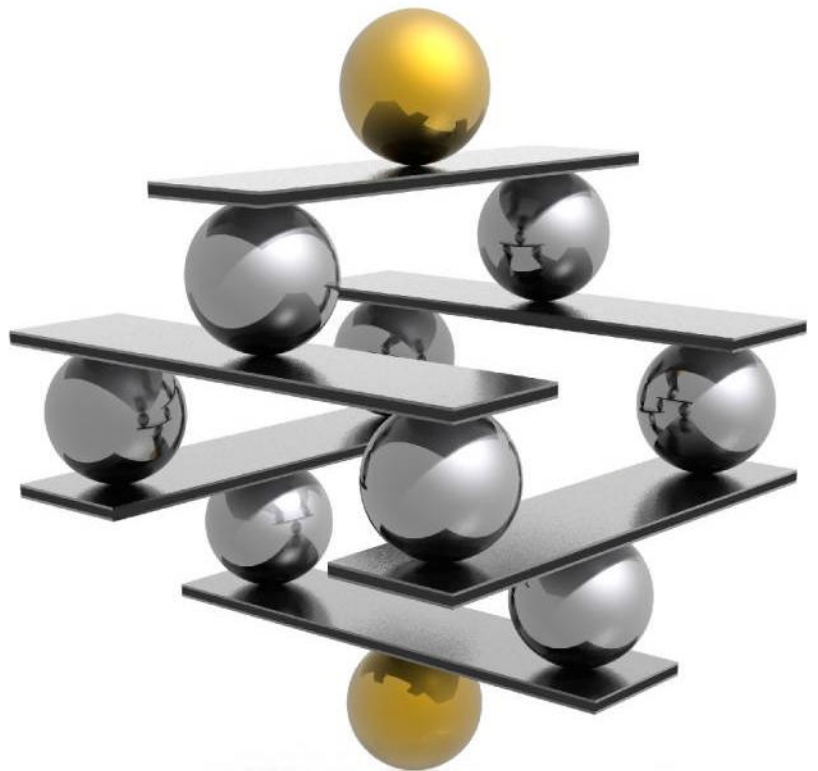


# Actuarial Valuation as at December 31, 2012

*Halifax Regional Municipality Pension Plan*

Registration Number: 238063

*August 21, 2013*



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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, 2012 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, 2013 as prescribed by the Nova Scotia *Pension Benefits Act*.

### Summary of Principal Results

	December 31, 2012		December 31, 2009	
	Going Concern	Solvency	Going Concern	Solvency
Assets	\$1,209,583,000	\$1,295,309,000	\$1,115,263,000	\$1,138,902,000
Liabilities	<u>1,423,518,000</u>	<u>1,994,919,000</u>	<u>\$1,175,354,000</u>	<u>1,377,191,000</u>
<b>Surplus/(Deficit)</b>	<b>\$ (213,935,000)</b>	<b>\$ (699,610,000)</b>	<b>\$ (60,091,000)</b>	<b>\$ (238,289,000)</b>
Funded / Transfer Ratio	85.0%	60.5%	94.9%	80.9%

### Contribution Requirements

The overall contribution rate recommended in this report with effect from January 1, 2014 is presented in the following table. For 2013, the contribution rates in effect for 2012 should continue.

	Contribution Rates Effective 1-Jan-2014
Current service cost	17.3%
Amortization from December 31, 2009 valuation	1.8%
Amortization from December 31, 2012 valuation	<u>4.8%</u>
<b>Total</b>	<b>23.9%</b>

## Executive Summary

### Key Assumptions

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

	December 31, 2012		December 31, 2009	
	Going Concern	Solvency	Going Concern	Solvency
<b>Discount rate</b>	6.25%	Annuity purchases: 3.0% Transfers: 2.4% for 10 years, 3.6% thereafter	6.75%	Annuity purchases: 4.49% Transfers: 3.9% for 10 years, 5.4% thereafter
<b>Inflation rate</b>	2.25%	n/a	2.25%	n/a
<b>Pensionable earnings</b>	3.00%	n/a	3.00%	n/a
<b>Mortality table</b>	UP94 Generational	UP94 Generational	UP94 Generational	UP94 projected to 2020
<b>Retirement rates</b>	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, 2012 for the general purpose of determining the minimum and maximum 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, 2012;
- § 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, 2012;
- § Determine the funding requirements of the Plan as at December 31, 2012 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, 2013 as prescribed by the PBA.

