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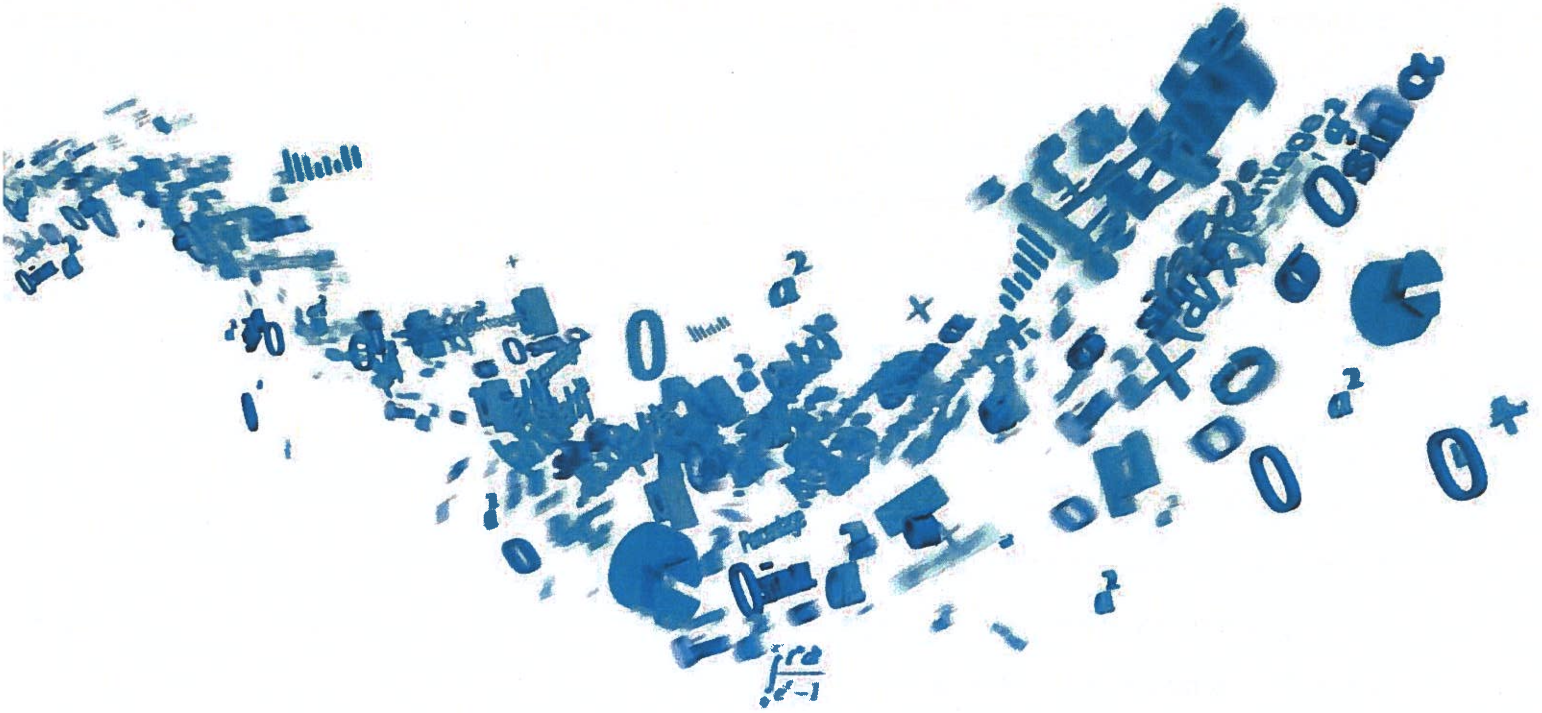

Actuarial Valuation as at January 1, 2022 Northern Employee Benefits Services Plan

Canada Revenue Agency Registration Number: 0401299

October 2022

Empower Results®

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Executive Summary

An actuarial valuation has been prepared for the Northern Employee Benefits Services Pension Plan (the "Plan") as at January 1, 2022 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. In accordance with the *Northern Employee Benefits Services Pension Plan Act*, the next actuarial valuation for the purposes of developing funding requirements should be performed no later than as at January 1, 2025.

Summary of Principal Results

Going Concern Financial Position

	January 1, 2022	January 1, 2021
Actuarial Value of Assets	$ 342,842,500	$ 301,044,000
Going Concern Liabilities	277,444,400	253,878,600
Going Concern Position	**$ 65,398,100**	**$ 47,165,400**
Funded Ratio	1.24	1.19

Hypothetical Wind-Up Financial Position

	January 1, 2022	January 1, 2021
Assets[1]	$ 380,224,700	$ 322,927,600
Liabilities	505,058,800	488,363,500
Hypothetical Wind-Up Position	**$ (124,834,100)**	**$ (165,435,900)**

[1]Net of estimated wind-up expenses.

Contribution Requirements

Considering the funding status of the Plan, the minimum company contributions recommended in this report with effect for the first plan year following January 1, 2022, and those recommended at January 1, 2021, are as follows:

	January 1, 2022		**January 1, 2021**	
	Cash Contribution Requirements	Contributions as a % of Valuation Compensation	Cash Contribution Requirements	Contributions as a % of Valuation Compensation
Total Current Service Cost	$ 21,532,000	14.6%	$ 21,163,300	14.6%
Administrative Expenses	1,664,000	1.1%	1,552,600	1.1%
Unfunded Liability Payments	0	0.0%	0	0.0%
Total Required Contributions	**$ 23,196,000**	**15.7%**	**$ 22,715,900**	**15.7%**

- Current contributions are sufficient to meet the contribution requirements on a going concern basis including any going concern special payments.
- The *Northern Employee Benefits Services Pension Plan Act* was passed by both the Northwest Territories Legislative Assembly and the Nunavut Legislative Assembly and came into effect October 1, 2015. These Acts do not require the Plan to be funded on a solvency basis.
- The Plan requires employees and employers to each contribute 8% of payroll annually. This combined 16% contribution rate is sufficient to meet the current contribution requirements of 15.7% in 2022, leaving 0.3% of payroll or $454,000 as a provision for adverse deviation.

Key Assumptions

The principal assumptions to which the valuation results are most sensitive are outlined below:

Going Concern Assumptions:

	January 1, 2022	January 1, 2021
Discount rate (net of margin)	5.90%	Same
Inflation rate	2.00%	Same
Pensionable earnings	2.50%	Same
Mortality table	300% of the 2014 Canadian Public Sector Pensioners' Mortality Table combined with mortality improvement scale CPM-B (sex-distinct)	Same
Retirement rates	15% between age 50 and 59; 20% at ages 60 and 61; 15% between ages 62 and 64; 40% at age 65; 30% between ages 66 and 69; 50% at age 70; If over 70, 100%.	Same
Withdrawal rates	See Table A	Same

Hypothetical Wind-Up Assumptions:

	January 1, 2022	January 1, 2021
Discount rate	Annuity purchases: Non Indexed: 2.86% Indexed: -0.54%	Annuity purchases: Non Indexed: 2.54% Indexed: -0.81%
	Non Indexed Transfers: 2.10% for 10 years, 3.10% thereafter Indexed Transfers: 0.70% for 10 years, 1.00% thereafter	Non Indexed Transfers: 1.20% for 10 years, 2.80% thereafter Indexed Transfers: 0.60% for 10 years, 0.80% thereafter
Mortality table	2014 Canadian Pensioners' Mortality Table combined with mortality improvement scale CPM-B (sex-distinct)	Same
Retirement rates	If age 50 or older and 5 years of service, most valuable retirement age If less than age 50 or less than 5 years of service – deferred to age 65	Same

Section 1: Introduction

Purpose and Terms of Engagement

We have been engaged by Northern Employee Benefits Services, and hereafter referred to as the "Company", to conduct an actuarial valuation of the Plan as at January 1, 2022 for the general purpose of determining the minimum and maximum funding contributions 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 January 1, 2022;
- Determine the financial position of the Plan as at January 1, 2022 on a hypothetical wind-up basis;
- Determine the funding requirements and verifying the sufficiency of contributions to the Plan as at January 1, 2022; and
- Provide the necessary actuarial certification required under the *Northern Employee Benefits Services Pension Plan 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.

In accordance with the *Northern Employee Benefits Services Pension Plan Act*, the next actuarial valuation for the purposes of developing funding requirements should be performed no later than as at January 1, 2025.

Company 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 January 1, 2021;
- Membership data compiled as at January 1, 2022 by the Company;
- Asset data taken from the Plan's unaudited financial statements; and
- A copy of the latest plan text and amendments up to and including January 1, 2022.

Furthermore, our actuarial assumptions and methods have been chosen to reflect our understanding of the Company'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 January 1, 2022 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 Company, 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 January 1, 2022 is shown in the following table. The results as at January 1, 2021 are also shown for comparison purposes.

Going Concern Financial Position

	January 1, 2022	January 1, 2021
Actuarial Value of Assets	**$ 342,842,500**	**$ 301,044,000**
Going Concern Liabilities		
▪ Active and Leave members	$ 163,903,400	$ 152,637,500
▪ Disabled members	1,012,600	1,328,700
▪ Deferred vested members	43,367,300	39,555,400
▪ Retired members and beneficiaries	69,161,100	60,357,000
Total Liabilities	**$ 277,444,400**	**$ 253,878,600**
Excess/(Unfunded Liability)	**$ 65,398,100**	**$ 47,165,400**

On the basis of the plan provisions, membership data, going concern assumptions and methods and asset information described in the Appendices, the going concern normal cost of the Plan as at January 1, 2022 is shown in the following table. The normal cost as at January 1, 2021 is also shown for comparison purposes.

Going Concern Normal Cost

	January 1, 2022	January 1, 2021
Normal Cost		
Total normal cost	$ 21,532,000	$ 21,163,300
Required member contributions	(11,825,100)	(11,558,500)
Provision for non-investment expenses	1,664,000	1,552,600
Company Normal Cost	**$ 11,370,900**	**$ 11,157,400**
Total pensionable earnings (in year following valuation date)	$ 147,814,300	$ 144,481,100
Company Normal Cost		
As a % of total pensionable earnings	7.7%	7.7%

Change in Financial Position

During the period from January 1, 2021 to January 1, 2022, the going concern financial position of the Plan changed from a surplus of $47,165,400 to a surplus of $65,398,100. The major components of this change are summarized in the following table.

Reconciliation of the Going Concern Financial Position
For the Period from January 1, 2021 to January 1, 2022

Excess/(Unfunded Liability) as at January 1, 2021	$ 47,165,400
Interest on excess/(unfunded liability)	2,924,300
Expected Excess/(Unfunded Liability) as at January 1, 2022	**$ 50,089,700**
Change in liabilities due to experience gains/(losses)	
Gain/(loss) from investment earnings greater than expected	14,517,300
Gain/(loss) due to contributions experience	3,516,000
Gain/(loss) due to retirement experience	581,400
Gain/(loss) due to salary/YMPE increases greater than expected	(327,200)
Gain/(loss) due to termination experience	(2,689,200)
Gain/(loss) due to mortality experience	670,300
Gain/(loss) due to indexation increases different than expected	(1,316,600)
Gain/(loss) due to change in margin	(218,600)
Gain/(loss) due to expense experience	166,600
Net gain due to other experience and miscellaneous items	408,400
Excess/(Unfunded Liability) as at January 1, 2022	**$ 65,398,100**

Going Concern Valuation Sensitivity Results

In accordance with the Canadian Institute of Actuaries 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 than that used for the going concern valuation.

	Valuation Basis January 1, 2022	Based on Rate of 1% Lower	Effect $	Effect %
Going concern liabilities	$ 277,444,400	$ 326,024,200	$ 48,579,800	17.5%
Total Normal cost	$ 21,532,000	$ 27,460,600	$ 5,928,600	27.5%

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.

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. In order to calculate the impact on the Actuarial Value of Assets, the decrease in interest rates only impacts fixed income assets (35.9% of total assets) and a duration of 13.7 was considered.

	Base Scenario	Adverse Scenario	Impact ($)
Actuarial value of assets	$ 342,842,500	$ 347,540,700	$ 4,698,200
Going concern liabilities	277,444,400	326,024,200	48,579,800
Excess Assets/(Unfunded Liability)	**$ 65,398,100**	**$ 21,516,500**	**$ (43,881,600)**

Deterioration in Asset Value

In assessing the risk related to the deterioration in asset value we have chosen an adverse scenario equal to a 20% 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 20% reduction in non-fixed income asset values.

	Base Scenario	Adverse Scenario	Impact ($)
Actuarial value of assets	$ 342,842,500	$ 330,845,000	$ (11,997,500)
Going concern liabilities	277,444,400	277,444,400	-
Excess Assets/(Unfunded Liability)	**$ 65,398,100**	**$ 53,400,600**	**$ (11,997,500)**

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 the 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	$ 342,842,500	$ 342,842,500	$ -
Going concern liabilities	277,444,400	282,890,400	5,446,000
Excess Assets/(Unfunded Liability)	**$ 65,398,100**	**$ 59,952,100**	**$ (5,446,000)**

Section 3: Hypothetical Wind-Up Valuation Results

Hypothetical Wind-up Financial Position of the Plan

A hypothetical wind-up valuation is performed to determine the financial position of the Plan as at the valuation date on a wind-up basis, reflecting market settlement rates as of the valuation date. The hypothetical wind-up valuation is determined using benefit entitlements on the assumption that the Plan has neither an excess nor a deficit. There are no additional benefits granted from the Plan in the event of a Plan wind-up. Assets are set equal to the adjusted market value net of estimated wind-up expenses. All assumptions for the hypothetical wind-up valuation are listed in Appendix E of the report.

On the basis of plan provisions, membership data, hypothetical wind-up assumptions and methods, and asset information described in the Appendices, as well as the requirements of the *Northern Employee Benefits Services Pension Plan Act*, the hypothetical wind-up financial position of the Plan as at January 1, 2022 is shown in the following table. The hypothetical wind-up financial position of the Plan as at January 1, 2021 is shown for comparison purposes.

Hypothetical Wind-Up Financial Position

	January 1, 2022	January 1, 2021
Assets		
Adjusted market value of assets	$ 380,724,700	$ 323,427,600
Estimated wind-up expenses	(500,000)	(500,000)
Hypothetical Wind-Up Assets	**$ 380,224,700**	**$ 322,927,600**
Hypothetical Wind-Up Liabilities		
Active and Leave members	$ 299,568,400	$ 295,631,900
Disabled members	1,704,500	2,331,300
Deferred vested members	87,821,500	80,816,500
Retired members and beneficiaries	115,964,400	109,583,800
Total Liabilities	**$ 505,058,800**	**$ 488,363,500**
Hypothetical Wind-Up Position	**$ (124,834,100)**	**$ (165,435,900)**

The value of the consent benefits related to indexing of benefits in respect of credited service after 2004 which is not included in the Hypothetical Wind-Up Liability is $230,894,800 as at January 1, 2022 and $207,572,700 as at January 1, 2021.

Consent benefits for Actives, Deferred Vested and Pensioners & Beneficiaries represent 23.5%, 3.7% and 4.2% of Hypothetical Wind-Up Liabilities (including consent benefits) respectively at January 1, 2022.

Hypothetical Wind-Up Valuation Sensitivity Results

In accordance with the Canadian Institute of Actuaries Standards of Practice specific to pension plans, the table below presents the sensitivity of the hypothetical wind-up liabilities to using a discount rate of 1% lower than that used for the hypothetical wind-up valuation.

	Valuation Basis January 1, 2022	Based on Rate of 1% Lower	Effect $	Effect %
Hypothetical Wind-up liabilities, excluding Consent Benefit	$ 505,058,800	$ 601,374,700	$ 96,315,900	19.07%
Hypothetical Wind-up liabilities, including Consent Benefit	$ 735,953,500	$ 912,410,100	$ 176,456,600	23.98%

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

Incremental Cost on a Hypothetical Wind-Up Basis

The incremental cost on a hypothetical wind-up basis represents the present value at January 1, 2022 of the expected aggregate change in the hypothetical wind-up liabilities between January 1, 2022 and the next calculation date that is January 1, 2023. Appendix E gives more details on the calculation methodology and on assumptions.

Based on this methodology and on these assumptions, the incremental cost on a hypothetical wind-up basis, excluding Consent Benefit, for the period from January 1, 2022 to January 1, 2023, is $16,531,800. The incremental cost on a hypothetical wind-up basis, including Consent Benefit, for the period from January 1, 2022 to January 1, 2023, is $25,382,800.

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;
- An estimate of the normal cost for the year following the valuation date; and
- The portion of the going concern normal cost that is to be paid by the members.

		2022
Normal Cost		
Total normal cost	$	21,532,000
Required member contributions		(11,825,100)
Provision for non-investment expenses		1,664,000
Company Normal Cost	**$**	**11,370,900**
Total pensionable earnings (in year following valuation date)	$	147,814,300
Company Normal Cost		
As a % of total pensionable earnings		7.7%

Development of Special Payments

As the Plan has a going concern surplus, no amortization payments are required to be contributed.

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 excess (if any) that exceeds 25% of the going concern liabilities.

Since the going concern surplus is not more 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.

Development of Minimum Required Company Contribution

The table below presents the development of the minimum required company contribution, according to the Plan's funding policy, for the plan year commencing January 1, 2022.

	Cash Contribution Requirements in 2022	Contributions in 2022 as a % of Valuation Compensation
Total Current Service Cost	$ 21,532,000	14.6%
Administrative Expenses	1,664,000	1.1%
Unfunded Liability Payments	0	0.0%
Total Required Contributions	**$ 23,196,000**	**15.7%**

- Current contributions are sufficient to meet the contribution requirements on a going concern basis including going concern special payments.
- The *Northern Employee Benefits Services Pension Plan Act* was passed by both the Northwest Territories Legislative Assembly and the Nunavut Legislative Assembly and came into effect October 1, 2015. These Acts do not require the Plan to be funded on a solvency basis.
- The Plan requires employees and employers to each contribute 8% of payroll annually. This combined 16% contribution rate is sufficient to meet the current contribution requirements of 15.7% in 2022, leaving 0.3% of payroll or $454,000 as a provision for adverse deviation.

Development of Maximum Deductible Company Contribution

The table below presents the development of the maximum deductible company contribution for each of the plan years covered by this report.

The maximum deductible company contribution presented in the table below for a given plan year is calculated assuming that the Company makes the maximum deductible company contribution in the first plan year covered by this report.

Plan Year:		**2022**
Company normal cost	$	11,370,900
Greater of Unfunded Accrued Liability and an Unfunded Hypothetical Wind-up Liability		355,728,800
Required application of excess surplus		0
Maximum Deductible Company Contribution	**$**	**367,099,700**

If the Company wishes to make the maximum deductible company contribution, it is advisable to contact the Plan actuary before making such contribution to ensure that the contribution will be permissible and deductible and that any regulatory requirements are considered.

Section 5: Actuarial Certificate

Actuarial Opinion, Recommendations and Certification for the Northern Employee Benefits Services Pension Plan

Canada Revenue Agency Registration Number: 0401299

Opinion

This actuarial certification forms an integral part of the actuarial valuation report for the Plan as at January 1, 2022. I confirm that I have prepared an actuarial valuation of the Plan as at January 1, 2022 for the purposes outlined in the Introduction section to this report and consequently:

My advice on funding is the following:

- The Company should contribute the amounts outlined in Section 4 of this report. The funding policy adopted by the Company requires going concern deficiencies to be amortized over a period of 15 years from the date the unfunded liability was established.
- In accordance with the Northern Employee Benefits Services Pension Plan Act, the next actuarial valuation for the purposes of developing funding requirements should be performed no later than as at January 1, 2025.

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 company contribution range outlined in this report qualifies as eligible contributions under Section 147.2(2) of the *Income Tax Act.*
- The pre-1990 maximum pension restrictions in Subsection 8504(6) of the Regulations to the *Income Tax Act* do not apply to any members of the Plan
- 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.

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October 2022

Appendix A: Glossary of Terms

- The **actuarial value of assets** is the asset value used for going concern valuation purposes. Smoothing methods are sometimes used to smooth investment gains and losses over a certain period.
- The **estimated wind-up expenses** is an estimate of the administrative and other expenses expected to be charged against the pension fund if the Plan were to terminate on the valuation date.
- The **funded ratio** compares the actuarial value of assets to the going concern liabilities.
- The **going concern liabilities** are the actuarial present value of benefits earned in respect of service prior to the valuation date. The going concern liabilities are calculated using the going concern assumptions and methods summarized in Appendix D of this report.
- The **going concern position** is the difference between the actuarial value of assets and the going concern liabilities.
- The **hypothetical wind-up assets** are the market value of pension fund assets adjusted to reflect contributions, benefit payments, transfers and fees/expenses in transit at the valuation date, less estimated wind-up expenses.
- The **hypothetical wind-up liabilities** are the actuarial present value of benefits earned in respect of service prior to the valuation date determined as if the Plan were voluntarily wound up on the valuation date. The hypothetical wind-up liabilities are determined using benefit entitlements on the assumption that the Plan has neither an excess nor a deficit. The hypothetical wind-up liabilities are calculated using the hypothetical wind-up valuation assumptions summarized in Appendix E of this report.
- The **maximum deductible company contribution** refers to an eligible contribution pursuant to Section 147.2(2) of the *Income Tax Act*. Under Subsection 8502(b) of the Regulations to the *Income Tax Act*, each Company contribution made after 1991 in respect of a defined benefit provision of a registered pension plan must be such eligible contribution.
- In a company's fiscal year, the following contributions are eligible under Section 147.2 of the *Income Tax Act*.
    - The company normal cost, eligible under Section 147.2(2) subject to certification by the actuary and approval by the Canada Revenue Agency; plus
    - Special payments eligible under Section 147.2(2) up to the amount of the unfunded liability or the hypothetical wind-up deficiency, whichever is greater, subject to certification by the actuary and approval by the Canada Revenue Agency; less
    - Required application of excess surplus.
- The company normal cost and special payments for this Plan will be deductible under Section 147.2(2) of the *Income Tax Act*, subject to the approval of the Canada Revenue Agency.
- In order to be deductible in a given fiscal year, company contributions must be made not later than 120 days after the end of the fiscal year.
- The **minimum required company** contribution for each plan year is equal to:
    - The company normal cost; plus
    - Special payments toward amortizing any unfunded liability over 15 years from the date on which the unfunded liability was established; plus

  - Required application of excess surplus; less
  - Permitted application of excess.
- In order to satisfy the requirements of the *Northern Employee Benefits Services Pension Plan Act* and its Regulations, contributions to the fund must be made in accordance with the following rules:
  - Required member contributions (if any) must be remitted to the pension fund within 30 days following the month in which the contributions were received from the member or deducted from his or her remuneration.
  - Company normal cost contributions and special payments must be remitted to the pension fund within 30 days after the end of the month for which the contributions are payable.
- The **special payments** are payments required to liquidate the unfunded going concern liability:
  - The going concern special payments are payments required to liquidate the unfunded liability, with interest at the going concern valuation discount rate, by equal monthly instalments over a period of 15 years beginning on the valuation date of the report in which the going concern unfunded liability was determined.
- The **excess/(unfunded liability)** is the difference between the actuarial value of assets and the sum of the going concern liabilities and the prior year credit balance.
- The **total normal cost** is the actuarial present value of benefits expected to be earned in respect of service for each year starting on the valuation date. Required member contributions (if any) are deducted from the total normal cost to determine the company normal cost. The total normal cost is calculated using the going concern valuation assumptions and methods summarized in Appendix D of this report.

Appendix B: Assets

Asset Data

The Plan assets are held by RBC Investor Services and invested by Connor, Clark and Lunn Investment Management and Bentall Kennedy. The valuation of assets was based on unaudited financial statements of the pension fund provided by RBC Investor Services as of December 31, 2021.

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.

Market Value of Assets

The following is a summary of the composition of the Plan's assets by asset type as reported by RBC Investor Services as at January 1, 2022. For comparison purposes, the composition at the previous valuation date of January 1, 2021 is also shown.

	January 1, 2022		January 1, 2021	
	$	**%**	**$**	**%**
Cash and short term	$ 4,582,983	1.2%	$ 3,743,418	1.1%
Fixed-income	107,863,171	28.3%	83,983,487	26.0%
Canadian equities	100,288,521	26.3%	88,435,471	27.3%
Foreign equities	139,659,239	36.6%	122,315,525	37.8%
Real Estate	28,820,425	7.6%	25,088,196	7.8%
Total Invested Assets	**$381,214,339**	**100.0%**	**$323,566,097**	**100.0%**

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
Short term	0.0%	0.0%	10.0%
Canadian bonds	20.0%	30.0%	40.0%
Canadian equities	17.5%	25.0%	32.5%
Foreign equities	27.5%	35.0%	42.5%
Real estate	5.0%	10.0%	15.0%
		100.0%	

Reconciliation of Changes in Market Value of Assets

The table below reconciles changes in the market value of assets between January 1, 2021 and January 1, 2022.

	2021
Market Value of Assets, Beginning of Plan Year	$ 323,566,100
Contributions During Plan Year	
Member normal contributions	$ 13,182,500
Company normal cost contributions	13,182,500
Member voluntary contributions	603,100
Other Contributions	1,601,300
Total	**$ 28,569,400**
Benefit Payments During Plan Year	
Non-retired members[1]	$ (12,253,200)
Retired members	(6,165,700)
Total	**$ (18,418,900)**
Fees/Expenses	
Custodial fees	$ (68,100)
Investment Management fees	(877,300)
Actuarial Consulting fees	(240,000)
Legal Consulting fees	(175,600)
Administrative fees	(996,700)
Total	**$ (2,357,700)**
Investment Income	$ 49,855,400
Market Value of Assets, End of Plan Year	**$ 381,214,300**
Rate of return	15.22%
Rate of return, net of Investment Management fees	14.94%

[1] Includes members who have terminated employment or died.

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 four-year period.

The development of the actuarial value of assets as of January 1, 2022 is shown below:

Year Ending	Original Amount of (Gain) Loss	(Gain) Loss Admitted in Prior Years	(Gain) Loss Admitted in Current Year	(Gain) Loss to be Admitted in Future Years
December 31, 2019	$ (25,598,200)	$ (12,799,100)	$ (6,399,500)	$ (6,399,600)
December 31, 2020	$ (18,630,800)	$ (4,657,700)	(4,657,700)	(9,315,400)
December 31, 2021	$ (29,556,300)	$ 0	(7,389,100)	(22,167,200)
			$ (18,446,300)	**$ (37,882,200)**

Adjusted market value of assets, January 1, 2022	**343,332,100**
Receivables In-Transit	34,100
Payables In Transit	(523,700)
Actuarial value of assets, January 1, 2022	**$ 342,842,500**

The history of actuarial value of assets and rate of return on actuarial value of assets over the past last three years are as follows:

	2019	2020	2021
Rate of return – Actuarial value	7.88%	9.57%	10.97%
Actuarial value of assets	$ 262,054,700	$ 301,044,000	$ 342,842,500

Appendix C: Membership Data

Source of Data

This funding valuation was based on member data provided by the Company as of January 1, 2022. 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. These tests were 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 at 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 1 year of credited service from January 1, 2021. These tests also revealed any members who accrued less than 1 year of credited service from January 1, 2021;
- A reconciliation of pensionable earnings against the corresponding amounts provided for the last valuation to identify any unusual increases or decreases;
- A reconciliation of any stated benefit payments in 2021 (for retired, terminated or deceased employees) against the financial statements of the pension fund for confirmation of the payments;
- A reconciliation of inactive member benefit amounts against the corresponding amounts provided for the last valuation, to ensure consistency of data.

