Benefit

The annual retirement benefit under the defined benefit provisions must not exceed the lesser of (1) and (2) below:

(1) The defined benefit limit under the Income Tax Act (or two-thirds of such limit in the case of service purchased after June 7, 1990 that was not previously pensionable service under a registered pension plan prior to 1990) at the time of pension commencement multiplied by years of credited service; and

(2) 2% of the average of the highest indexed compensation of the member for the best three consecutive years' earnings multiplied by credited service.

Appendix E: Summary of Current Plan Provisions

Minimum Employer Cost

On retirement, death, or termination, the required member contributions (excluding contributions made to purchase service) with interest cannot provide more than 50% of the commuted value of the benefit (excluding the portion of the benefit relating to purchased service).

In the event the required member contributions with interest provide more than 50% of the benefit, the excess will be refunded to the member or beneficiary.

Normal Form of Payment

Member without spouse at retirement

Life annuity with a guarantee that at least 120 monthly payments will be made.

Member with spouse at retirement

Joint and 66 2/3% survivor annuity with a guarantee that in total an amount of at least the member's contributions plus interest at the time of retirement will be paid.

Increases to Pensions in Payment

Increases to pensions in pay may be increased from time to time as provided by the HRM Pension Committee. Such increases are subject to the aggregate percentage increase in any member's pension not exceeding the lesser of 6% per year and the aggregate percentage increase in the Consumer Price Index from the member's retirement date.



Appendix F: Administrator Certification

Certification of Plan Administrator

With respect to the Halifax Regional Municipality Pension Plan, forming part of the actuarial report as at December 31, 2013, I hereby certify that, to the best of my knowledge and belief the actuary has been:

- provided copies of all official plan documents, financial statements and amendments up to December 31, 2013; and
- notified of all events occurring subsequent to the valuation date that could have an impact on the results of the valuation.

ORIGINAL SIGNED

Name (print):

Title:

Signature:

Date:

Certification of Third Party Administrator

With respect to the Halifax Regional Municipality Pension Plan, forming part of the actuarial report as at December 31, 2013, I hereby certify that, to the best of my knowledge and belief that the membership data provided to the actuary and as summarized in Appendix B is a complete and accurate description of all persons who are entitled to benefits under the terms of the plan in respect of service up to the valuation date.

ORIGINAL SIGNED

Name (print):

Title:

Signature:

Date: