

# **NOVA SCOTIA RISK SHARING POOL**

## **MARCH 2023 OPERATIONAL REPORT**

### **ACTUARIAL HIGHLIGHTS**

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**ACTUARIAL HIGHLIGHTS**

**RSP NOVA SCOTIA**

**OPERATIONAL REPORT**

**MARCH 2023**

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## 1 Summary

Note to members: this is the quarterly Actuarial Highlights we will release going forward to replace the monthly Actuarial Highlights. The next report will be available for reporting month May 2023 in July 2023, in line with the valuation implementation schedule. Please contact us with any questions or concerns in regards to this matter.

### 1.1 Valuation Schedule (Fiscal Year 2023)

The March 2023 Operational Report incorporates the results of an updated valuation (as at December 31, 2023) – the impact of the implementation of the valuation is discussed in section 1.2. The following table summarizes the valuation implementations scheduled for fiscal year 2023.

NOVA SCOTIA RISK SHARING POOL FISCAL YEAR 2023 – SCHEDULE OF VALUATIONS			
Valuation Date	Discount Rate (per annum)	Operational Report	Description of Changes
Sep. 30, 2023	3.53% mfad 25 bp	Oct. 2023	update valuation (roll-forward): accident year 2023 loss ratio increased 0.2 points to 89.1%; discount rate increased by 37 basis points; no change to selected margins for adverse deviations
Mar. 31, 2023	5.50% (IFRS 17 does not have explicit interest rate margin )	Mar. 2023	update valuation: accident year 2023 loss ratio increased 2.6 points to 104.7%; discount rate increased by 13 basis points based on the risk free rate plus illiquidity premium from FIERA Capital; no change to selected margins for adverse deviations
Mar. 31, 2023	%	May. 2023	
Jun. 30, 2023	%	Aug. 2023	
Sep. 30, 2023	%	Oct. 2023	

Under the proposed schedule for fiscal year 2023, the off-half valuation quarters ending March 31, 2023 and September 30, 2023 would not reflect a full valuation update of assumptions, but would rather roll-forward key assumptions from the previous valuation.

### 1.2 New Valuation

A valuation of the Nova Scotia Risk Sharing Pool (“RSP”) as at December 31, 2023 has been completed since last month’s Operational Report and the results of that valuation have been incorporated into this month’s report. The valuation was completed by the Facility Association’s internal actuarial group

in conjunction with, and approved by, the Appointed Actuary, under the hybrid model for actuarial services. In general, this valuation was **unfavourable** to the RSP results due to:

- Higher projected LR's used in the valuation as a result of updated rate level factors and prior ultimate LR's

The valuation implementation impact is summarized in the following two tables, where the abbreviations PAYs refers to prior accident years, CAY refers to the current accident year (2023) and FtAY refers to future accident year (2024).

*Summary of Impact (\$000s) of Implementing Result of Valuation as at Dec. 31, 2023<sup>1</sup>*

**RSP: Nova Scotia**

Summary of Impact	Total \$ Impact	YTD COR Impact
LIC for Unpaid Claims	130	5.1%
Loss Component	541	21.4%
TOTAL	670	26.5%

**Change in LIC for unpaid claims**

	nominal [1]	apv adj. [2]	sub-total [3]	disc rate [4]	margins [5]	TOTAL [6]
PAYs	52	(18)	34	5	-	39
CAY	96	(6)	90	1	-	91
TOTAL	148	(24)	124	6	-	130

**Change in Loss Component**

	2023 (CAY)	2024 (FtAY)	TOTAL
Opening Loss Component	5,068	8,569	13,637
[1] Losses on onerous contracts	405	256	661
[2] Discount rate	(40)	(81)	(121)
[3] Reversal of losses on onerous contracts	(630)	(29)	(659)
TOTAL [1]+[2]+[3]	(265)	147	(118)
Ending Loss Component	4,803	8,716	13,519

*unfav/ (fav) for the month and ytd*

As indicated in the preceding table, the incorporation of the new valuation had an estimated **\$670 thousand unfavourable impact** on the month's net result from operations, adding an estimated 26.5 points to the **year-to-date Combined Operating Ratio**. The unfavourable LIC impact is primarily driven by unfavourable development in bodily injury and unfavourable impact due to an annual update of the claim payment patterns, partially offset by small favourable discount rate impact (claim payment pattern and discount rate impacts are both combined in column [4]). The unfavourable loss component impact in Nova Scotia is driven by increase to accident year 2023 and 2024 expected loss ratios.

The impact of the **nominal changes** on the LIC is shown in column [1] in the above table. The change in the selected nominal ultimates was **unfavourable by \$148 thousand**. This reflects the impact attributable to the changes in the selected ultimate loss ratios (i.e. for each accident year, it is the

<sup>1</sup>In these tables, "PAYs" refers to prior accident years, "CAY" refers to the current accident year, "FtAY" refers to future accident year, and "LIC" refers to liability for incurred claims. "Nominal" refers to changes excluding impact to discounting and risk adjustment, whereas "apv adj." refers to the impact on discounting and risk adjustment caused by change in the amount and timing of undiscounted liabilities. The columns labeled [1] and [2] reflect the impact of changes in the valuation selected ultimates (i.e. based on unchanged selection of discount rates and risk adjustment). The column "disc rate" reflects the impact of the change in the selected discount rate and claims payment patterns, and the column "margins" reflects the impact of any changes in the selected risk adjustment.

product of life-to-date earned premium for the accident year and the change in the selected ultimate loss ratio).

The **PAYs** overall showed a **\$52 thousand unfavourable** nominal variance or 0.1% of the PAYs nominal unpaid balance of \$57.2 million determined at the end of last month (February 2023).

The **CAY** LIC impact is a result of the change in the selected loss for accident year **2023 (increased 2.6 points to 104.7%)**. This change is a result of increased projected loss ratios in 2023 due to updated rate level factors and prior ultimate LRs.

The impacts related to actuarial present value (“apv”) adjustments are split into the impact prior to any change in the selected discount rate and selected risk adjustment factors (at the level they were selected i.e. jurisdiction and coverage), the impact of then updating the discount rate, and finally the impact of any changes to the risk adjustment factors (at the level they were selected). The changes in actuarial present value adjustments are shown in the preceding summary table in columns [2], [4], and [5].

Column [2] recognizes that changing the nominal selections also changed the unpaid estimates (including changes to the relative mix by coverage). This generated a favourable change of \$24 thousand in the actuarial present value adjustments, prior to any changes in the selected discount rate and/or risk adjustment.

Updated projected cash flows were reviewed against the risk-free curve plus illiquidity premium calculated monthly by the Fiera Capital Corporation<sup>2</sup> as at Dec. 31, 2023. It is assumed that the risk sharing pool cash flows are relatively illiquid. This means a yield curve with a higher illiquidity premium is used for the discounting calculations. Column [4] accounts for the change in the **discount rate** selected (average discount rate increased 13 basis points to **5.50%**), indicating a slight favourable impact, although this is slightly offset by an update to paid emergence selection completed annually in Q4.

Column [5] accounts for any changes to selected risk adjustment factors. The risk adjustment is based on a discounted cost of capital methodology. Capital factors are derived from MCT risk factors. Cost of Capital is determined from target return on equity and P/S ratio assumptions from pricing. Capital requirement is determined from a target MCT ratio based on industry data. Risk adjustment is calibrated annually and there is no change to the selection this quarter.

Risk Sharing Pools are onerous by design, as RSPs are designed for systematic under-pricing, which is expected to be unprofitable. We are assuming all RSPs are groups of onerous contracts. This means that the losses on these onerous contracts are recognized through a loss component upon initial recognition of the business. The change in the loss component is the sum of:

- [1] Losses on onerous contracts: This is the change in the loss component during the reporting period arising from Initial recognition and subsequent re-estimation of the loss component (due to changes in premium or loss ratio projections, for example). The table shown above splits out the impact of this item for the CAY and FtAY. The expected loss ratio increased by

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<sup>2</sup> <https://www.fieracapital.com/en/institutional-markets/cia-ifrs-17-curves>

2.7% and decreased by 0.7% respectively which corresponds to a combined total of **unfavourable \$661 thousand**.

- [2] Discount rate: This is the change in the loss component due to updating the yield curve. The impact of change in yield curve is **favourable \$121 thousand** driven by increased yields between the current and prior valuation.
- [3]: Reversal of losses on onerous contracts: This is the change in the loss component during the reporting period arising from the portion of the opening LRC earned during the period. This item has been presented in the table above to demonstrate the gradual decline of the loss component expected every month as the losses move from the LRC into the LIC.

Consideration was given to recent legal decisions and changes in legislation / regulation as noted above and outlined in section **Error! Reference source not found.**

### **1.3 Appointed Actuary and Hybrid Actuarial Services Model**

The Annual General Meeting of the members of Facility Association (“FA”) appointed Mr. Cosimo Pantaleo as the Appointed Actuary at its meeting on March 1st, 2023.

Facility Association operates under a hybrid model in relation to the management and provision of actuarial services. Under this model, actuarial services are performed by both Facility Association’s internal staff and its external actuarial consulting firm. The hybrid model approach maximizes the efficiency of resource allocation while providing access to additional expertise and capacity as needed.

### **1.4 Consideration of Recent Legal Decisions and Changes in Legislation / Regulation**

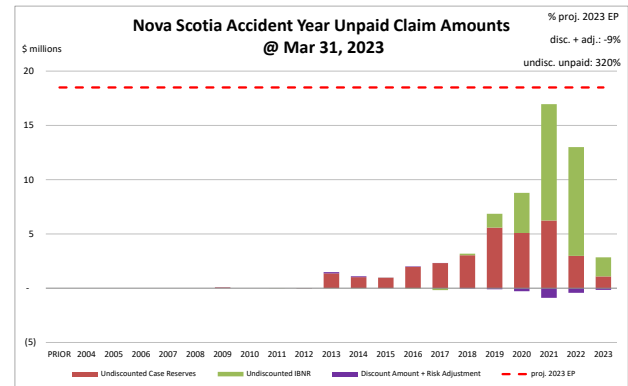
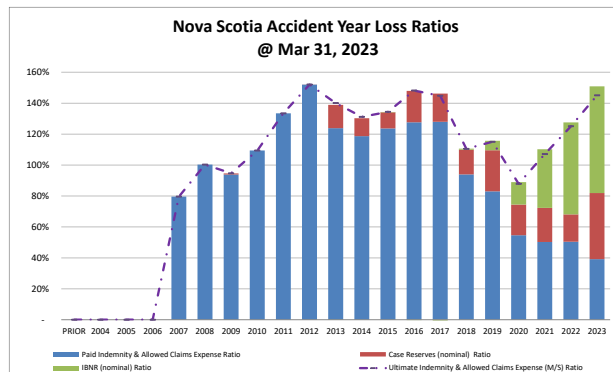
There have been no changes in these descriptions since last Highlights.

Consideration and assessment of potential impacts of legal decisions and changes in legislation / regulation constitutes a regular part of the valuation process. Descriptions of some of the more recent (i.e. within the last five years) changes are provided below.

The **Nova Scotia Court of Appeal** confirmed, in a unanimous decision released on **January 18, 2019** in relation to **Sparks v Holland (2019 NSCA 3)**, that future Canada Pension Plan (CPP) disability benefits are deductible from future income loss awards in motor-vehicle accident claims in that province. Sparks sustained injuries as a result of a motor vehicle accident in Nova Scotia and sought damages for personal injuries and loss of income. The decision supported an earlier decision (Tibbets v Murphy, 2017 NSCA 35) that both past and future CPP disability benefits are deductible under section 133A of the Insurance Act. At the current time, no adjustments have been made to our valuation estimates as a result of this decision, and at this point we do not believe this judgment will have a further impact on our valuation results.

## 1.5 Current Provision Summary

The following charts show the current levels of claim liabilities<sup>3</sup> booked by accident year. The left chart displays life-to-date payments, case reserves, IBNR, and the total including actuarial present value adjustments against accident year earned premium. The right chart shows the associated dollar amounts for the components of the claim liabilities and the current projected amount of 2023 full year earned premium (the red hash-mark line) to provide some perspective.



*"M/S" refers to "Member Statement" values – that is, actuarial present value adjustments at the selected discount rate.*

liability for incurred claims (\$000s)

	amt	%
undisc. case	31,711	55.1%
undisc. ibnr	27,444	47.7%
disc. + risk adj.	(1,608)	(2.8%)
LIC	57,547	100.0%

The current discount and risk adjustments (-\$1.6 million – see the following table) represents -9% of the earned premium projected for the full year 2023 (see the upper right corner of the preceding chart on the right). If our current estimates of the nominal unpaid amounts prove to

match actual claims payments, the actuarial present value adjustments will be released into the net operating result over future periods.

The table to the left breaks down Liability for Incurred Claims total into component parts, showing that the majority of the claim liabilities for this RSP is in case reserves. Approximately 76% of the IBNR balance relates to accident years 2021 and 2022 (see Exhibit B). Approximately 81% of the liabilities for incurred claims are related to accident years 2019-2023 inclusive (i.e. the most recent 5 accident years), and approximately 3% is related to accident years 2013 and prior (i.e. prior to the most recent 10 accident years).

The following tables summarize the liability for remaining coverages and insurance contract liabilities.

<sup>3</sup>Claim liabilities refer to provision for unpaid indemnity and allowed claims expenses. Allowed claims expenses are first party legal and other expenses as listed in the RSP Claims Guide. Claims expenses paid through the member company expense allowance are NOT included in this discussion.

premium liabilities (\$'000s)			policy liabilities (\$'000s)		
	amt	%		amt	%
unearned prem	8,069	99.1%	claim	61,025	85.8%
prem def/(dpac)	(40)	(0.5%)	premium	8,029	11.3%
M/S apv adjust.	110	1.4%	M/S apv adjust.	2,042	2.9%
M/S total	8,139	100.0%	M/S total	71,096	100.0%

## 2 Activity since previous valuation implementation

### 2.1 Recorded Premium and Claims Activity

The following table summarizes the extent to which premiums and claims amounts recorded since the prior implementation differ from the prior projection.

*Nova Scotia RSP Actual vs Projected Summary: Recorded Transaction Amounts (\$ thousands)*

AY Group	Share Year	Share Month	Actual Earned Premium (000s)	Actual minus Projected Earned Premium (000s)	Actual Paid Claims (000s)	Actual minus Projected Paid Claims (000s)	Actual Recorded Claims (000s)	Actual minus Projected Recorded Claims (000s)
PAY	2022	November	(2)	(2)	1,056	816	54	(162)
		December	4	4	696	290	281	(241)
	2023	January	(53)	(53)	561	(248)	796	184
		February	(1)	(1)	1,038	201	704	112
		March	(11)	(11)	271	(592)	509	(159)
PAY Total			(63)	(63)	3,622	467	2,344	(266)
CAY	2022	November	1,144	(64)	906	354	833	310
		December	1,219	40	587	(180)	832	(59)
	2023	January	1,258	97	55	(518)	429	(464)
		February	1,211	214	525	(67)	929	9
		March	1,286	35	847	285	1,357	490
CAY Total			6,118	322	2,920	(126)	4,380	286
Grand Total			6,055	259	6,542	341	6,724	20

(Recorded transaction amounts exclude IBNR & other actuarial provisions)

Claims transaction activity is generally volatile and changes from one month to the next are anticipated due to this natural “process variance” (i.e. random variation), and this is particularly true where volumes are low as found in this RSP. Each month, the projection variances are reviewed for signs of projection bias and to identify potential ways to reduce the level of the variance. The variances are also reviewed as part of the quarterly valuation process, as an indicator of changes in the claims development process or potential bias in ultimate claims estimates.

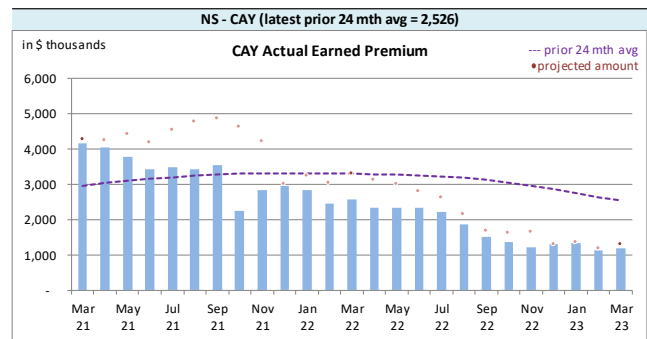
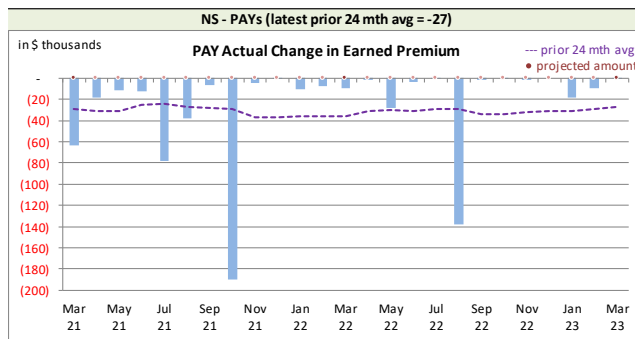
More detailed analysis and commentary on actual vs. projected for the most recent reporting months is provided below.