### Summary of Changes Since the Last Valuation

The last such actuarial valuation in respect of the Plan was performed as at December 31, 2009. Since the time of the last valuation the following changes have transpired:

- The Plan was amended by Amendments 2010-01 and 2011-01. These amendments did not impact the Plan's financial position.
- On December 21, 2012, amendments to the PBA regulations were passed which impacts the minimum prescribed funding requirements for the Plan as at December 31, 2012. Specifically, these amendments provide for the following:
  - ∅ the legislated requirement to fund solvency deficiencies no longer applies to the Plan;
  - ∅ any contribution rate increases revealed by a valuation may be delayed for up to 12 months from the valuation date; however, our understanding is that any such delay must be factored into the contribution rate increases and, specifically, a delay cannot serve to extend the amortization period for any going-concern related deficits beyond 15 years from the valuation date;

## Section 1: Introduction

- Ø while solvency deficiencies for the Plan are no longer required to be funded, if the Plan's ratio of solvency assets to solvency liabilities is below 0.85, the Plan will need to file annual valuations; and
- Ø the valuation report must continue to disclose information relating to solvency.

## Information and Inputs

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

- § A copy of the previous valuation report as at December 31, 2009;
- § Membership data compiled as at December 31, 2012;
- § 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 2011-01.

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.

## Subsequent Events

On March 21, 2013, HRM revised and approved the Plan's funding policy and in so doing emphasized that the Plan's primary focus should be on going-concern funding given the fact that the PBA no longer requires the funding of solvency deficits. These changes to the funding policy have been reflected in the funding recommendation contained in this report.

Apart from the change to the funding policy, 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, 2012 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 1: Introduction

- § The Canadian Institute of Actuaries (CIA) is currently conducting a study of Canadian mortality levels and trends. While the study is not yet complete, the researchers have communicated that the study's preliminary results are suggesting that:
- Ø the widely used 1994 Uninsured Pensioner (UP94) mortality table together with generational improvements as per Scale AA overstates Canadian experience; and
  - Ø more rapid improvements in mortality have been observed than suggested by the widely used AA improvement scale.

As at the date of this report, the CIA has released a draft report on its research. The initial findings contained in this report suggest that the Plan's liabilities may increase by a material amount at the next valuation. However, before reaching conclusions on how this latest information may influence the Plan's mortality assumption, the research needs to be completed and the Plan's experience reviewed in relation to the final findings.

## 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, 2012 is shown in the following table. The results as at December 31, 2009 are also shown for comparison purposes.

#### Going Concern Financial Position

	December 31, 2012	December 31, 2009
<b>Assets</b>		
Market value of assets	\$ 1,211,130,000	\$ 1,013,441,000
Actuarial asset smoothing amount	<u>(1,547,000)</u>	<u>101,822,000</u>
<b>Total value of assets</b>	<b>\$ 1,209,583,000</b>	<b>\$ 1,115,263,000</b>
<b>Actuarial liabilities</b>		
Active and disabled members	\$ 717,905,000	\$ 615,574,000
Inactive members and deferred pensioners	15,920,000	17,204,000
Pensioners and survivors	665,175,000	525,576,000
Defined contribution accounts	22,363,000	17,000,000
Transfer deficiency holdbacks <sup>1</sup>	<u>2,155,000</u>	<u></u>
<b>Total actuarial liabilities</b>	<b>\$ 1,423,518,000</b>	<b>\$ 1,175,354,000</b>
<b>Surplus / (unfunded liability)</b>	<b>\$ <u>(213,935,000)</u></b>	<b>\$ <u>(60,091,000)</u></b>
<b>Going-concern funded ratio</b>	<b>85.0%</b>	<b>94.9%</b>

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



## Section 2: Going Concern Valuation Results

### Change in Financial Position

During the period from December 31, 2009 to December 31, 2012, the going concern financial position of the Plan changed from an unfunded liability of \$60,091,000 to an unfunded liability of \$213,935,000. 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, 2009 to December 31, 2012

<b>Surplus/(Unfunded Liability) as at December 31, 2009</b>	\$ (60,091,000)
Expected interest on surplus (unfunded liability)	(13,008,000)
Total special payments made in inter-valuation period with interest	<u>44,300,000</u>
<b>Expected Surplus/(Unfunded Liability) as at December 31, 2012</b>	<b>\$ (28,799,000)</b>
Change in liabilities due to experience gains/(losses)	
Gain/(loss) from investment earnings greater/lower than expected	(140,336,000)
Gain/(loss) due to retirement experience	7,789,000
Gain/(loss) due to salary increases lower/greater than expected	1,423,000
Gain/(loss) due to active decrement experience other than retirement	23,368,000
Gain/(loss) due to pensioner mortality experience	(3,858,000)
Net gain/(loss) due to other experience and miscellaneous items	<u>9,505,000</u>
<b>Surplus/(Unfunded Liability) after experience gains/(losses) as at December 31, 2012</b>	<b>\$ (130,908,000)</b>
Change in liabilities due to change in assumptions	(83,027,000)
Change in liabilities due to plan amendments	<u>0</u>
<b>Surplus/(Unfunded Liability) as at December 31, 2012</b>	<b>\$ (213,935,000)</b>

