Actuarial Valuation as at December 31, 2023 for Management Employees Pension Plan

December 12, 2024

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Executive Summary

An actuarial valuation has been prepared for the Management Employees Pension Plan (the "Plan") as at December 31, 2023 for the primary purpose of establishing a funding range in accordance with legislative requirements 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. The next actuarial valuation for the purposes of developing funding requirements should be performed no later than as at December 31, 2026.

Summary of Principal Results

Financial Position (000's)[1]

	December 31, 2023	December 31, 2021
Going Concern		
Assets	$ 6,426,371	$ 5,944,565
Liabilities	6,089,476	5,593,637
Excess/(Deficit)	**$ 336,895**	**$ 350,928**
Solvency		
Assets	$ 6,488,290	$ 6,546,024
Liabilities	6,464,658	7,295,221
Excess/(Deficit)	**$ 23,632**	**$ (749,197)**

Legislative Ratios

	December 31, 2023	December 31, 2021
Going concern funded ratio	1.0553	1.0627
Solvency ratio	1.0037	0.8973

[1] Net of all adjustments such as estimated wind up expenses, where applicable.

Contribution Requirements

Considering the funding status of the Plan, the contributions recommended in this report as a percentage of pensionable earnings, for the period from January 1, 2024 to December 31, 2026, are as follows:

	Jan 1, 2024 to Dec 31, 2026
Participants	12.00%
Employer	12.00%
Total	**24.00%**

These rates remain unchanged from those set out in the previous valuation, which became effective on April 1, 2023.

Membership Data

	December 31, 2023	December 31, 2021
Active members	5,454	4,901
Suspended members	251	273
Deferred vested members	1,064	991
Amounts held on deposit	375	376
Retired members and beneficiaries	6,836	6,373

Key Assumptions

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

	December 31, 2023	December 31, 2021
Going Concern		
Best estimate discount rate	6.35% per year	Same
Provision for adverse deviation	20% (explicit margin on liabilities) 19.7% (explicit margin on normal cost)	20% (explicit margin on liabilities) 18% (explicit margin on normal cost)
Inflation rate	2.00% per year	Same
Pensionable earnings - Base	3.00% for one year and 2.75% per year thereafter	2.75% per year
Pensionable earnings – Merit and Promotion	2.0% up to age 40, declining uniformly to 0.80% at age 45, and decreasing to 0.5% per year at age 52 and thereafter	Same
Maximum pension limit	2.75% per year	Same
Mortality table	95% of 2014 Canadian Public Sector Pensioner Mortality with generational improvements using Scale MI-2017	Same
Retirement rates	Rates following 2021 Experience Study	Same

	December 31, 2023	December 31, 2021
Solvency		
Discount rate (net of indexation)	Annuity purchases: 2.64% per year Transfers: 3.66% per year	Annuity purchases: 0.80% per year Transfers: 3.71% per year
Pensionable earnings	Not applicable	Same
Mortality table	Annuity Purchase: 2014 Canadian Pensioner Mortality Table with generational improvements using CPM Scale B Transfers: 95% of 2014 Canadian Public Sector Pensioner Mortality with generational improvements using Scale MI-2017	Same
Retirement rates	Annuity Purchase: Age 55 or current age if older Transfers: Earliest unreduced age	Same

Section 1: Introduction

Purpose and Terms of Engagement

We have been engaged by the Management Employees Pension Board, and hereafter referred to as the MEP Board, to conduct an actuarial valuation of the Plan, as at December 31, 2023 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. Specifically, the purposes of the valuation are to:

- Determine the financial position of the Plan on a going concern basis as at December 31, 2023;
- Determine the financial position of the Plan as at December 31, 2023 on a solvency basis;
- Determine the funding requirements of the Plan as at December 31, 2023; and
- Provide the necessary actuarial certification required under the *Public Sector Pension Plans Act* (the *"Act"*) and the *Income Tax* Act.

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

The next required valuation will be as at December 31, 2026.

Summary of Changes Since the Last Valuation

The last such actuarial valuation in respect of the Plan was performed as at December 31, 2021. Since the time of the last valuation, we note that the following events have occurred:

- Going concern actuarial assumptions and methods have been revised. The changes are summarized in Appendix C.
- Solvency assumptions have been revised. The changes are summarized in Appendix D.

MEP Board 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, 2021;
- A copy of the Statement of Investment Policies and Procedures for the Plan ("SIPP");
- A copy of the funding policy for the MEP Board;
- Membership data compiled as at December 31, 2023 by Alberta Pension Services Corporation ("APS");
- Asset data taken from the Plan's audited financial statements; and
- A copy of the latest regulations and amendments up to and including December 31, 2023.

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

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, 2023 will result in gains or losses which will be reflected in the next actuarial valuation report.
- 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 the MEP Board, 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, 2023 is shown in the following table. The results as at December 31, 2021 are also shown for comparison purposes.

Going Concern Financial Position

	December 31, 2023	December 31, 2021
Actuarial Value of Assets	**$6,426,371,000**	**$5,944,565,000**
Going Concern Liabilities		
Active members	$ 1,611,560,000	$ 1,469,296,000
Suspended members	23,961,000	20,503,000
Deferred vested members	242,277,000	235,786,000
Amounts held on deposit	11,874,000	11,816,000
Retired members and beneficiaries	4,202,301,000	3,858,111,000
Payments due on buybacks	(2,497,000)	(1,875,000)
Total Liabilities	**$6,089,476,000**	**$5,593,637,000**
Actuarial Excess/(Unfunded Liability)	**$ 336,895,000**	**$ 350,928,000**
Going Concern Funded Ratio	**1.0553**	**1.0627**

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Going Concern Normal Cost

On the basis of the Plan provisions, membership data, going concern assumptions and methods, asset information and legislative requirement described in the Appendices, the going concern normal cost of the Plan as at December 31, 2023 is shown in the following table. The normal cost as at December 31, 2021 is also shown for comparison purposes.

	December 31, 2023	December 31, 2021
Normal Cost		
Current service cost	$ 165,978,000	$ 136,510,000
Provision for non-investment expenses	2,813,000	2,314,000
Total Normal Cost	**$ 168,791,000**	**$ 138,824,000**
Total pensionable earnings (in year following valuation date)	$ 703,179,000	$ 578,530,000
Total Normal Cost		
As a % of total pensionable earnings	24.00%	24.00%

Change in Financial Position

The major components of the change in the Actuarial Excess for the period from December 31, 2021 to December 31, 2023 are summarized in the following table.

Actuarial Excess as at December 31, 2021	**$**	**350,928,000**
Expected interest on actuarial excess/(unfunded liability)		45,983,000
Actuarial Excess as at December 31, 2023	**$**	**396,911,000**
Change in Financial Position due to Experience Gains/(Losses)		
Loss from investment earnings lower than expected	$	(18,528,000)
Gain due to contribution in excess of benefits earned		18,563,000
Loss due to salary increases greater than expected		(3,174,000)
Loss due to indexation experience		(177,328,000)
Gain due to retirement experience		6,816,000
Loss due to mortality experience		(12,721,000)
Loss due to termination experience		(6,940,000)
Gain due to release of explicit margin		114,200,000
Net gain due to other experience and miscellaneous items		21,031,000
Actuarial Excess After Experience Gains/(Losses) as at December 31, 2023	**$**	**338,830,000**
Economic Assumptions		
Change due to pensionable earnings increases	$	(1,935,000)
Actuarial Excess as at December 31, 2023	**$**	**336,895,000**

Discussion of Changes in Economic Assumptions

Effective December 31, 2023, the base pensionable earnings increase assumption was changed from 2.75% per year to 3.00% for one year and 2.75% per year thereafter. This increased the going concern liabilities by $1,935,000 and the total normal cost by $257,000 (a decrease of 0.01% of pensionable earnings).

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Going Concern Valuation Sensitivity Results

In accordance with the CIA Standards of Practice specific to pension plans, the table below presents the sensitivity of the going concern liabilities and the total normal cost of using a discount rate 1% lower and 1% higher than that used for the going concern valuation.

December 31, 2023		Effect	
		$	%
Going concern liabilities	$ 6,089,476,000		
Going concern liabilities (discount rate – 1%)	$ 6,888,284,000	798,808,000	13.1%
Going concern liabilities (discount rate + 1%)	$ 5,442,001,000	(647,475,000)	-10.6%
Normal cost	$ 165,978,000		
Normal cost (discount rate – 1%)	$ 204,315,000	38,337,000	23.1%
Normal cost (discount rate + 1%)	$ 138,026,000	(27,952,000)	-16.8%

Plausible Adverse Scenarios

In accordance with the Canadian Institute of Actuaries Standards of Practice specific to pension plans, below is summarized scenarios of adverse but plausible assumptions, relative to the best estimate assumptions otherwise selected for the valuation.

Interest Rate Sensitivity

The table below presents the sensitivity of the going concern position of using interest rates 1% lower than the current level. Equity risk premiums are assumed to remain unchanged, so the future return on all asset classes and the going concern discount rate both decrease by 1%. In order to calculate the impact on the Actuarial Value of Assets, the decrease in interest rates only impacts fixed income assets (assumed to be 31.5% of total assets) and a duration of 6.70 (based on relevant fixed income benchmarks) was considered. We have applied the asset smoothing methodology in this scenario.

	Base Scenario	Adverse Scenario	Impact ($)
Actuarial value of assets	$ 6,426,371,000	$6,472,077,000	$ 45,706,000
Going concern liabilities	6,089,476,000	6,888,284,000	798,808,000
Actuarial Excess/(Unfunded Liability)	**$ 336,895,000**	**$ (416,207,000)**	**$(753,102,000)**
Total Normal Cost			
Jan 1, 2024 to Dec 31, 2024	$ 168,791,000	$ 207,128,000	$ 38,337,000
Jan 1, 2025 to Dec 31, 2025	$ 173,433,000	$ 212,824,000	$ 39,391,000
Jan 1, 2026 to Dec 31, 2026	$ 178,202,000	$ 218,677,000	$ 40,475,000

The normal cost increases as indicated above due to the reduction in the interest rate and the inclusion of PfAD.

Deterioration in Asset Value

In assessing the risk related to the deterioration in asset value we have chosen an adverse scenario equal to a 15% reduction in the non-fixed income asset values and assume no change in future return expectations.

The table below presents the sensitivity of the going concern position of using the assets with a 15% reduction in non-fixed income asset values. We have applied the asset smoothing methodology in this scenario.

	Base Scenario	Adverse Scenario	Impact ($)
Actuarial value of assets	$ 6,426,371,000	$ 6,205,421,000	$ (220,950,000)
Going concern liabilities	6,089,476,000	6,089,476,000	-
Actuarial Excess/(Unfunded Liability)	**$ 336,895,000**	**$ 115,945,000**	**$ (220,950,000)**
Total Normal Cost			
Jan 1, 2024 to Dec 31, 2024	$ 168,791,000	$ 168,791,000	$ -
Jan 1, 2025 to Dec 31, 2025	$ 173,433,000	$ 173,433,000	$ -
Jan 1, 2026 to Dec 31, 2026	$ 178,202,000	$ 178,202,000	$ -

Mortality Sensitivity

The table below presents the sensitivity of the going concern position of the Plan to using a mortality assumption with a 10% improvement to the base mortality rates. For t8he purposes of this analysis, we have used 90% of the rates of the base table used in the going concern valuation.

	Base Scenario	Adverse Scenario	Impact ($)
Actuarial value of assets	$ 6,426,371,000	$ 6,426,371,000	$ -
Going concern liabilities	6,089,476,000	6,199,443,000	109,967,000
Actuarial Excess/(Unfunded Liability)	**$ 336,895,000**	**$ 226,928,000**	**$ (109,967,000)**
Total Normal Cost			
Jan 1, 2024 to Dec 31, 2024	$ 168,791,000	$ 170,586,000	$ 1,795,000
Jan 1, 2025 to Dec 31, 2025	$ 173,433,000	$ 175,277,000	$ 1,844,000
Jan 1, 2026 to Dec 31, 2026	$ 178,202,000	$ 180,097,000	$ 1,895,000

Section 3: Solvency Valuation Results

Solvency Financial Position of the Plan

The solvency valuation is a financial assessment of the Plan that is required by the *Act* and is performed in accordance with requirements prescribed by that legislation. It is intended to provide an assessment of the Plan's financial position at the valuation date on the premise that certain obligations as prescribed by the *Act* are settled on the valuation date for all members. All assumptions for the solvency valuation are listed in Appendix D. The *Act* does not require funding based on the solvency valuation results.

On the basis of the Plan provisions, membership data, solvency assumptions and methods and asset information described in the Appendices, as well as the requirements of the *Act*, the solvency financial position of the Plan as at December 31, 2023 is shown in the following table. The solvency financial position of the Plan as at December 31, 2021 is shown for comparison purposes.

Solvency Financial Position

	December 31, 2023	December 31, 2021
Assets		
Market value of assets	$ 6,499,990,000	$6,557,724,000
Estimated wind up expenses	(11,700,000)	(11,700,000)
Solvency Assets	**$6,488,290,000**	**$6,546,024,000**
Solvency Liabilities		
Active members	$ 1,807,443,000	$ 1,968,205,000
Suspended members	28,503,000	29,207,000
Deferred vested members	288,199,000	335,876,000
Amounts held on deposit	9,895,000	9,847,000
Retired members and beneficiaries	4,333,115,000	4,953,961,000
Payments due on buybacks	(2,497,000)	(1,875,000)
Total Liabilities	**$6,464,658,000**	**$7,295,221,000**
Solvency Excess/(Deficiency)	**$ 23,632,000**	**$ (749,197,000)**
Solvency Ratio	**1.0037**	**0.8973**

Solvency Valuation Sensitivity Results

In accordance with the CIA Standards of Practice specific to pension plans, the table below presents the sensitivity of the solvency liabilities to using a discount rate of 1% lower and 1% higher than that used for the solvency valuation.

December 31, 2023		Effect	
		$	%
Solvency liabilities	$ 6,464,658,000		
Solvency liabilities (discount rate – 1%)	$ 7,410,616,000	$ 945,958,000	14.6%
Solvency liabilities (discount rate + 1%)	$ 5,708,611,000	$ (756,047,000)	-11.7%

Incremental Cost on a Solvency Basis

The incremental cost on a solvency basis represents the present value at December 31, 2023 of the expected aggregate change in the solvency liabilities between December 31, 2023 and the next calculation date, that is December 31, 2026. 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 can be found in the following table.

	2024	2025	2026
Incremental cost on a solvency basis	$274,244,000	$ 273,511,000	$286,885,000

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 following table sets out:

- The development of the rule to determine the normal cost until the next actuarial funding recommendation is certified; and
- An estimate of the normal cost for the 3 year(s) following the valuation date.

	2024	2025	2026
Normal Cost			
Current service cost	$ 165,978,000	$ 170,542,000	$ 175,232,000
Provision for non-investment expenses	2,813,000	2,891,000	2,970,000
Total Normal Cost	**$ 168,791,000**	**$ 173,433,000**	**$ 178,202,000**
Total pensionable earnings	$ 703,179,000	$ 722,516,000	$ 742,386,000
Total Normal Cost			
As a % of pensionable earnings	24.00%	24.00%	24.00%

In the event an updated funding range in accordance with legislative requirements is not certified before December 31, 2026, the rule for determining the total normal cost contributions outlined in the above table will continue to be appropriate for the plan year commencing on the next valuation date of December 31, 2026. Adjustment to the total contributions may be required once the next actuarial funding range in accordance with legislative requirements is certified.

Development of Special Payments

The Plan has a going concern actuarial excess of $336,895,000 as at December 31, 2021. Therefore, no special payments are required on a going concern basis.

Excess Surplus

The *Income Tax Act* requires that any excess surplus first be applied to reduce or eliminate the company contribution requirements. 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.

Since the surplus is less than 25% of the going concern liabilities, there is no excess surplus and therefore it does not impact the development of the company contribution requirements.

Total Contribution

Under the Income Tax Act, the total contribution must be no more than (i) the total normal cost, plus (ii) where an unfunded actuarial liability exists, the amount of the unfunded actuarial liability, less (iii) any excess surplus.

The following table outlines the range of funding contributions that would be permitted under the *Income Tax Act* and the *Act* based on the valuation at December 31, 2023, as a percentage of pensionable earnings.

	Minimum Required	Maximum Required
Total normal cost	24.00%	24.00%
Special payments toward amortizing unfunded liability	-	-
Required application of excess surplus	-	-
Minimum Required Total Contribution	**24.00%**	**24.00%**

Based on the Plan's funding policy, the Board has recommended that current service contribution rates are split equally between employers and active members – 50% for each. Based on this, funding contributions as a percentage of pensionable earnings should be split as follows:

	2024	2025	2026
Employee Contributions	12.00%	12.00%	12.00%
Employer Contributions	12.00%	12.00%	12.00%
Minimum Required Total Contribution	**24.00%**	**24.00%**	**24.00%**

Section 5: Actuarial Certificate

Actuarial Opinion, Advice and Certification for the Management Employees Pension Plan

Opinion

This actuarial certification forms an integral part of the actuarial valuation report for the Plan as at December 31, 2023. I confirm that I have prepared an actuarial valuation of the Plan as at December 31, 2023 for the purposes outlined in the Introduction section to this report and consequently:

My advice on funding is the following:

- Contributions in the amounts within the range of minimum and maximum contribution amounts as outlined in Section 4 of this report should be made to the Plan, in accordance with legislative requirements.
- The next actuarial valuation for the purpose of developing funding requirements should be performed no later than as at December 31, 2026.

I hereby certify that, in my opinion:

- The contribution range as outlined in this report is expected to be sufficient to satisfy the Plan's funding requirements.
- The employer contribution range outlined in this report qualifies as 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.

John Slipp, FCIA, FSA
Partner

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October 2024

Appendix A: Assets

Asset Data

The Plan's assets are held in trust by the President of the Treasury Board and the Minister of Finance and invested by Alberta Investment Management Corporation. The asset information presented in this report is based on the financial statements of the pension fund prepared by Alberta Treasury Board and Finance|.

Tests of the sufficiency and reliability of the asset data were performed and the results were satisfactory. The tests included:

- A reconciliation of actual cash flow with expected cash flow from the previous actuarial report; and
- A reconciliation of any anticipated benefit payments (for retirees, terminated, or deceased members) against the financial statements of the pension fund for confirmation of payments.

Market Value of Assets

The following is a summary of the composition of the Plan's assets by asset type as reported by Alberta Treasury Board and the Minister of Finance as at December 31, 2023. For comparison purposes, the composition at the previous valuation date of December 31, 2021 is also shown.

	December 31, 2023		December 31, 2021	
	$ (000's)	%	$ (000's)	%
Money market and fixed income	1,449,667	22.3	847,674	12.9
Canadian equities	498,678	7.7	1,008,018	15.4
Foreign equities	1,944,101	29.9	2,349,463	35.8
Private equities	640,551	9.9	438,756	6.7
Real estate	963,016	14.8	866,436	13.2
Infrastructure	791,989	12.2	686,051	10.5
Renewable resources	196,350	3.0	39,916	0.6
Real return bonds	-	-	304,582	4.6
Strategic, tactical and currency investments	15,458	0.2	16,590	0.3
Total Invested Assets	**6,499,810**	**100.0**	**6,557,486**	**100.0**

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Target Asset Mix

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

	Minimum	Target	Maximum
Money Market and Fixed Income	**15.0%**	**20.0%**	**30.0%**
Cash	0.0%	0.5%	5.0%
Universe bonds	5.0%	10.0%	25.0%
Mortgages	0.0%	4.5%	7.0%
Private debt	0.0%	5.0%	10.0%
Inflation Sensitive	**22.5%**	**35.0%**	**47.5%**
Real estate	10.0%	17.5%	22.5%
Infrastructure	7.5%	14.0%	20.0%
Renewable resources	0.0%	3.5%	6.0%
Real return bonds	0.0%	0.0%	7.5%
Equity	**30.0%**	**45.0%**	**55.0%**
Canadian equities	0.0%	7.5%	10.0%
Global equities	10.0%	22.5%	40.0%
Emerging markets equities	0.0%	5.0%	10.0%
Private equity	2.5%	10.0%	15.0%
		100.0%	

Reconciliation of Changes in Market Value of Assets

The table below reconciles changes in the adjusted market value of assets between December 31, 2021 and December 31, 2023.