## 2.1.a Actual vs. Projected (AvsP): Earned Premium

The following charts show actual **earned premium**<sup>4</sup> activity in each of the most recent 25 calendar months, along with a “prior 24-month average” to show how each month’s actual compares with the average amount of the preceding 24 calendar months.

*Nova Scotia RSP Actual **Earned Premium** by Calendar Month*



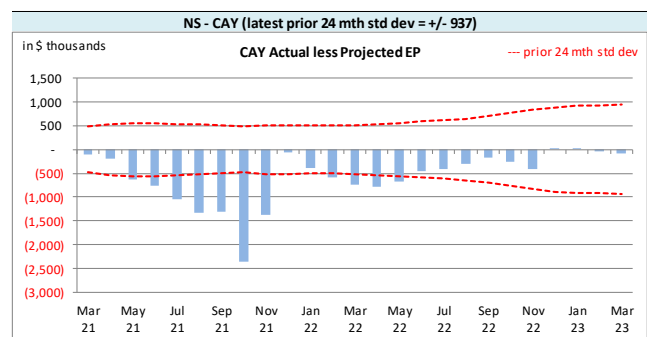
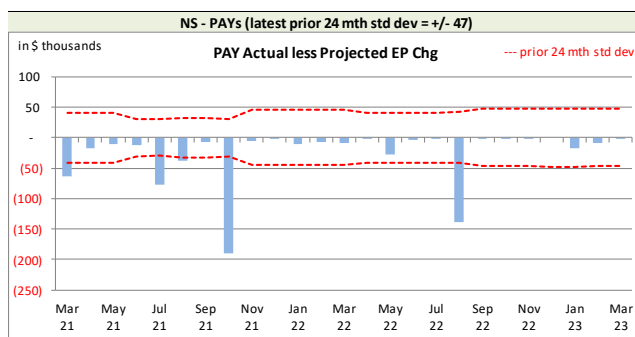
On Latest \$ thousands			
	Earned Premium	PAYs	CAY
Mthly Avg EP Chg (prior 24 mths)	(27)	2,526	
std dev	47	937	
A-P <> std dev	5	11	
% <> std dev	20.0%	44.0%	
norm <> std dev	31.7%	31.7%	
performance vs 24-mth avg:	better	worse	

**Earned premium** changes during a given calendar month in relation to prior accident years tend to be at modest levels, although relatively high levels generally occur at the beginning of each year.

The associated variance between the actual changes and the projections from the previous month are shown in the following charts. **Earned**

**premium** change projections are all attributed to the current accident year as the projection upload does not accept **earned premium** changes for other accident years. We do not see this limitation as being significant for our purposes, but it does mean that the actual less projection variance will equal the actual **earned premium** change in relation to prior accident years.

*Nova Scotia RSP Actual vs. Projected Summary: **Earned Premium** Variances by Calendar Month*



We project **earned premium** changes from known unearned premium balances and projected written premium levels, but upload the total projections as current accident year (CAY). This process

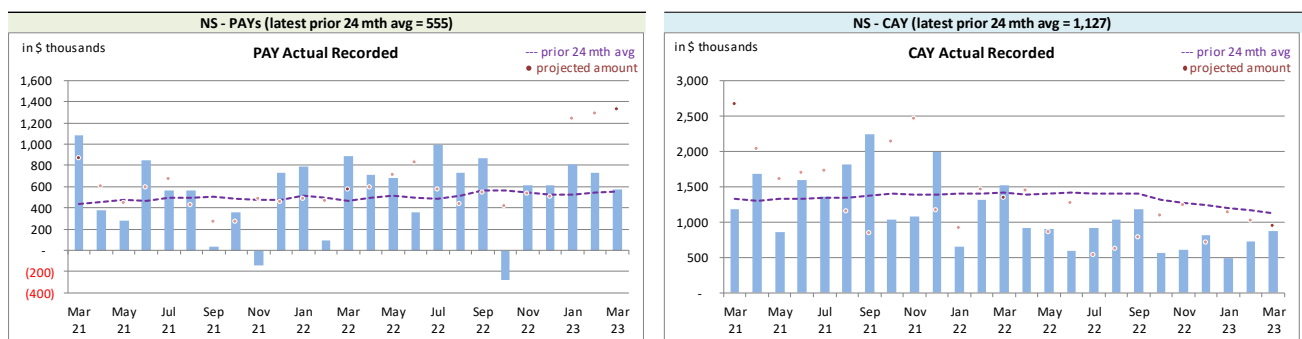
<sup>4</sup>Premium is earned on a daily basis based on the transaction term measured in days. As a result, months with 31 days earned relatively more than those with 30 days, and February earns the least.