## Section 2: Going Concern Valuation Results

### 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.

	<b>Valuation Basis December 31, 2012</b>	<b>Based on Rate of 1% Lower</b>	<b>Effect</b>	
			<b>Net change</b>	<b>% change</b>
<b>Going concern liabilities</b>	\$ 1,423,518,000	\$ 1,619,426,000	\$ 195,908,000	13.8%
<b>Normal cost as % of total pensionable earnings</b>	17.3%	20.8%	3.5%	20.2%

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, 2012 is shown in the following table. The solvency financial position of the Plan as at December 31, 2009 is shown for comparison purposes.

#### Solvency Financial Position

	December 31, 2012	December 31, 2009
<b>Assets</b>		
Market value of assets	\$ 1,211,130,000	\$ 1,013,441,000
Actuarial asset smoothing amount	(1,547,000)	101,822,000
Present value of special payments for next five years	87,726,000	24,639,000
Estimated wind up expenses	<u>(2,000,000)</u>	<u>(1,000,000)</u>
<b>Total Assets</b>	<b>\$ 1,295,309,000</b>	<b>\$ 1,138,902,000</b>
<b>Solvency Liabilities</b>		
Active and disabled members	\$ 1,034,581,000	\$ 693,160,000
Inactive members and deferred pensioners	28,241,000	24,499,000
Pensioners and survivors	907,579,000	642,532,000
Defined contribution accounts	22,363,000	17,000,000
Transfer deficiency holdbacks <sup>1</sup>	<u>2,155,000</u>	<u>n/a</u>
<b>Total Liabilities</b>	<b>\$ 1,994,919,000</b>	<b>\$ 1,377,191,000</b>
<b>Solvency Surplus/(Deficiency)</b>	<b>\$ (699,610,000)</b>	<b>\$ (238,289,000)</b>
<b>Transfer Ratio</b>	<b>60.5%</b>	<b>80.9%</b>

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

## 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)	1,207,583,000
Solvency liabilities	1,994,919,000
Ratio	60.5%

Since the ratio of the solvency assets to the solvency liabilities is less than 1.0 as at December 31, 2012 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, 2012	Based on Rate of 1% Lower	Effect	
			\$	%
Solvency liabilities	\$ 1,994,919,000	\$ 2,340,446,000	\$ 345,527,000	17.3%

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, 2012 of the expected aggregate change in the solvency liabilities between December 31, 2012 and the next calculation date, December 31, 2013. 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, 2012 to December 31, 2013 is \$112,890,000.

## 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 2013 is estimated to be \$51,414,000. When applied to the estimated 2013 pensionable earnings on which contributions are expected to be made of \$297,191,000<sup>1</sup>, the resulting normal cost contribution rate is 17.3%.

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 16.1%. An analysis of the change in total normal cost is as follows:

Total normal cost as at December 31, 2009	16.1%
Demographic changes	(0.3%)
Change in discount rate assumption	<u>1.5%</u>
Total normal cost as at December 31, 2012	17.3%

<sup>1</sup> The pensionable earnings base on which contributions are expected to be made has been determined as the total pensionable earnings at the valuation date of \$303,022,000 less estimated deemed earnings in respect of those for whom contributions are waived of \$5,831,000.

## 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, 2012 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, 2012 will need to be amortized by special payments established from two amortization schedules as follows:

- continuation of the established going-concern deficit contribution schedule established at December 31, 2009 where such established schedule expires December 31, 2024; and
- a new going-concern deficit contribution schedule commencing January 1, 2014 and ending December 31, 2027.

The contribution rate attributed to the established deficit contribution schedule is 1.8% of pensionable earnings.

The contribution rate attributed to the new schedule is determined such that the December 31, 2012 going-concern deficit is fully amortized by December 31, 2027 taking into account the Plan's established 2013 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, 2014 through December 31, 2027 equals the December 31, 2012 going-concern deficit less:

- The present value of 1.8% of pensionable earnings from January 1, 2013 through December 31, 2024. This amount represents the present value of the continuation of the going-concern deficit contributions that were established at December 31, 2009; and
- The present value of 2013 contributions that will exceed the 2013 normal cost (i.e. 17.3% of pensionable earnings) and the 2013 established going-concern deficit payment of 1.8% of pensionable earnings.