There was no information missing from the data, so no assumptions were required with respect to such data.

A copy of the administrator certification certifying the accuracy and completeness of the member data is included at the end of this report.

Membership Summary

The table below reconciles the number of members as of January 1, 2022 with the number of members as of January 1, 2021 and the changes due to experience in the period.

	Active	Disabled	Leave	Deferred	Pensioners	Total
Members, January 1, 2021	1,980	13	42	949	550	3,534
Changes due to:						
New entrants	393					393
Death						
No further benefits				(9)	(22)	(31)
Pending					(1)	(1)
Immediate pension				2	7	9
Return to active from deferred	1			(1)		
Return to active from disability	3	(3)				
Return from leave of absence	26		(26)			
Disability	(8)	8				
Leave of absence	(46)		46			
Retirement	(27)	(1)		(15)	43	
Termination						
Deferred pension	(164)	(5)	(4)	174	(1)	
Lump sum	(53)	(1)	(2)	(38)		(94)
Non-vested	(114)		(4)	(32)		(150)
Data correction	(8)			5	(2)	(5)
Net change	3	(2)	10	86	24	121
Members, January 1, 2022	**1,983**	**11**	**52**	**1,035**	**574**	**3,655**

Membership Summary

Active Members

	January 1, 2022	January 1, 2021
Number	1,983	1,980
Average age	44.7	44.5
Average credited service	5.8	5.6
Average valuation compensation	$ 86,486	$ 84,624
Proportion of female	45.4%	45.1%

Disabled Members

	January 1, 2022	January 1, 2021
Number	11	13
Average age	53.9	54.2
Average credited service	6.6	6.3
Average valuation compensation	$ 98,535	$ 90,162
Proportion of female	45.5%	34.7%

Leave of Absence

	January 1, 2022	January 1, 2021
Number	52	42
Average age	38.2	38.3
Average credited service	4.6	4.2
Average valuation compensation	$ 84,663	$ 76,983
Proportion of female	75.0%	85.5%

Deferred Vested Members

	January 1, 2022	January 1, 2021
Number	1,035	949
Average age	51.3	50.9
Average Annual Indexed Pension	$ 5,627	$ 5,387
Number of Members with Indexed Pensions	710	625
Average Annual Non-Indexed Pension	$ 2,465	$ 2,393
Number of Members with Non-Indexed Pensions	147	131
Average Annual Indexed Temporary Pension	$ 4,059	$ 4,277
Number of Members with Indexed Temporary Pensions	78	62
Average Pending Lump Sum Payment	$ 4,895	$ 20,913
Number of Members with Pending Lump Sum	178	193

Retired Members

	January 1, 2022	January 1, 2021
Number	458	431
Average age	70.2	70.0
Average Annual Indexed Pension	$12,906	$11,943
Number of Members with Indexed Pensions	411	384
Average Annual Non-Indexed Pension	$3,856	$3,869
Number of Members with Non-Indexed Pensions	47	47
Average Annual Indexed Temporary Pension	$5,761	$5,339
Number of Members with Temporary Pensions	90	84

Survivors[1]

	January 1, 2022	January 1, 2021
Number	107	108
Average age	67.6	66.9
Average Annual Indexed Pension	$5,177	$5,371
Number of Members with Indexed Pensions	94	85
Average Annual Non-Indexed Pension	$1,779	$1,765
Number of Members with Non-Indexed Pensions	13	23

[1] Excludes surviving children receiving annuity certain payments

Distribution of Active, Disabled, and Leave of Absence Members by Age and Service

The following table provides a detailed summary of the active, disabled, and leave of absence membership at the valuation date by years of credited service and by age group. Some of the earnings information is being withheld for confidentiality.

Age		< 5	5–10	10–15	15–20	20–25	25–30	30–35	Total
<25	Count	50							50
	Average Pension Earnings	$ 60,906							$ 60,906
25–29	Count	163	8						171
	Average Pension Earnings	$ 73,473	$ 83,845						$ 73,958
30–34	Count	188	49	5					242
	Average Pension Earnings	$ 78,610	$ 93,330	$ 79,846					$ 81,616
35–39	Count	186	69	20	4				279
	Average Pension Earnings	$ 78,740	$ 92,593	$112,498	$ 71,852				$ 84,488
40–44	Count	166	88	34	5				293
	Average Pension Earnings	$ 82,722	$ 96,466	$110,443	$ 86,780				$ 90,136
45–49	Count	114	73	51	13	4			255
	Average Pension Earnings	$ 87,783	$ 97,598	$ 94,114	$87,792	$ 86,830			$ 91,845
50–54	Count	115	91	52	26	7	5		296
	Average Pension Earnings	$ 83,062	$ 91,050	$ 88,980	$ 81,402	$ 98,182	$ 82,922		$ 86,767
55–59	Count	106	50	44	13	13	7	5	238
	Average Pension Earnings	$ 91,473	$ 90,415	$ 84,944	$ 93,376	$ 95,782	$ 72,130	$115,906	$ 90,328
60–65	Count	65	54	30	14	6	5	6	180
	Average Pension Earnings	$ 87,516	$ 97,045	$ 97,452	$ 82,148	$ 91,017	$92,284	$ 88,242	$ 91,887
>65	Count	14	10	11	6			1	42
	Average Pension Earnings	$107,515	$109,984	$103,227	$99,482			$ 84,822	$105,292
Total	Count	1,167	492	247	81	30	17	12	2,046
	Average Pension Earnings	$ 81,086	$ 94,295	$ 95,659	$ 85,678	$ 94,195	$ 81,232	$ 99,484	$ 86,505

Retired Membership Distribution

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

Age Group	Pension Form	Number	Average Monthly Pension		Average Monthly Pension to Spouse		Average Remaining Years Payable (Years)	Average Remaining Guarantee Period (Years)
			Indexed	Non-Indexed	Indexed	Non-Indexed		
35-39	Life only	1	$331					0.0
45-49	Guaranteed	2	$496					2.4
50-54	Bridge	2	$415		$93		12.1	3.4
	Guaranteed	4	$463					4.3
	Joint	2	$170		$113			2.6
	Life only	7	$273	$124				0.0
55-59	Bridge	24	$462		$222		7.7	2.5
	Guaranteed	11	$809					2.4
	Joint	18	$1,282		$810			2.6
	Life only	8	$317	$64				0.0
60-64	Bridge	57	$499		$264		2.8	2.0
	Guaranteed	16	$1,118	$54				3.5
	Joint	50	$1,383		$880			2.1
	Life only	14	$456	$207				0.0
65-69	Bridge	7	$409		$149		0.3	0.5
	Guaranteed	24	$940	$225				3.2
	Joint	80	$1,210	$342	$744	$217		1.6
	Life only	30	$778	$159				0.0
70-74	Certain	1	$263					0.7
	Guaranteed	15	$916	$558				2.0
	Joint	97	$958	$346	$619	$210		0.3
	Life only	43	$747	$309				0.0
75-80	Guaranteed	3	$1,492					0.9
	Joint	60	$945	$436	$608	$291		0.0
	Life only	27	$914	$210				0.0
>80	Joint	24	$673	$337	$423	$219		0.0
	Life only	28	$475	$148				0.0
Total		655	$884	$284	$387	$107	0.6	1.1

Appendix D: 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.

Assumptions and Methods

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

	January 1, 2022	January 1, 2021
Economic Assumptions		
Discount rate (net of margin for adverse deviation)	5.90% (net of investment expenses)	Same
Inflation rate	2.00%	Same
Increases in pensionable earnings (excludes disabled members)	2.50%	Same
Increases in year's maximum pensionable earnings ("YMPE")	2.50%	Same
Increases in maximum pension limit	In accordance with *Income Tax Act*, then 2.50%	Same
Discount rate used for terminated members electing a lump sum	3.50% for 10 years; 4.00% thereafter	Same
Investment expenses	0.36% (taken into account in the discount rate assumption)	Same
Non-investment expenses	$1,664,000 (not taken into account in the discount rate assumption)	$1,552,600 (not taken into account in the discount rate assumption)
Margin for adverse deviation	Margin of 5.33% of liabilities is included in the discount rate	Margin of 3.52% of liabilities is included in the discount rate
Demographic Assumptions		
Mortality		
Pre-Retirement	120% of the 2014 Canadian Public Sector Pensioners' Mortality Table combined with mortality improvement scale CPM-B (sex-distinct)	Same
Post-Retirement	300% of the 2014 Canadian Public Sector Pensioners' Mortality Table combined with mortality improvement scale CPM-B (sex-distinct)	Same

	January 1, 2022	January 1, 2021
Post-Termination (deferred pension)	300% of the 2014 Canadian Public Sector Pensioners' Mortality Table combined with mortality improvement scale CPM-B (sex-distinct)	Same
Post-Termination (CV)	2014 Canadian Pensioners' Mortality Table combined with mortality improvement scale CPM-B (sex-distinct)	Same
Termination of employment		
Active & Leave Members	Table A following	Same
Disabled Members	Nil	Same
Disability	None	None
Retirement		
Active & Leave Members	15% between age 50 and 59; 20% at ages 60 and 61; 15% between age 62 and 64; 40% at age 65; 30% between age 66 and 69; 50% at age 70; If over 70, 100%	Same
Deferred Vested Members	Age 60 if age 50 or more at termination and had five years of Credited Service; otherwise age 65	Same
Disabled Members		
Disabled Prior to 2004	Age 65	Same
Disabled after 2004	2 years after date of disability	Same
Proportion of vested terminated members electing a lump sum	60%	Same
Proportion married		
Non-retired proportion with spouse	80%	Same
Non-retired spousal age differential	Males four years older	Same

	January 1, 2022	January 1, 2021
Methods		
Actuarial cost method	Projected accrued benefit	Same
Asset valuation method	Market value of assets adjusted to reflect contributions and benefit payments in transit as of the valuation date. Adjusted to reflect asset gains (losses) over a four-year period	Same

Table A - Termination Rates from 2021 Experience Study

Withdrawal Rates per 1,000 Members

Present Age	Service 0 years	1 year	2 years	3 years	4 years	5 years	6+ years
20 to 24	250	250	250	250	250	250	200
25 to 29	250	250	250	250	250	250	200
30 to 34	250	250	200	200	200	200	100
35 to 39	250	250	150	150	150	150	100
40 to 44	250	250	100	100	100	100	100
45 to 49	250	250	100	100	100	100	100
50 & over	0	0	0	0	0	0	0

Justification of Actuarial Assumptions and Methods

Economic Assumptions

Discount Rate

We have used a discount rate of 5.90%.

The overall expected return ("best-estimate") is 6.35%, which is based on an inflation rate of 2.00%, yielding a real rate of return on the pension fund assets of 4.35%. 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. A separate allowance is made for plan expenses that are paid from the Plan.

In order to set the discount rate, we have incorporated the following adjustments to the overall expected rate of return:

Development of Discount Rate	
Overall expected return	6.35%
Investment expenses	(0.36)%
Additional returns due to active management	0.26%
Margin for adverse deviations	(0.35)%
Discount Rate	**5.90%**

Therefore, we have arrived at a discount rate of 5.90%.

Inflation Rate

The inflation rate is assumed to be 2.00% per year. This reflects our best estimate of future inflation considering current economic and financial market conditions.

Discount Rate and Inflation Rate for Vested Terminated Members Electing a Lump Sum

As it is assumed that a portion of vested terminated members will elect a lump sum settlement in lieu of a deferred pension, an assumption regarding the rate that will be used to determine the value of the lump sum amount is necessary. The discount rate has been assumed to be 3.50% for the first 10 years and 4.00% thereafter, and the inflation rate has been assumed to be 2.00%, both of which are representative of the assumptions used to determine such lump sum settlements and seen to be best estimate.

Increases in Pensionable Earnings

We have assumed future salary increases will be 2.50%. The long term assumption reflects an assumed rate of inflation of 2.00% per year plus an allowance of 0.50% per year for the effect of productivity growth. It does not include a provision for merit and promotion. The assumption for future salary increases reflects current economic conditions and long term negotiated contractual increases.

Increases in Year's Maximum Pensionable Earnings

As the benefits paid to a member from the 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 2.50% per year. This is comprised of an annual increase of 2.00% on account of inflation, plus 0.50% on account of productivity, which is consistent with historical real economic growth.

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 $3,420.00 in 2022. It is assumed that the maximum limit will increase at 2.50% per year commencing in 2023. This is comprised of an annual increase of 2.00% on account of inflation, plus 0.50% on account of productivity.

Expenses

Explicit provision has been made as an addition to the normal actuarial cost for non-investment expenses expected to be paid from the pension fund. The assumed level is based on the level of expenses in 2021 and the administrator's expense budget for 2022.

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 Plan sponsors.

A margin for adverse deviations of 5.33% of liabilities has been reflected in the interest rate assumption.

The actuary has discussed the Plan's experience with the Company 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 Company's desire to maintain safety cushions.

Demographic Assumptions

Mortality

During 2014, the CIA completed a study of Canadian pensioner mortality levels and trends. The 2014 study published mortality rates split by sector and included Public, Private and Combined tables, as well as possible pension size adjustment factors. A generational projection scale, CPM-B, was also developed to allow for improvements in mortality after 2014.

The analysis undertaken during the last filed valuation continues to hold. Therefore, the continued use of this mortality table and projection scale are considered reasonable. However, to reflect the higher mortality experienced by northern employees and supported by the results of the experience study performed in 2015, an adjustment has been made to the mortality table by increasing the post-retirement mortality rates by 200% and the pre-retirement mortality rates by 20%.

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 continued use of the CPM-B mortality table and CPM-B projection scale are considered reasonable.

Retirement

A table of retirement rates has been used based on previous plan experience. This scale was developed as part of the experience study performed in 2021.

Deferred vested member retirement age is the age at which the benefit payable would be unreduced, thus limiting the gains or losses.

Disabled member retirement age is assumed to be 65 for members who become disabled prior to 2004; since they continue to accrue service, there would be no incentive to retire earlier. For members who become disabled on or after 2004, they can only receive two additional years of service, and then retire.

Termination of Employment

A table of select and ultimate termination rates has been used that is based on plan experience. This scale was developed as part of the experience study performed in 2021. The termination rates are considered to be best estimate.

Option Elections on Termination

Given the additional cost to the Plan at the present time of a member electing a lump sum transfer, an assumption regarding the proportion of members electing a lump sum transfer in lieu of the deferred pension has been made. The proportion of future terminations electing a lump sum settlement is assumed to be 60%.

Proportion of Members with Spouses and Spousal 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 spouse. The proportion of members who will have a spouse is based on broad population statistics. The spousal age difference was based on broad population statistics.

Other

Asset Valuation Method

Assets are smoothed for the going concern valuation to remove the short-term volatility that is associated with investment in capital markets.

We determine the smoothed asset value by adjusting the market value to recognize the difference between each year's actual and "expected" investment earnings over a four–year period. "Expected" investment earnings are calculated by assuming the fund assets and cash flows earn the previous valuation's going–concern discount rate.

After application of the smoothing, we then restrict the smoothed value to between 90% and 110% of market value. This value is then adjusted by in-transit cash flows.

Actuarial Cost Method

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

The projected accrued benefit actuarial cost method has been used for this valuation. Under this method, the actuarial present value of benefits in respect of service prior to the valuation date, but based on pensionable earnings projected to retirement, is compared with the actuarial asset value, revealing either an excess 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.
The projected accrued benefit 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 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 excess which may serve to reduce future contribution requirements.

Appendix E: Hypothetical Wind-Up Assumptions and Methods

Valuation Assumptions

	January 1, 2022	January 1, 2021
Economic Assumptions		
Discount Rate		
Transfer value basis – Non Indexed		
Members under the age of 50	2.10% for 10 years; 3.10% thereafter	1.20% for 10 years; 2.80% thereafter
Transfer value basis – Indexed		
Members under the age of 50	0.70% for 10 years; 1.00% thereafter	0.60% for 10 years; 0.80% thereafter
Annuity purchase basis – Non Indexed		
Members over the age of 50	2.86% per annum	2.54% per annum
Annuity purchase basis – Indexed		
Members over the age of 50	-0.54% per annum	-0.81% per annum
Demographic Assumptions		
Retirement age		
Active and disabled members	Most valuable retirement age if age 50 or more with at least five years of Credited Service; otherwise age 65	Same
Deferred vested members Service before January 1, 2004	Age 65 if less than 50 at termination; otherwise, most valuable retirement age	Same
Service after January 1, 2004	Most valuable retirement age if age 50 or more at termination and had five years of Credited Service; otherwise age 65	Same

	January 1, 2022	January 1, 2021
Mortality rates	2014 Canadian Pensioners' Mortality Table combined with mortality improvement scale CPM-B (sex-distinct)	Same
Withdrawal rates	Not Applicable	Same
Termination of employment	Terminate with full vesting	Same
Marital status		
Non-retired spousal proportion	80%	Same
Non-retired spousal age differential	Males four years older	Same
Retired members	Actual marital status and ages are used	Same
Other		
Wind-up expenses	$500,000	Same
Minimum benefits		
Indexed benefit	Benefits cannot be less than employee contributions with interest	Same
Non-indexed benefit	Employee contributions with interest in excess of 50% of benefits are refunded to members	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
Hypothetical Wind-Up Incremental Normal Cost		
The assumptions for the expected benefit payments and decrement probabilities, service accruals, and projected changes in benefits and/or pensionable earnings	All assumptions, except for mortality rates are the same as going concern. Mortality rates are the same as the rates used in the hypothetical wind-up.	Same

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	0%	100%
Retirement eligible	100%	0%
Retired members and beneficiaries	100%	0%

Benefits Valued

	Hypothetical Wind-Up Valuation
Vesting	We have treated all accrued benefits as vested on Plan wind-up.
Consent benefits	Consent would not be granted for cost-of-living adjustments in respect of service after 2004 based on the Plan's funded position.

Justification for Valuation Assumptions

Hypothetical Wind-up: Non Indexed Rates

Lump-sum discount rate for 10 years
= V122542[1] + Mid-term bond yield spread adjustment
= 1.32% + 0.74%
= 2.06% (rounded to 2.10%) per year

Lump-sum discount rate thereafter
= V122544[1] + 0.5 x (V122544[1] – V122542[1]) + Long-term bond yield spread adjustment
= 1.77% + 0.5 x (1.77% – 1.32%) + 1.07%
= 3.07% (rounded to 3.10%) per year

Annuity purchase discount rate
= V39062[1] + Duration Adjustment
= 1.66% + 1.20%
= 2.86% per year

Hypothetical Wind-up: Fully Indexed Rates

Lump-sum discount rate for 10 years
= V122553[1] x (V122542[1] ÷ V122544[1]) + Mid-term bond yield spread adjustment
= -0.04% x (1.32% ÷ 1.77%) + 0.74%
= 0.74% (rounded to 0.70%) per year

Lump-sum discount rate thereafter
= V122553[1] + 0.5 x [V122553[1] - (V122542[1] x (V122553[1] ÷ V122544[1]))] + Long-term bond yield spread adjustment
= -0.04% + 0.5 x [-0.04% - 1.32% x (-0.04% ÷ 1.77%)] + 1.07%
= 1.02% (rounded to 1.00%) per year

Annuity purchase discount rate
= V39057[1] – 40bps
= -0.14% – 0.40%
= -0.54% per year

We have set the aforementioned assumptions based on guidance prepared by the Canadian Institute of Actuaries Committee on Pension Plan Financial Reporting ("PPFRC") in the Educational Note Assumptions for Hypothetical Wind-Up and Solvency Valuations with Effective Dates on or after December 31, 2021 and no later than December 30, 2022 ("CIA Guidance") released on March 11, 2022.

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.

For benefit entitlements that are expected to be settled by lump-sum transfer, we based the assumptions on Section 3500 (Pension Commuted Values) of the Canadian Institute of Actuaries' Standards of Practice using rates corresponding to a valuation date of January 1, 2022.

[1] CANSIM Series (annualized)

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

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.

Assumptions Not Needed
The following are not relevant to the hypothetical wind-up valuation:

- Increases in pensionable earnings;
- Termination of employment rates;
- Increases in YMPE (we used the 2022 YMPE);
- Increases in *Income Tax Act* maximum pension limit (we used the 2022 maximum); 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. We have assumed these fees would be $500,000 based on the assumption that the Company would continue to administer the payment of plan benefits after plan wind-up. We have not made an allowance for expenses related to surplus or deficit resolution.

Actuarial Cost Methods
Unit credit (accrued benefit) cost method as prescribed.

Asset Valuation Method Considerations
Assets for hypothetical wind-up purposes have been determined using market value, adjusted by in-transit cash flows.