has generated prior accident years' (PAYs) bias<sup>5</sup>, with actuals generally lower than projected, although the magnitude is not high relative to monthly premium. In addition to the PAYs' bias, the CAY has also shown bias<sup>6</sup>, with actuals being generally lower than projected, and while we modified our projections processes in response, bias still exists. Over time, we may consider other projection approaches to address the bias issue, but it is not currently deemed as priority.

## 2.1.b AvsP: Recorded Indemnity & Allowed Claims Expense

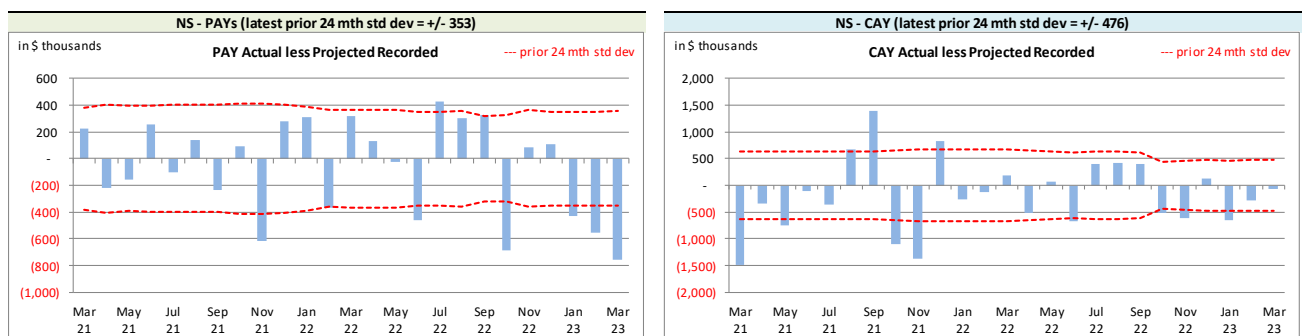
The following charts show actual **recorded** activity (**paid** and case reserve changes), in each of the most recent 25 calendar months, along with a "prior 24-month average" to show how each month's actual compares with the average amount of the preceding 24 calendar months.

*Nova Scotia RSP Actual **Recorded** by Calendar Month*



**Recorded** activity variances from the previous month's projections are shown in the following charts, including the "prior 24-month standard deviation" levels to show how the variances from projection compare with historical standard deviations.

*Nova Scotia RSP Actual vs Projected Summary: **Recorded** Variances by Calendar Month*



<sup>5</sup>The PAYs' variances will show bias as the projection upload forces all earned premium projections to be attributed to the CAY.

<sup>6</sup>We measure bias based on a 95% confidence range for a binominal distribution with trials based on the range being considered (25 in this case) and 50% probability of success. The rolling 25-month CAY variances at May 2023 has only 7 months where the actuals were higher than projected, and as the 95% confidence range is 8 to 17, bias continues to be indicated.

On Latest \$ thousands		
<b>Recorded</b>	PAYs	CAY
Mthly Avg Recorded (prior 24 mths)	555	1,127
std dev	353	476
A-P <> std dev	9	11
% <> std dev	36.0%	44.0%
norm <> std dev	31.7%	31.7%
performance vs 24-mth avg:	no better	worse

With respect to **recorded** indemnity & allowed claims expense activity, caution must be exercised in reviewing the variances as this is a small pool and single claim transactions that are normal course for the business may look unusual and generate relatively significant variances that in nominal value terms are not that significant in relative or