The following table summarizes the development of the going-concern deficit contributions as described above. As alluded to previously, these contributions align with the minimum requirements under the PBA after taking into account the Plan's already established 2013 contribution rate of 20.7% of pensionable earnings.

## Section 4: Contribution Requirements

Date Deficit Contribution Schedule Established	Date Deficit Contribution Schedule Begins	Date Deficit Contribution Schedule Ends	Deficit Contribution as % of Total Pensionable Earnings	Present Value at 31-Dec-2012 of Post-2012 Scheduled Deficit Contributions <sup>1</sup>
31-Dec-2012	01-Jan-2014	31-Dec-2027	4.8% <sup>2</sup>	\$ 156,524,000
31-Dec-2009	01-Jan-2010	31-Dec-2024	1.8%	52,798,000
N/A	01-Jan-2013	31-Dec-2013	1.6%	<u>4,613,000</u>
Total				\$ 213,935,000

### 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, 2014

In accordance with the Plan's provisions, when contribution rate increases are necessary, municipality/participating employers' and the members' contributions are to increase equally so that contributions are sufficient.

Based on this provision, the contribution rate increase that is applicable to various groups was determined as follows:

- the total contribution rate increase was first determined;
- one-half of the total increase was then added to each of the members' and employers' current contribution rate schedule; and
- the member and employer contribution rates relating to the Dartmouth Plan Division were then adjusted such that the ratio between member and employer remains at 1:1.1.

<sup>1</sup> The values in the table were developed using the going concern discount rate assumption of 6.25% per annum.

<sup>2</sup> This value has been determined assuming an aggregate pensionable earnings base of \$297,191,000 at January 1, 2013 (total pensionable earnings of \$303,022,000 less estimated deemed earnings in respect of those for whom contributions are waived of \$5,831,000) increasing each January 1 by the assumed general salary increase of 3.0% per annum and based on the resulting deficit contributions being remitted monthly in arrears.

## Section 4: Contribution Requirements

The following table summarizes the contribution rate schedules by division that are necessary to meet the aggregate normal cost and going-concern deficit funding requirements presented earlier.

	Current rates ending December 31, 2013		Rates effective January 1, 2014	
	Members	Employers	Members	Employers
<b>Current Plan Division</b>				
Public Safety Occupations hired after 1-Apr-1998	10.71%	10.71%	12.31%	12.31%
Public Safety Occupations hired after 1-Jul-1994 under the former Halifax Plan	10.71%	10.71%	12.31%	12.31%
Other Public Safety Occupations who elected the "Rule of 75"	11.06%	10.36%	12.66%	11.96%
Other members	10.36%	10.36%	11.96%	11.96%
<b>Dartmouth Plan Division</b>				
Public Safety Occupations	9.96%	10.96%	11.49%	12.63%
Members contributing at a lower rate	8.66%	9.53%	10.19%	11.20%
Other members	9.66%	10.63%	11.19%	12.30%
<b>Halifax Plan Division</b>				
Public Safety Occupations hired after 1-Jul-1994	10.41%	10.41%	12.01%	12.01%
Other members	10.06%	10.06%	11.66%	11.66%
<b>County Plan Division</b>				
All members	9.86%	9.86%	11.46%	11.46%
<b>Metro Plan Division</b>				
All members	10.16% to YMPE, 11.06% above	10.16% to YMPE, 11.06% above	11.76% to YMPE, 12.66% above	11.76% to YMPE, 12.66% above

It is important to note that the increased member contribution rates will require Canada Revenue Agency (CRA) approval as they exceed the maximum prescribed amounts under the Income Tax Act. Based on guidance published by CRA, we expect such increases will be accepted.

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 17.3%; 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, 2012. I confirm that I have prepared an actuarial valuation of the Plan as at December 31, 2012 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:

	<b>Contribution Rates Effective 1-Jan-2013</b>	<b>Contribution Rates Effective 1-Jan-2014</b>
Current service cost	17.3%	17.3%
Amortization from December 31, 2009 valuation	1.8%	1.8%
Amortization from December 31, 2012 valuation	<u>1.6%</u>	<u>4.8%</u>
<b>Total</b>	<b>20.7%</b>	<b>23.9%</b>

§ 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, 2013 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, 2012:

- The Plan has a going concern unfunded liability of \$213,935,000, based on going concern assets of \$1,209,583,000 less going concern liabilities of \$1,423,518,000.
- 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, 2012 as prescribed by the PBA:

- The Plan has a solvency deficiency of \$699,610,000, determined as solvency assets, net of wind up expenses, of \$1,295,309,000 which includes the present value of the next five years of unfunded liability payments of \$87,726,000, less solvency liabilities of \$1,994,919,000.
- 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 60.5%

§ 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 17.3% of pensionable earnings. This amount is estimated to equal \$51,414,000 in 2013 and \$52,956,000 in 2014.
- The special payments or deficit contributions required to amortize the going-concern unfunded liability at December 31, 2012 that meet the minimum PBA requirements after taking into account the Plan's already established 2013 contribution rate of 20.7% of pensionable earnings is as follows:

<b>Date Deficit Contribution Schedule Established</b>	<b>Date Deficit Contribution Schedule Begins</b>	<b>Date Deficit Contribution Schedule Ends</b>	<b>Deficit Contribution as % of Total Pensionable Earnings</b>
31-Dec-2012	01-Jan-2014	31-Dec-2027	4.8%
31-Dec-2009	01-Jan-2009	31-Dec-2024	1.8%
N/A	01-Jan-2013	31-Dec-2013	1.6%
Total			

- The aggregate deficit contributions for 2013 and 2014 are estimated to be \$10,104,000 and \$20,203,000 respectively.
- If the aggregate contribution rates recommended above (i.e. 20.7% for 2013 and 23.9% beginning January 1, 2014) are allocated as prescribed by the terms of the Plan between members and participating employers in accordance with the following table, the resulting funding is expected to be sufficient to satisfy the minimum funding requirements of the PBA.

## Section 5: Actuarial Certificate

	Current rates ending December 31, 2013		Rates effective January 1, 2014	
	Members	Employers	Members	Employers
<b>Current Plan Division</b>				
Public Safety Occupations hired after 1-Apr-1998	10.71%	10.71%	12.31%	12.31%
Public Safety Occupations hired after 1-Jul-1994 under the former Halifax Plan	10.71%	10.71%	12.31%	12.31%
Other Public Safety Occupations who elected the "Rule of 75"	11.06%	10.36%	12.66%	11.96%
Other members	10.36%	10.36%	11.96%	11.96%
<b>Dartmouth Plan Division</b>				
Public Safety Occupations	9.96%	10.96%	11.49%	12.63%
Members contributing at a lower rate	8.66%	9.53%	10.19%	11.20%
Other members	9.66%	10.63%	11.19%	12.30%
<b>Halifax Plan Division</b>				
Public Safety Occupations hired after 1-Jul-1994	10.41%	10.41%	12.01%	12.01%
Other members	10.06%	10.06%	11.66%	11.66%
<b>County Plan Division</b>				
All members	9.86%	9.86%	11.46%	11.46%
<b>Metro Plan Division</b>				
All members	10.16% to YMPE, 11.06% above	10.16% to YMPE, 11.06% above	11.76% to YMPE, 12.66% above	11.76% to YMPE, 12.66% above

- 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*.

## Section 5: Actuarial Certificate

§ Notwithstanding the above certifications, emerging experience differing from the assumptions will result in gains or losses that will be revealed in subsequent valuations.

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

August 21, 2013

## 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 2010, 2011, and 2012 prepared by KPMG 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, 2012 as reported by Halifax Regional Municipality Annual Report.

	December 31, 2012	
	\$	%
Cash and equivalents	\$ 7,267,000	0.6%
Fixed-income	528,053,000	43.6%
Canadian equities	201,048,000	16.6%
Global equities	245,859,000	20.3%
Minimum Targeted Return	228,903,000	18.9%
<b>Total Invested Assets</b>	<b>\$ 1,211,130,000</b>	<b>100.0%</b>

## 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%
		<b>100%</b>	

### Reconciliation of Changes in Market Value of Assets

The table below reconciles changes in the market value of assets between December 31, 2009 and December 31, 2012.

	2010	2011	2012
<b>Beginning of Plan Year</b>	<b>\$ 1,013,155,000</b>	<b>\$ 1,108,996,000</b>	<b>\$ 1,118,582,000</b>
Contributions during plan year			
Employees	29,294,000	31,082,000	30,710,000
Participating employers	29,769,000	31,163,000	32,129,000
Transfers from other pension plans	<u>711,000</u>	<u>133,000</u>	<u>314,000</u>
Total	59,774,000	62,378,000	63,153,000
Benefit Payments During Plan Year			
Refunds and transfers to other pension plans	(10,291,000)	(8,084,000)	(7,499,000)
Pension benefits paid	<u>(51,226,000)</u>	<u>(54,416,000)</u>	<u>(59,767,000)</u>
Total	(61,517,000)	(62,500,000)	(67,266,000)
Administrative expenses	(7,002,000)	(7,341,000)	(6,182,000)
Investment income	104,586,000	17,049,000	102,843,000
<b>End of Plan Year</b>	<b>\$ 1,108,996,000</b>	<b>\$ 1,118,582,000</b>	<b>\$ 1,211,130,000</b>