Incremental Cost on a Hypothetical Wind-up Basis

The incremental cost on a hypothetical wind-up basis represents the present value, at the calculation date (time 0), of the expected aggregate change in the hypothetical wind-up 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
- Projected hypothetical wind-up liabilities at time t, discounted to time 0, allowing for, if applicable to the pension plan being valued:
  - expected decrements and related changes in membership status between time 0 and time t,
  - accrual of service to time t,
  - expected changes in benefits to time t,
  - a projection of pensionable earnings to time t,
- minus
- The hypothetical wind-up 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 (except mortality), 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 hypothetical wind-up 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 and assumed new entrants over the period between time 0 and time are considered in calculating the incremental cost.

Appendix F: Summary of Plan Provisions

This funding valuation was based on the October 1, 2015 version of the Plan text provided by the Company. Following is a summary of the main provisions of the Plan. For definitive interpretation of any specific Plan provision, the legal Plan text should be consulted.

Effective Date	January 1, 1979.
Employee Contributions	Prior to January 1, 2002 - Plan Members were required to contribute five percent (5.0%) of Earnings.
	After January 1, 2002 – Plan Members are required to contribute eight percent (8.0%) of Earnings.
Eligibility for Membership	
Full-time employees	Full-time Employees join the plan on the first of the month following completion of zero (0), three (3) months or six (6) months, depending on the waiting period selected by the Participating Employer.
Part-time employees	Part-time Employees join the plan on the first of the month following completion of two consecutive years of service in which the employee has earned at least 35% of the YMPE.
Cost of Living Adjustments	Deferred pensions and pensions in pay are increased January 1 each year based on 100% of the increase in the average Consumer Price Index in the 12 month period ended the previous September 30th.
Normal Retirement	
Eligibility	First of month coincident with or following attainment of age 65 or the date the Member completes 30 years of Continuous Service, being on that date at least age 55 or the date the Member completes five years of service, being on that date at least age 60.
Benefit	Monthly retirement benefit calculated as follows (a) 2.0% of the Member's best six year average earnings multiplied by the Member's Credited Service, LESS (b) 0.7% of the final three year average YMPE multiplied by the Member's Credited Service.

Early Retirement	
From active service	
Eligibility	First of month following the attainment of: ▪ Age 50 and completion of five years Credited Service; or ▪ Age 45 and completion of 30 or more years of Continuous Service.
Benefit	Monthly retirement benefit calculated as follows: 2.0% of the Member's best six year average earnings multiplied by the Member's Credited Service. If the member is 50 or more with 25 or more years of service, the benefit is reduced by the greater of: (a) five percent (5%) for each year that the member is less than age 55; or (b) five percent (5%) for each year that the member's Continuous Service is less than 30 years. If the member is 50 or more and has less than 25 years of Continuous Service, the benefit is reduced by five percent (5%) for each year that the member is less than age 60. If the member is between 45 and 50 and has completed 30 or more years of Continuous Service, the benefit is the Actuarial Equivalent of the age 55 pension. The benefit will be reduced, on the member's Normal Retirement Date, by 0.7% of the final three year average YMPE multiplied by the Member's Credited Service. The early retirement benefits are at least actuarially equivalent to the unreduced pension at normal retirement age.

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 benefit accrued to postponed retirement date.
Termination of Employment	
Non Vested	
Eligibility	Less than two (2) years of membership in the plan.
Benefit	Lump sum of member contributions with interest.
Vested	
Eligibility	Completion of two (2) years of plan membership.
Benefit	Normal retirement benefit reduced on an actuarial equivalent basis from age 65 or if the Member has attained 30 years of Continuous Service, from age 55
	In lieu of the monthly pension, members under age 50 may elect to transfer the lump-sum value of the deferred pension to an acceptable registered retirement income vehicle.

Preretirement Death	
Non Vested	Members with less than two years of plan membership are entitled to a death benefit equal to the member's contributions with interest.
Before Eligible for Retirement	
Eligibility	Following completion of two years of Plan membership.
Benefit	The death benefit is dependent on whether the member has a spouse and the number of dependent children as follows: The benefit for members with a spouse and dependent children is fifty percent (50%) of the Normal Retirement benefit before the 0.7% offset plus 10% for each dependent child up to a maximum of four (4) children. The benefit for members with dependent children but no spouse is twenty percent (20%) of the Normal Retirement benefit before the 0.7% offset for each dependent child up to a maximum of four (4) children. The benefit for members without a spouse or dependent children is the greater of member contributions with interest or the commuted value of the pension benefit earned by the member.
After Eligible for Retirement	
Eligibility	Following completion of two years of Plan membership.
Benefit	Immediate pension calculated as if the member had retired on the day before his/her death and elected to receive a pension in the normal form.
Disability	
Eligibility	Completion of 5 years of Credited Service prior to the date the Member becomes Totally and Permanently Disabled. If a Member on is on an Approved Period of Disability as at October 1, 2015 and is subsequently determined to be Totally and Permanently Disabled, the 5 year Credited Service requirement is waived.
Benefit	Immediate lifetime pension calculated as if the date of commencement was a Normal Retirement Date.

Maximum Benefit	The annual retirement benefit must not exceed the lesser of (1) and (2) below:
	(1) The defined benefit limit times years of credited service; and (2) 2% of the average of the best three consecutive years' earnings times credited service.
Normal Form of Payment	
Member Without Spouse or Dependent Children at Retirement	Life annuity with a guarantee of at least 60 monthly payments.
Member With Spouse and Dependent Children at Retirement	Life annuity and survivor pension equal to 50% of the Normal Retirement benefit before the 0.7% offset plus 10% per Dependent Child to a maximum of four (4) children.
Member with Dependent Children but without a Spouse at Retirement	Life annuity and survivor pension equal to 20% of the Normal Retirement benefit before the 0.7% offset per Dependent Child to a maximum of four (4) children.
Member with Spouse but without Dependent Children at Retirement	Life annuity and survivor pension equal to 50% of the Normal Retirement benefit before the 0.7% offset.
The above survivor pensions payable to the Spouse are limited to 66.67% of the Normal Retirement benefit after the 0.7% offset.	
Definitions	
Pensionable earnings	Member's base annual earnings excluding vacation pay, fees, allowances, overtime pay, or additional moneys paid in addition to the employee's ordinary salary or wages.
Credited interest	Average yield of five-year personal fixed term chartered bank deposits as determined under CANSIM B14045 for the previous 12-month period.

Appendix G: Administrator Certification

With respect to the Northern Employee Benefits Services Pension Plan, forming part of the actuarial report as at January 1, 2022, I hereby certify that, to the best of my knowledge and belief:

- The asset data contained in Appendix B of this report is complete and accurate;
- The membership data provided to Aon for the purpose of performing an actuarial valuation for **The Northern Employee Benefits Services'** Pension Plan as at January 1, 2022 is accurate and complete;
- The summary of the Plan provisions contained in Appendix F is an accurate summary of the Plan provisions; and
- The actuary has been notified of all relevant events subsequent to the valuation measurement date.

Shawn Maley
Name (print) of Authorized Signatory

CEO
Title

Signature

May 11/2023
Date

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About Aon

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