	2022	2023
Adjusted Market Value of Assets, Beginning of Plan Year	**$ 6,557,724,000**	**$ 6,119,511,000**
Contributions During Plan Year		
Member contributions	$ 79,505,000	$ 78,564,000
Employer contributions	81,992,000	78,422,000
Total	**$ 161,497,000**	**$ 156,986,000**
Benefit Payments During Plan Year		
Non-retired members	$ (28,500,000)	$ (20,826,000)
Retired members	(257,871,000)	(273,741,000)
Total	**$ (286,371,000)**	**$ (294,567,000)**
Net Transfers During Plan Year		
Into plan	$ -	$ 7,102,000
Out of plan	(1,653,000)	-
Total	**$ (1,653,000)**	**$ 7,102,000**
Fees/Expenses		
Investment expenses	$ (40,186,000)	$ (50,508,000)
Non-investment expenses	(2,502,000)	(2,449,000)
Total	**$ (42,688,000)**	**$ (52,957,000)**
Investment Income	**$ (268,998,000)**	**$ 563,915,000**
Adjusted Market Value of Assets, End of Plan Year	**$ 6,119,511,000**	**$ 6,499,990,000**
Rate of Return, Net of Investment Expenses	**-4.8%**	**8.5%**

Development of Adjusted Market Value of Assets

The adjusted market value of assets is equal to the market value of assets adjusted to reflect any contributions, benefit payments, transfers and fees/expenses in-transit as of the valuation date. The development of the adjusted market value of assets is shown below.

	December 31, 2023 (000's)	December 31, 2021 (000's)
Market value of assets	$ 6,499,810	$ 6,557,486
Contributions receivable	521	565
Accounts payable	(620)	(763)
Accrued investment income and accounts receivable	279	436
Adjusted Market Value of Assets	**$ 6,499,990**	**$ 6,557,724**

Development of Actuarial Value of Assets

The actuarial value of assets is determined by modifying the adjusted market value of assets to recognize asset gains (losses) (i.e., the difference between actual investment return and expected investment return based on the valuation discount rate assumption) over a 5-year period.

The development of the actuarial value of assets as of December 31, 2023 is shown below:

Year Ending (000's)	Original Amount of (Gain) Loss	(Gain) Loss Admitted in Prior Years	(Gain) Loss Admitted in 2023	(Gain) Loss to be Admitted in Future Years
December 31, 2019	$ (370,890)	$ (296,712)	$ (74,178)	$ -
December 31, 2020	178,887	107,332	35,777	35,778
December 31, 2021	(770,021)	(308,009)	(154,009)	(308,003)
December 31, 2022	624,105	124,821	124,816	374,468
December 31, 2023	(219,834)	-	(43,972)	(175,862)
			$ (111,566)	$ (73,619)
Adjusted Market Value of Assets, December 31, 2023				**$ 6,499,990**
Actuarial Value of Assets, December 31, 2023				**$ 6,426,371**

Appendix B: Membership Data

Source of Data

This valuation was based on member data provided by APS as of December 31, 2023. Tests of the sufficiency and reliability of the member data 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 2 years of credited service from December 31, 2021, notwithstanding increases due to service purchases during the inter-valuation period. This test also revealed any members who accrued less than two year of credited service;
- 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 any stated benefit payments since December 31, 2021 (for retired, terminated, or deceased members) against the financial statements of the pension fund for confirmation of the payments; and
- 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:

- 2023 Earnings: If earnings were available for 2018 to 2022, the most recent data was utilized and increased to 2023 using the salary increase assumptions from the previous valuation. Otherwise, the overall average of the group was utilized.

A copy of the administrator certification certifying the accuracy and completeness of the member data is included in Appendix G of this report.

Payments Due

In this report, a negative liability is held for payments due on buybacks. These amounts represent contributions to be made by Plan participants after the valuation date to buy back certain periods of service. The valuation includes the effect of these buybacks in the liabilities. Per the valuation data received from APS, the amount of payments due for buyback service as at December 31, 2023 was $2,497,000. As at December 31, 2021, this amount was $1,875,000. For the purpose of the balance sheet presentation, these amounts appear as reductions to the total liabilities as the pension liabilities for participants purchasing such service have been determined assuming the full amount of service has been bought.

AON

Membership Summary

The table below reconciles the number of members as of December 31, 2023 with the number of members as of December 31, 2021 and the changes due to experience in the period.

	Actives	Suspended	Deferreds	HODs	Retired	Survivors	Total
Members, December 31, 2021	**4,901**	**273**	**991**	**376**	**5,719**	**654**	**12,914**
Changes due to:							
New entrants	1,437	-	-	-	-	-	1,437
Termination							
Non-vested	(88)	(1)	-	89	-	-	-
Deferred vested	(288)	(20)	308	-	-	-	-
Lump sum	(139)	(9)	(82)	(77)	-	-	(307)
Death							
No further benefits	-	-	-	-	(35)	(13)	(48)
Lump sum	(4)	-	(2)	-	(10)	-	(16)
Surviving beneficiary	(7)	(1)	(1)	-	(161)	170	-
New beneficiary	-	-	-	-	-	-	-
Retirement	(400)	(20)	(92)	-	512	-	-
Transfer	42	29	(60)	(11)	-	-	-
Data correction	-	-	2	(2)	2	(2)	-
Net change	553	(22)	73	(1)	308	155	1,066
Members, December 31, 2023	**5,454**	**251**	**1,064**	**375**	**6,027**	**809**	**13,980**

Active Members

	December 31, 2023	December 31, 2021
Number	5,454	4,901
Average age	48.6	49.1
Average credited service	8.2	9.0
Average pensionable earnings	$ 135,194	$ 127,627
Proportion female	54.5%	53.0%

Suspended Members

	December 31, 2023	December 31, 2021
Number	251	273
Average age	51.6	50.1
Average credited service	3.4	3.0
Average pensionable earnings	$ 101,571	$ 96,486
Proportion female	53.4%	59.0%

Deferred Members

	December 31, 2023	December 31, 2021
Number	1,064	991
Average age	49.9	49.5
Average annual pension	$ 19,645	$ 18,705
Proportion female	55.5%	53.7%

Participants with Amounts Held-on Deposit

	December 31, 2023	December 31, 2021
Number	375	376
Average age	49.3	48.4
Average contributions with interest	$ 25,272	$ 25,841
Proportion female	51.2%	52.4%

Retired Members

	December 31, 2023	December 31, 2021
Number	6,027	5,719
Average age	71.8	70.9
Average annual lifetime pension	$ 42,632	$ 40,746
Proportion female	35.9%	33.7%

Survivors

	December 31, 2023	December 31, 2021
Number	809	654
Average age	76.6	75.4
Average annual lifetime pension	$ 34,054	$ 31,862
Proportion female	88.3%	88.7%

Active Membership Distribution

The following table provides a detailed summary of the active membership at the valuation date by years of credited service and by age group. Average salary has not been limited to pensionable salary. The overall average salary limited to pensionable salary and excluding those members with 35 or more years of service (i.e. average contributory earnings) is $130,738. For privacy reasons, average pensionable earnings is not shown for groups with one member.