## 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, 2012.

The development of the actuarial value of assets as of December 31, 2012 is shown below:

<b>Development of the Actuarial Value of Assets</b>			
Market value of assets at December 31, 2012		\$	1,211,130,000
Less: Unrecognized investment return excess/(deficiency) as compared to 6.75% discount rate assumption for 2009 to 2012	2012:	\$21,295,438 x 80% =	17,036,000
	2011:	(\$65,145,518) x 60% =	(39,087,000)
	2010:	\$29,178,126 x 40% =	11,671,000
	2009:	\$59,634,345 x 20% =	<u>11,927,000</u>
			1,547,000
Actuarial value of assets at December 31, 2012		\$	1,209,583,000

## 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, 2012. 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 and 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;
- § A reconciliation of birth, hire, and participation dates against the corresponding dates provided for the last valuation to ensure consistency of data;
- § A reconciliation of credited service against the corresponding amount provided for the last valuation to ensure that no member accrued more than three years of credited service from December 31, 2009;
- § A reconciliation of pensionable earnings against the corresponding amounts provided for the last valuation to identify any unusual increases or decreases;
- § A reconciliation of accrued benefits against the corresponding amounts provided for the last valuation to identify any unusual benefit accruals;
- § A reconciliation of inactive member benefit amounts against the corresponding amounts provided for the last valuation to ensure consistency of data.

The following information was missing, and assumptions were made as follows with respect to such missing data:

- § Two participating employers did not submit their data for the December 31, 2012 year-end. We assumed the membership demographics, but with appropriate salary increase adjustments, were the same as the December 31, 2009 valuation.



## Appendix B: Membership Data

### Membership Reconciliation

The table below reconciles the number of members as of December 31, 2012 with the number of members as of December 31, 2009, and the changes due to experience in the period.

	Active	Inactive and Deferreds	Pensioners/ Survivors	Total
<b>Number at December 31, 2009</b>	<b>5,592</b>	<b>561</b>	<b>2,891</b>	<b>9,044</b>
New entrants	921	10	19	950
Reactivated	51	(51)	-	-
To inactive / deferred	(126)	127	(1)	-
Retirements	(468)	(44)	512	-
Terminations / deaths	(343)	(168)	(133)	(644)
<b>Members, December 31, 2012</b>	<b>5,627</b>	<b>435</b>	<b>3,288</b>	<b>9,350</b>

### Membership Summary

#### Active Members

	December 31, 2012	December 31, 2009
Number	5,627	5,592
Average pensionable earnings rate	\$ 53,851 <sup>1</sup>	\$ 49,251
Average age	46.8 years	46.2 years
Average years of pensionable service	11.2 years	11.2 years
Proportion female	46.7%	45.7%
Accumulated member contributions	\$ 284,992,873	\$ 254,395,583

<sup>1</sup> 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.



## Appendix B: Membership Data

### Inactive and Deferred Vested Members

	December 31, 2012	December 31, 2009
Number	435	561
Average age	49.4 years	46.6 years
Average annual pension <sup>1</sup>	\$ 5,146	\$ 5,501
Proportion female	56.6%	63.3%

### Pensioner and Survivor Members

	December 31, 2012	December 31, 2009
Number	3,288	2,891
Average age	70.2 years	69.3 years
Average annual pension	\$ 18,437	\$ 17,126
Proportion female	46.5%	46.1%