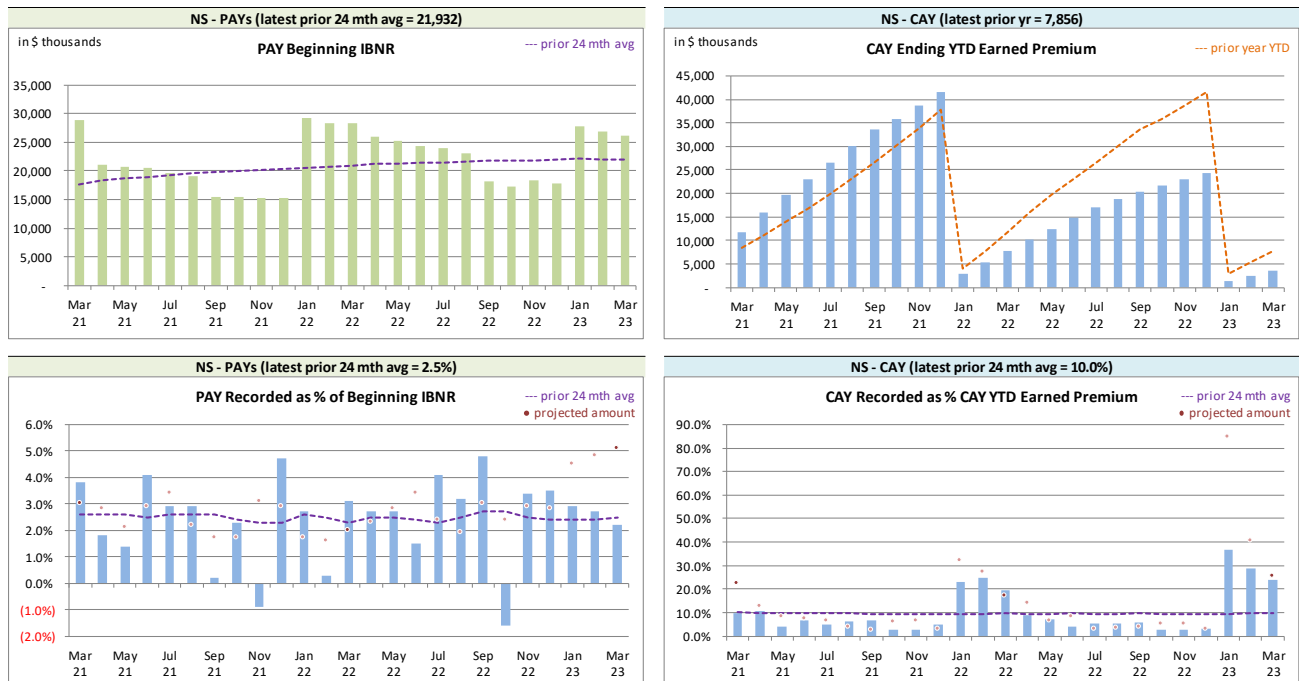
overall terms. That said, 36% of prior accident years' (PAYs) **recorded** variances over the last 25 calendar months have fallen outside of one standard deviation of the actual **recorded** amounts (see the preceding table), suggesting the projection process has performed worse than simply projecting the prior 24-month average amount (assuming it follows a normal distribution). Bias has not been indicated at a 95% confidence level on a rolling 25-month basis (14 of 25 variances are positive).

The current accident year (CAY) **recorded** variances fell outside of one standard deviation 48% of the time over the last 25 calendar months (see preceding table on the left), suggesting that the projection process has performed worse than simply projecting the prior 24-month average amount. We are considering ways to improve our projection process as a result, but efforts so far have fallen short. Bias has not been indicated at a 95% confidence level on a rolling 25-month basis (8 of 25 variances are positive).

The method for establishing IBNR adjusts automatically for changes in **earned premium** and **recorded** claims activity level (see sections 2.2 and 3).

We have included, for reference, the following charts related to levels influencing **recorded** activity. Note in particular the increase in the level of PAY beginning IBNR. Part of this will be as a response to valuations and showing up as a beginning IBNR change one month after the valuation is implemented (i.e. April, June, September, and November), and part will also reflect the maturity level of the RSP.