Age	<5	5-10	10-15	15-20	20-25	25-30	30-35	>=35	Total
< 30	45								45
	$103,428								$103,428
30-35	273	21							294
	$117,323	$120,179							$117,527
35-40	471	179	21	1					672
	$121,323	$138,105	$137,318	*					*
40-45	493	297	160	24	2				976
	$121,927	$135,309	$147,900	$160,439	$155,483				$131,273
45-50	356	308	214	136	19				1,033
	$121,757	$127,748	$148,158	$171,488	$196,731				$136,939
50-55	266	259	206	205	61	8	3		1,008
	$125,070	$129,655	$143,715	$159,213	$176,146	$148,692	$170,092		$140,415
55-60	185	171	171	185	83	38	2		835
	$127,785	$133,007	$134,153	$152,422	$177,329	$179,525	$134,048		$142,911
60-65	65	86	99	110	57	24	7	2	450
	$122,508	$126,338	$134,092	$141,201	$160,162	$195,030	$146,292	*	*
>=65	24	35	20	38	12	3	4	5	141
	$140,404	$136,965	$131,710	$139,687	$159,723	$196,078	$172,826	$150,215	$142,220
Total									
Count	**2,178**	**1,356**	**891**	**699**	**234**	**73**	**16**	**7**	**5,454**
Average Earnings	**$121,912**	**$131,830**	**$142,209**	*****	**$173,325**	**$181,924**	**$155,858**	*****	**$135,194**

Deferred Vested/Retired Membership Distribution

The following table provides a detailed summary of the deferred vested/retired membership at the valuation date by age group. For privacy reasons, average pensions are not shown for groups with one member.

Age	Retired Members and Beneficiaries	Deferred Vested Members
< 50	11	536
Average Lifetime Pension	$23,009	$15,310
50–55	12	238
Average Lifetime Pension	$32,331	$25,922
55–60	299	183
Average Lifetime Pension	$40,376	$22,904
60–65	896	70
Average Lifetime Pension	$37,615	$20,095
65–70	1,473	34
Average Lifetime Pension	$39,468	$26,037
70–75	1,589	2
Average Lifetime Pension	$43,156	*
75–80	1,363	1
Average Lifetime Pension	$44,295	*
80–85	824	
Average Lifetime Pension	$44,054	
>=85	369	
Average Lifetime Pension	$39,813	
Total		
Count	**6,836**	**1,064**
Average Lifetime Pension	**$41,617**	**$19,645**

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.

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.

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

	December 31, 2023	December 31, 2021
Economic Assumptions		
Best estimate discount rate	6.35% per year	Same
Inflation rate	2.00% per year	Same
Productivity increases	1.00% for one year and 0.75% per year thereafter	0.75% per year
Merit increases	2.0% up to age 40, declining uniformly to 0.8% per year at age 45, then decreasing to 0.5% per year at age 52 and thereafter	Same
Increases in pensionable earnings	3.00% for one year and 2.75% per year thereafter	2.75% per year
Increases in maximum pension limit	$3,610.00 in 2024; then 2.75% per year	$3,420.00 in 2022; then 2.75% per year
Interest on member contributions	Inflation rate plus 2.0% per year (4.0% per year)	Same
Investment expenses net of active management	0.18% per year (taken into account in the discount rate assumption)	0.15% per year (taken into account in the discount rate assumption)
Non-investment expenses	0.4% of total earnings per year (taken into account in the normal cost calculation)	Same
Margin for adverse deviation	20% explicit margin on liabilities 19.7% explicit margin on normal cost	20% explicit margin on liabilities 18% explicit margin on normal cost

	December 31, 2023	December 31, 2021
Demographic Assumptions		
Mortality table	95% of 2014 Canadian Public Pensioner Mortality Table with generational improvements using Scale MI-2017 (sex-distinct rates)	Same
Retirement rates	Rates following 2021 experience study (Table A following) for Active members 100% at first unreduced age for deferred vested members	Same
Termination rates	Rates following 2021 experience study (Table B following)	Same
Disability rates	None	Same
Proportion with pension partner		
Non-retired proportion with pension partner	80%	Same
Non-retired pension partner age differential	Males two years older	Same
Retired members	Actual relationship status and ages are used	Same
Termination option election		
Deferred pension	75%	Same
Lump sum	25%	Same
Lump sum interest rate	Same as above	Same
Margin for adverse deviation	None	Same

	December 31, 2023	December 31, 2021
Methods		
Actuarial cost method	Projected unit credit	Same
Asset valuation method	Market value of assets adjusted to reflect contributions, benefit payments, transfers and fees/expenses in transit as of the valuation date	Same

Table A—Retirement Rates

Age-based retirement rates are in accordance with the following table:

Age	Rate (%)	
	Not Eligible for an Unreduced Pension	Eligible for an Unreduced Pension
55	15.0	25.0
56	12.0	20.0
57 – 59	15.0	20.0
60 – 63		20.0
64		25.0
65		40.0
66 – 68		30.0
69		20.0
70		50.0
71		100.0

Table B—Termination Rates

Age-based termination rates are in accordance with the following table:

Age	Rate (%)
Under 35	10.0
35 – 39	7.5
40 – 44	6.0
45 – 54	5.0

Justification of Actuarial Assumptions and Methods

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 Plan sponsor.

The actuary has discussed the Plan's experience with the MEP Board and compared it to the expected experience. This review indicates that there is a need for use of margins for adverse deviations. The margins for adverse deviations incorporated in the assumptions reflect this review and the MEP Board's desire to maintain safety cushions. The actuary has discussed with the MEP Board the implications of incorporating margins for adverse deviations and the MEP Board is fully cognizant and supports incorporating margins for adverse deviations.

The going concern assumptions do not include margins for adverse deviations, except as noted below.

Economic Assumptions

Discount Rate

The overall expected return was developed using best-estimate returns for each major asset class in which the pension fund is invested. A Monte Carlo simulation is performed over 30 years where the portfolio returns are projected assuming annual rebalancing. The results are used to develop an overall best-estimate rate of return for the entire pension fund. Gains from rebalancing and diversification are implicit to this return.