<sup>1</sup> 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
<b>&lt; 25</b>	Count	42							42
	Average earnings	\$41,677							\$41,677
<b>25–29</b>	Count	178	36						214
	Average earnings	\$47,550	\$68,779						\$51,121
<b>30–34</b>	Count	255	163	32					450
	Average earnings	\$51,624	\$65,833	\$73,792					\$58,347
<b>35–39</b>	Count	244	201	128	17				590
	Average earnings	\$47,703	\$61,857	\$65,965	\$67,994				\$57,071
<b>40–44</b>	Count	297	238	154	127	52	1		869
	Average earnings	\$43,724	\$57,882	\$62,180	\$68,155	\$70,901	- <sup>1</sup>		-
<b>45–49</b>	Count	266	235	167	131	206	51	4	1,060
	Average earnings	\$40,817	\$51,790	\$53,658	\$63,744	\$69,627	\$83,148	\$50,239	\$55,777
<b>50–54</b>	Count	240	214	188	123	187	148	48	1,148
	Average earnings	\$43,295	\$46,215	\$44,292	\$57,570	\$63,842	\$67,987	\$67,793	\$53,087
<b>55–59</b>	Count	135	137	170	87	114	73	87	803
	Average earnings	\$43,771	\$42,252	\$41,595	\$53,909	\$54,626	\$63,360	\$69,174	\$50,224
<b>60–64</b>	Count	46	74	77	59	42	24	35	357
	Average earnings	\$42,246	\$46,546	\$40,719	\$50,571	\$53,232	\$50,928	\$53,800	\$47,193
<b>&gt;=65</b>	Count	17	19	20	20	4	8	6	94
	Average earnings	\$42,725	\$40,530	\$41,561	\$51,672	\$45,607	\$59,724	\$58,596	\$46,520
<b>Total</b>	Count	1,720	1,317	936	564	605	305	180	5,627
	Average earnings	\$45,251	\$54,275	\$52,037	\$60,196	\$63,825	\$67,976	\$65,043	\$53,851

<sup>1</sup> Left intentionally blank for confidentiality.

## 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 <sup>1</sup>	Number	Average Annual Pension
<25	1	\$ 0		
25-29	5	\$ 1,969		
30-34	18	\$ 4,691		
35-39	35	\$ 3,658		
40-44	61	\$ 4,552	2	\$ 6,572
45-49	81	\$ 5,853	3	\$ 7,965
50-54	104	\$ 5,228	69	\$ 26,841
55-59	88	\$ 6,400	318	\$ 26,719
60-64	37	\$ 3,072	575	\$ 23,894
65-69	5	\$ 1,175	764	\$ 18,052
70-74			572	\$ 15,886
75-79			422	\$ 15,007
80-84			273	\$ 13,564
85-89			186	\$ 12,709
90-94			79	\$ 11,835
95+			25	\$ 11,300
<b>Total</b>	<b>435</b>	<b>\$ 5,146</b>	<b>3,288</b>	<b>\$ 18,437</b>

<sup>1</sup> 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, 2012	December 31, 2009
<b>Economic Assumptions</b>		
Discount rate	6.25% per annum, net of all expenses	6.75% per annum, net of all expenses
Inflation rate	2.25% per annum	Same
Increases in pensionable earnings	3.00% per annum	Same
Increases in year's maximum pensionable earnings ("YMPE")	3.00% per annum	Same
Increases in maximum pension limit	In accordance with <i>Income Tax Act</i> , then 3.00% per annum	Same
Interest on member contributions	4.25% per annum	N/A
Investment and non-investment expenses	Nil – discount rate has been reduced to reflect 0.20% for non-investment expenses and a net 0.10% for investment expenses (0.45% for gross investment expenses less 0.35% for additional return from active management)	Nil - taken into account in the discount rate assumption
Increase in pensions	Nil	Nil
Margin for adverse deviation	0.45% per annum, taken into account in the discount rate assumption	0.35% per annum, taken into account in the discount rate assumption
<b>Demographic Assumptions</b>		
Mortality	1994 Uninsured Pensioner Mortality Table projected generationally with scale AA <sup>1</sup>	Same
Retirement	60% at earliest unreduced retirement age and remainder at normal retirement date	Same

<sup>1</sup> Pre-retirement mortality was applied

## Appendix C: Going Concern Assumptions and Methods

	December 31, 2012	December 31, 2009
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%	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
<b>Methods</b>		
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

## Description of Actuarial Assumptions and Methods

### Economic Assumptions

#### Discount Rate

We have used a discount rate of 6.25% 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 0.45%.

The best estimate long-term net rate of investment return is 6.70% 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; and

## Appendix C: Going Concern Assumptions and Methods

- 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 6.75% 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 3.00% per year. The assumption reflects 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.

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

The salary increase assumption is unchanged from the previous valuation and is considered best estimate.

### 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.



## Appendix C: Going Concern Assumptions and Methods

### 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 \$2,696.67 in 2013. It is assumed that the maximum limit will increase at 3.00% per year commencing in 2014. 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.

### Economic Margins for Adverse Deviations

Margins for conservatism or provisions for adverse deviation have been built into the going concern assumptions where appropriate.

The margins have been chosen so as to balance the need for financial security for existing Plan members against overly conservative contribution requirements that potentially result in intergenerational inequity among members and unnecessary financial strain on the contributing employers.

A margin for adverse deviations of 0.45% per annum has been reflected 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 the going-concern valuation, mortality rates have been assumed to be in accordance of the Uninsured Pensioner 1994 mortality table with generational projection using scale AA (UP94G). The

## Appendix C: Going Concern Assumptions and Methods

previous valuation also used the Uninsured Pensioner 1994 mortality table with generational projection using scale AA. The mortality assumption is considered to be best estimate.

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. 49.83 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. 45.07 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:

### Mortality per 1,000 lives - Male

Current age	Mortality per 1,000 lives at each future age				
	80	85	90	95	100
60	45.07	76.76	135.12	225.45	321.56
70	49.83	82.34	140.65	230.01	324.80
80	55.10	88.34	146.40	234.66	328.06
90	n/a	n/a	152.38	239.41	331.36

### Mortality per 1,000 lives – Female

Current age	Mortality per 1,000 lives at each future age				
	80	85	90	95	100
60	32.21	55.89	107.90	179.71	280.20
70	34.55	59.36	111.19	183.35	283.01
80	37.07	63.04	114.58	187.05	285.86
90	n/a	n/a	118.08	190.84	288.73

### 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.

## Appendix C: Going Concern Assumptions and Methods

### 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.

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

## Appendix C: Going Concern Assumptions and Methods

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 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 preretirement 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 5-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, 2012	December 31, 2009
<b>Economic Assumptions</b>		
Discount Rate		
Transfer value basis		
Active, disabled, inactive and deferred members not retirement eligible	2.40% for 10 years; 3.60% thereafter	3.90% for 10 years; 5.40% thereafter
Annuity purchase basis		
Retirement eligible active, disabled, inactive and deferred members and all retired members, survivors and beneficiaries	3.0% per annum	4.49% per annum
Maximum pension limit increases	Nil	Nil
<b>Demographic Assumptions</b>		
Mortality rates	1994 Uninsured Pensioner Mortality Table with fully generational projection scale AA	UP94 projected to 2020 using Scale AA
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, 2012	December 31, 2009
<b>Other</b>		
Wind up expenses	\$2,000,000	No change
Actuarial cost method	Unit credit	No change
Asset valuation method	Smoothed value of assets	No change
<b>Solvency Incremental Normal Cost</b>		
Increases in pensionable earnings	3.00% per annum plus increases due to seniority, merit, and promotion	N/A
Increases in YMPE	3.00% per annum	N/A
Increases in maximum pension limit	In accordance with <i>Income Tax Act</i> , then 3.00%	N/A
Inflation Rate	2.25%	N/A

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.

### 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.

## Appendix D: Solvency Assumptions and Methods

### 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 2.80% 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 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 5-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:

- § 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:

## Appendix D: Solvency Assumptions and Methods

- 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, 2012. 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** *City of Halifax Superannuation Plan;  
Halifax County Municipality Full-time Retirement Pension Plan;  
City of Dartmouth Employees' Retirement Plan; and  
Metropolitan Authority Employees' Pension Plan*

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.

Out of 5,627 active members in the Plan as at December 31, 2012, the number of active members still accruing service in the Prior Plans are as follows:

- 6 members in the *City of Halifax Superannuation Plan*;
- 6 members in the *Halifax County Municipality Full-time Retirement Pension Plan*;
- 11 members in the *City of Dartmouth Employees' Retirement Pension Plan*; and
- 1 member in the *Metropolitan Authority Employees' Pension Plan*

### **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"><li>• Earnings of at least 25% of the YMPE from employment with the municipality/participating employer; or</li><li>• 700 hours of employment with the municipality/participating employer.</li></ul>
<b>Contributions – Defined Benefit</b>	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.
<b>Contributions – Defined Contribution</b>	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.
<b>Earnings – Defined Benefit</b>	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.
<b>Earnings – Defined Contribution</b>	Overtime and other non-regular earnings as defined in the Plan.
<b>Normal Retirement</b>	
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

Subject to approval by the HRM Pension Committee, pensions in payment may be adjusted after April 1, 1998. The amount of increases shall be as provided by actual investment returns (net of expenses) in excess of 7.5% per year. The increases will be determined using cumulative investment returns since April 1, 1998 net of granted pensioner increases since that date and changes to the valuation interest rate.



## Appendix F: Administrator Certification

With respect to the Halifax Regional Municipality Pension Plan, forming part of the actuarial report as at December 31, 2012, 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, 2012; and
- § notified of all events occurring subsequent to the valuation date that could have an impact on the results of the valuation.

Name (print) of Authorized Signatory

Title

Signature

Date