The overall expected return has been established based on the MEP Board's investment policy and its funding policy (whether formal or informal) and objectives. There may be some barriers to achieving this return such as inflation higher than expected, asset returns lower than expected, and assets and liabilities that are mismatched.

The following table lays out the adjustments that have been made to the overall expected rate of return in order to arrive at our going concern discount rate assumption:

Development of Discount Rate				
Overall expected return				6.53%
Investment expenses				
Passive	(1)	(0.18)%		
Actively managed	(2)	(0.42)%		
			(1)+(2)	(0.60)%
Additional returns due to active management				0.42%
Rounded Best Estimate Discount Rate				**6.35%**

Inflation Rate

The inflation rate assumption reflects our best estimate of future inflation considering current economic and financial market conditions.

Productivity Increases

The productivity increase assumption reflects our best estimate of future increases considering current economic and financial market conditions, and is consistent with historical real economic growth.

Merit Increases

We assume rates of increase as a result of individual employee merit and promotion based on a scale which varies by age as described above. The merit and promotion scale is based on the 2021 experience study and MEP Board input.

Increases in Pensionable Earnings

The assumption for increases in pensionable earnings reflects the assumed rate of inflation plus allowances for the effect of productivity growth.

Increases in the Maximum Pension Limit

Pensions are limited to the maximum limits under the *Income Tax Act*. The *Income Tax Act* specifies both a dollar limit, and in addition pensions cannot exceed 2% of indexed highest average compensation per year of credited service. The assumed increase in the dollar limit reflects the assumed rate of inflation plus the productivity increase assumption.

Increases in the Member Contributions

Interest is credited on member contributions with the rate credited by chartered banks on five-year personal fixed term deposits. The assumption for interest on member contributions reflects our expected increase in these rates, and is consistent with historical rates.

Expenses

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

Based on past Plan experience, administrative expenses are assumed to be 0.4% of pensionable earnings. This amount is included in the normal cost rate.

Economic Margins

The liabilities hold explicit margins on both liabilities and on total service costs. The margin held on liabilities is based on the Plan's funding policy and funded position. A separate decision on the total service cost margin is made to balance the need for financial security for existing Plan members against overly conservative contribution requirements. The explicit margin applied to the liabilities as at December 31, 2023 is 20% and the explicit margin applied to the normal cost as at December 31, 2023 is 19.7%.

Demographic Assumptions

Mortality

At the current valuation, we are using the 2014 Canadian Pensioner Mortality Table, with pension size adjustments factor and with mortality improvements in accordance with MI-2017.

In 2017, the CIA released a research paper introducing a new Mortality Improvement Scale (MI-2017) and subsequently published an Education Note stating that both the MI-2017 and CPM-B Scales "constitute broad and relevant mortality improvement studies for the Canadian population." The MI-2017 projection scale has been used for the purposes of this valuation since this scale takes into account a broader thinking on mortality improvements.

A review of the pension size adjustment was completed, determining a 95% size adjustment.

Retirement

Retirement rates are typically developed taking into account the past experience of the Plan. Accordingly, the rates of retirement have been developed based on the 2021 experience study and are considered best-estimate rates of retirement based on the Plan provisions.

As in the previous valuation, all participants in receipt of disability benefits from an employer's approved long-term disability plan are assumed to continue to be disabled until termination or retirement. As such, they are included as active participants.

Based on the results of the 2021 experience study, deferred members are assumed to retire at their first/earliest unreduced age or their current age if older.

Termination of Employment

A member's benefit entitlement under the Plan is affected by whether the member terminates employment prior to retirement for reasons other than death. In order to account for this 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 termination rates were developed based on the 2021 are considered to be best estimate.

Option Elections on Termination

We have assumed that a portion of members will elect a deferred annuity, while others will elect a commuted value transfer or cash on termination, based on the results of the 2021 experience study.

Disability

If an active Plan member becomes disabled, contributory service continues to accrue until unreduced pension commencement age, but 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. Use of an actual disability assumption in this case would reduce liabilities slightly, so a nil disability incidence assumption represents a small element of conservatism. The disability assumption has very little impact on the valuation results.

Proportion of Members with Pension Partners and Pension Partner Age Differential

These assumptions are relevant to the valuation of benefits since there is a subsidized joint and survivor benefit available for members with a pension partner. The proportion of members who will have a pension partner and the pension partner age difference assumptions are based on the 2021 experience study.

The pension partner age difference assumption has very little impact on the valuation results.

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 unit credit 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 preretirement 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. The projected unit credit actuarial cost method therefore allocates contributions among different periods in an orderly and rational manner for a stable population group.

In the event of future adverse experience, contributions in addition to the normal cost calculated under the projected unit credit actuarial cost method may be required to ensure that the Plan's 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 would asymptotically approach market value if rates of return matched assumptions. The method chosen does not deviate materially from market value, and additionally, we have set a corridor for the method to produce actuarial values between 85% and 105% of market value should the method produce an AVA outside of this range. The method does not have undue influence on investment transactions, i.e., sale of an asset will not have an impact on the AVA. A 5-year period of averaging was chosen which is within the typical range of an economic cycle. There is a conservative bias, as we believe there is a greater probability that the AVA will be lower than the MVA.

Other Methodologies

We have prepared a list of additional assumptions and methods used in the valuation of the Plan. This list is intended to assist users of this report in understanding the specific benefits valued. Small differences in methods and assumptions in a plan of this size can sometimes have effects in the millions of dollars. Appendix B of the report deals with data omission so they will not be repeated here.

- It is administrative practice for the Plan that indexation of deferred and immediate pension commences January 1 of the year following termination or retirement;
- Normal cost contributions are based on pensionable earnings below the maximum earnings limit described earlier in the report;
- The pensionable earnings for calculating normal cost percentage is nil for participants with 35 years of combined pensionable service; and
- Decrements are assumed to occur in the middle of the year.

Appendix D: Solvency Assumptions and Methods

Valuation Assumptions

	December 31, 2023	December 31, 2021
Economic Assumptions		
Discount rate		
Transfer value basis - Without indexation	4.90% per year	4.95% per year
Annuity purchase basis - Without indexation	4.57% per year	2.85% per year
Duration used to determine annuity purchase basis	9.65	11.12
Transfer value basis - With indexation	3.66% per year	3.71% per year
Annuity purchase basis - With indexation	2.64% per year	0.80% per year
Income Tax Act dollar limit	$3,610.00 per year	$3,420.00 per year
Demographic Assumptions		
Mortality table (transfer value)	95% of 2014 Canadian Public Penisoner Mortality Table with generational improvements using Scale MI-2017 (sex-distinct rates)	Same
Mortality table (annuity purchase)	2014 Canadian Pension Mortality Table with generational improvements using CPM Scale B (sex-distinct rates)	Same
Termination rates	Not applicable	Same
Retirement age		
Active and deferred vested members	100% at the member's earliest unreduced age	Same
Retired members and beneficiaries	Not applicable	Same
Termination of employment	Terminate with full vesting	Same
Relationship status		
Non-retired pension partner proportion	80%	Same

Non-retired pension partner age differential	Males two years older	Same
Retired members	Actual relationship status and ages are used	Same
Other		
Wind up expenses	$11,700,000	Same
Actuarial cost method	Unit credit	Same
Asset valuation method	Market value of assets adjusted to reflect contributions, benefit payments, transfers and fees/expenses in transit as of the valuation date	Same
Incremental Cost		
The assumptions for the expected benefit payments and decrement probabilities, service accruals, and projected changes in benefits and/or pensionable earnings	Same as going concern	Same

Based on the CIA's 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%

Postulated Scenario

The postulated scenario is the assumption of immediate termination of employment for the active group at the valuation date. Therefore, no allowance for future salary increases or demographic experience are reflected.

Benefits Valued

	Benefit
Vesting	We have treated all accrued benefits as vested on Plan wind up.
Post-Valuation Date Benefit Increases	Benefits are based on the average earnings and service at the valuation date.
Exclusions	According to the Plan provisions, the benefits to which a member would be entitled to if the Plan was terminated on the valuation date would include pension indexing of 60% of Alberta CPI. This indexing rate has been accounted for in the "With Indexation" discount rates summarized earlier in this Section.

Justification for Valuation Assumptions

We have set the aforementioned assumptions based on guidance prepared by the CIA Committee on Pension Plan Financial Reporting ("PPFRC") in the Educational Note Supplement – Guidance for Assumptions for Hypothetical Wind-Up and Solvency Valuations Update – Effective December 31, 2023, and Applicable to Valuations with Effective Dates on or after December 31, 2023, and no later than June 29, 2024 ("CIA Guidance") issued in January 2024.

For benefit entitlements that are expected to be settled by lump-sum transfer, we based the assumptions on those used in determining the going concern liabilities in this report, in accordance with the Management Employees Pension Plan Regulation.

For benefit entitlements that are expected to be settled by purchase of annuities, we based the assumptions on information compiled by the PPFRC from insurance companies active in the group annuity market as described in the educational note.

Development of Transfer Value Discount Rates

The Management Employees Pension Plan Amendment Regulation directs the Plan to calculate commuted values using the Plan's going concern assumption basis used in the current valuation, or any simplified assumption that would reasonably reflect those actuarial assumptions. The Plan has adopted a simplified discount rate assumption for these purposes of 4.90%, which would equate to approximately a 20% explicit margin on plan liabilities.

Development of Discount Rates

The development of the discount rates is shown below.

Solvency annuity purchase discount rate	= V39062 + Duration Adjustment
	= 3.05% +1.52%
	= 4.57% per year

Mortality Table

The derivation of the annuity purchase discount rate above is in conjunction with CPM2014 in accordance with the CIA Guidance.

Preretirement Mortality

We have made no allowance for preretirement 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.

Pensionable Earnings

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

Assumptions Not Needed

The following are not relevant to the solvency valuation:

- Increases in pensionable earnings;
- Increases in Year's Maximum Pensionable Earnings;
- Increases in *Income Tax Act* maximum pension limit; and
- 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.

Actuarial Cost Methods

Unit credit (accrued benefit) cost method as prescribed.

Asset Valuation Method Considerations

Assets for solvency purposes have been determined using market value with adjustments for:

- In-transit items at the valuation date; and
- Expenses for Plan termination as outlined above.

Incremental Cost

The incremental cost represents the present value, at the calculation date (time 0), of the expected aggregate change in the 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 CIA Committee on PPFRC to provide guidance for actuaries on the calculation of this 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

- Projected 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 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 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 Plan Provisions

This funding valuation was based on Plan design information provided by the MEP Board as of December 31, 2023. The following is a summary of the main provisions of the Plan.

Effective Date	
	Prior to 1994, the *Public Service Management Pension Plan Act* and its regulation provided for the payment of pension and related ancillary benefits to eligible participants of the Public Service Management Pension Plan (the "Old Plan"). In 1993, the *Public Sector Pension Plans Act* was passed, and came fully into force on January 1, 1994. On that date the Old Plan was split into the Public Service Management (Closed Membership) Pension Plan and the Management Employees Pension Plan. Eligible members of the Old Plan became members of the Management Employees Pension Plan, with retroactive effect from August 1, 1992.

Jurisdiction of Registration	
	Alberta

Eligibility for Membership	
	Open to full-time and part-time employees in designated management positions and certain grandfathered employees who meet the criteria specified in the Management Employees Pension Plan regulation.

Normal Retirement Benefit	
Eligibility	For service prior to January 1, 1992, age 55 with at least 5 years combined pensionable service. For service after December 31, 1991, age 60 with at least 5 years of combined pensionable service. In addition, on or after January 1, 2004, members with fewer than 5 years of combined pensionable service who were active participants at or after attaining age 65.

Benefit	Annual pension payable in equal monthly instalments calculated as pensionable service multiplied by 2.0% of highest average earnings (the participant's average annual salary in the five consecutive years of combined pensionable service in which such average is the highest).
Early Retirement	
Eligibility	Permitted for a member who has attained the age of 55 and accrued five years of combined pensionable service.
Benefit	For service prior to January 1, 1992, there is no reduction in the member's pension upon retirement. For service after December 31, 1991, a member's pension is reduced by 3% for each year that the early retirement age precedes the earlier of age 60 and the age at which 80 points would be reached, based on combined pensionable service to the date of termination. No reduction is applied if the member has accrued 80 points (that is, age plus combined pensionable service is greater than or equal to 80) or has attained age 60.
Postponed Retirement	
Eligibility	Any time after a vested member's normal retirement date but not later than December 31 of the year in which the member attains age 71. Members are vested with at least five years of combined pension service, or immediately if they are active participants at any point after attaining age 65.

Benefit	Normal retirement benefit accrued to postponed retirement date. The pre 1992 benefit is actuarially increased from the later of the termination date and age 55 to the postponed retirement date. The post 1991 benefit is actuarially increased from the later of the termination date and age 65 to the postponed retirement date.
Termination of Participation Prior to Pension Eligibility	
Pre-1992 service	
Eligibility	Members are vested following completion of five years of combined pensionable service.
Benefit	Members receive a refund of participant contributions with interest. Alternatively, vested members may opt to receive a deferred pension.
Post-1991 service	
Eligibility	Members are vested following completion of five years of combined pensionable service.
Benefit	Non-vested members receive a refund of participant contributions with interest. Vested Members are entitled to a deferred pension. In lieu of the deferred pension, a vested member may elect to transfer the commuted value of the deferred pension plus excess contributions to an acceptable registered retirement vehicle. In that event, the member must also take a refund of the participant's pre-1992 contributions, with interest, in lieu of the deferred pension earned for pre-1992 pensionable service. In addition, contributions made to acquire prior service are refunded in the form that they were made to the Plan.
Preretirement Death	
Pre-1992 service	
Eligibility	Members are vested following completion of five years of combined pensionable service.

Benefit	No pension partner or dependent children: Refund of participant contributions with interest. Dependent minor children but no pension partner: If the member was vested, or not vested but died in active service, a refund of two times the member's contributions, with interest. If the member was not vested and not in active service at the time of their death, a refund of the member's contributions, with interest. Pension partner: If the member was vested, the pension partner is eligible for an immediate unreduced pension determined as though the member had, immediately before death, terminated and retired with a total disability pension having elected a J&S 100% Guaranteed at Least 10 Years optional form pension. The pension partner further has the option to select an actuarially equivalent alternative form of pension. Alternatively, the pension partner may elect to receive a refund or transfer of two times the member's contributions, with interest. If the member was not vested and died in active service, the pension partner will receive a transfer or refund of two times the member's contributions, with interest. If the member was not vested and not in active service at the time of their death, the pension partner will receive refund or transfer of the member's contributions, with interest.
Post-1991 service	
Eligibility	Members are vested following completion of five years of combined pensionable service.

Benefit	The pension partner, and if no pension partner, the beneficiaries of non-vested members receive the participant's contributions with interest. If the member was vested at date of death, the pension partner will receive either 100% of commuted value or an immediate unreduced pension for life determined as though the member had, immediately before death, terminated and retired with a total disability pension having retired on the day before death and elected a J&S 100% Guaranteed at Least 10 Years optional form pension, plus excess contributions. If there is no surviving pension partner, the beneficiary will receive 100% of commuted value plus excess contributions.
Disability	
Eligibility	Qualification for benefits under employer-sponsored long-term disability plan or where the member is receiving temporary total or temporary partial disability benefits under the *Workers' Compensation Act*.
Benefit	Participation in the Plan continues, but no pension is payable concurrently with the LTD or WCB benefits. For the purpose of determining contributions and benefits, pensionable earnings will be the pensionable earnings immediately preceding disability, increased by subsequent general wage increases applicable for that member's employment class.

Contributions

In accordance with the Plan, contribution rates for service after December 31, 1991, will be set at a level appropriate for the funding of the Plan, as recommended by the Plan's actuary:

Valuation date: December 31, 1999
Effective date: January 1, 2000
Participants: 7.75% of pensionable earnings
Employers: 10.75% of pensionable earnings

Valuation date: December 31, 2001
Effective date: April 1, 2003
Participants: 9.5% of pensionable earnings
Employers: 13.1% of pensionable earnings

Valuation date: December 31, 2003
Effective date: July 1, 2005
Participants: 10.5% of pensionable earnings
Employers: 18.0% of pensionable earnings

Valuation date: December 31, 2009
Effective date: January 1, 2011
Participants: 11.16% of pensionable earnings
Employers: 19.14% of pensionable earnings

Valuation date: December 31, 2012
Effective date: January 1, 2014
Participants: 12.80% of pensionable earnings
Employers: 21.85% of pensionable earnings

Valuation date: December 31, 2015
Effective date: February 1, 2017
Participants: 12.80% of pensionable earnings
Employers: 17.20% of pensionable earnings

Valuation date: December 31, 2018
Effective date: January 1, 2020
Participants: 12.80% of pensionable earnings
Employers: 13.20% of pensionable earnings

Valuation date: December 31, 2021
Effective date: April 1, 2023
Participants: 12.00% of pensionable earnings
Employers: 12.00% of pensionable earnings

Maximum Benefit	
	Effective January 1, 1992, and only in respect of pensionable service after 1991, pensionable earnings for each calendar year are limited to 50 times the defined benefit annual maximum pension limit for the year under the Income Tax Act. For years after 2012, the limit is as follows:

Year	Limit
2013	134,834
2014	138,500
2015	140,945
2016	144,500
2017	145,722
2018	147,222
2019	151,278
2020	154,611
2021	162,278
2022	171,000
2023 +	Indexed to Average Industrial Wage

Normal Form of Payment	
Member without pension partner at retirement	For pre-1992 service, the normal form of pension is payable for life. For post-1991 service, the normal form of pension is a lifetime pension guaranteed for 120 months.
Member with pension partner at retirement	For pre-1992 service, the normal form of pension is a joint form with a 75% survivor pension payable to the pension partner. For post-1991 service, the normal form of pension is a joint form with a 2/3 survivor pension payable to the pension partner.

Cost-of-Living Increases	
	Cost-of-living increases based on 60% of the increase in the Alberta CPI apply to both deferred pensions and pensions-in-payment.

Definitions	
Pensionable earnings	The participant's actual salary limited to the amount in any year after 1992 which results in the maximum defined benefit for that year under the *Income Tax Act Regulations*.
Credited interest	Prior to 1994, participants' contributions were accumulated at the rate of 4% per annum, compounded semi-annually. After 1993, the rate of interest credited to participants' contributions was changed to the average yield of 5-year personal fixed term chartered bank deposits (CANSIM series V80691336) over the most recent 12-month period, calculated as of the first day of the calendar year.
CombinedCombined pensionable service	Combined pensionable service, as defined under the provisions of the Plan, cannot exceed 35 years. Combined pensionable service (service in the Plan plus pensionable service in the Public Service Pension Plan) is used to determine eligibility for benefits, vesting and determination of highest average salary.

A copy of the administrator certification certifying the accuracy and completeness of the Plan provisions is included in Appendix F of this report.

Appendix F: Administrator Certification

With respect to the Management Employees Pension Plan, forming part of the actuarial report as at December 31, 2023, I hereby certify that, to the best of my knowledge and belief:

- The asset data provided or made available to the actuary is complete and accurate; and
- The actuary has been notified of all relevant events subsequent to the valuation measurement date.

Name (print) of Authorized Signatory Alberta Treasury Board and Finance	Title
Mark Kleefeld Digitally signed by Mark Kleefeld Date: 2024.12.18 16:09:59 -07'00'	
Signature	Date

- The membership data and subsequent query answers provided or made available to the actuary are complete and accurate for all persons who are entitled to benefits under the terms of the Plan in respect of service up to the date of the valuation;
- The Plan provisions provided or made available to the actuary are complete and accurate; and
- The actuary has been notified of all relevant events subsequent to the valuation measurement date.

Kathryn Miller	Interim VP, Pensions Services
Name (print) of Authorized Signatory Alberta Pension Services Corporation	Title
	December 13, 2024
Signature	Date

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