## Nova Scotia RSP Levels that influence<sup>7</sup> Recorded activity by Calendar Month



We track PAY beginning IBNR as **recorded** activity comes out of IBNR. Changes in the PAY beginning IBNR (see upper left of the preceding group of charts) occur for several possible reasons:

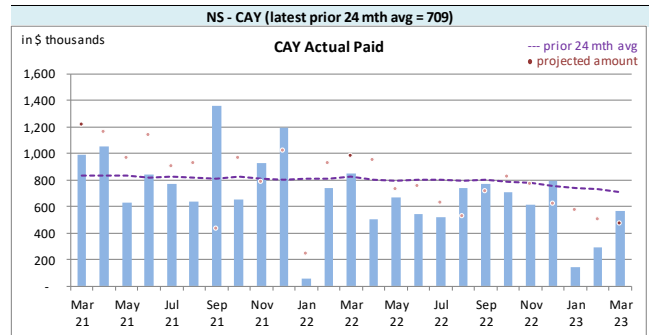
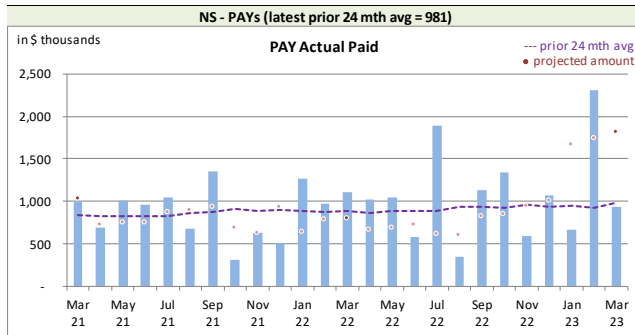
- to offset actual **recorded** activity (through loss ratio matching);
- the annual switchover as a CAY becomes a PAY (occurs in January); and
- when a new valuation is implemented, where the valuation resulted in changes to the selection of PAYs' ultimates (will show up as a beginning IBNR change one month after the valuation is implemented, i.e. the change will generally show in April, June, September, and November).

### 2.1.c AvsP: Paid Indemnity & Allowed Claims Expense

The following charts show actual **paid** activity in each of the most recent 25 calendar months, along with a "prior 24-month average" to show how each month's actual compares with the average amount of the preceding 24 calendar months.

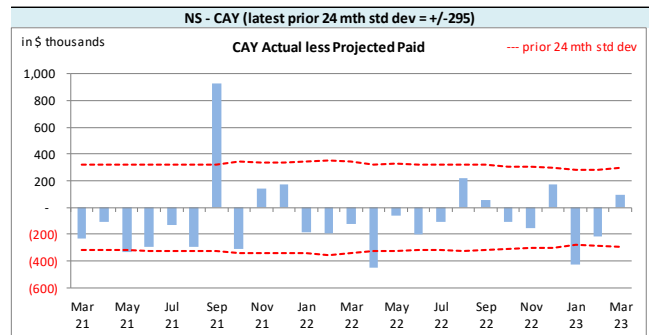
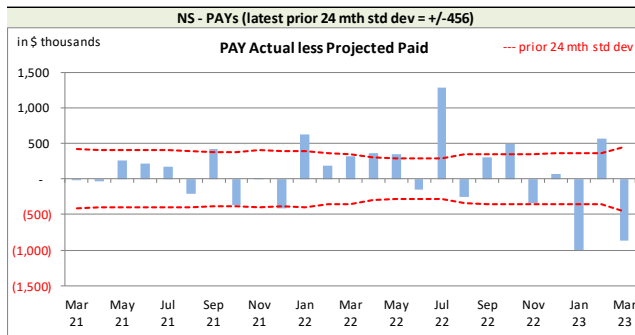
<sup>7</sup>Our recorded activity projections for the prior accident years are based on selected ratios of recorded activity to beginning unpaid balances, whereas the current accident year projections are based on selected ratios of year-to-date IBNR to year-to-date selected ultimate (i.e. selected LR x earned premium), deriving year-to-date recorded as selected ultimate less IBNR. In both cases, the ratio selection is based on our review of the more recent recorded activity and recent AvsP analyses.

## Nova Scotia RSP Actual **Paid** by activity Calendar Month



**Paid** activity variances from the previous month's projections are shown in the following charts, including the "prior 24-month standard deviation" levels to show how the variances from projection compare with historical standard deviations.

## Nova Scotia RSP Actual vs Projected Summary: **Paid** Variances by Calendar Month



On Latest \$ thousands		
	<b>Paid</b>	
Mthly Avg Paid (prior 24 mths)	981	709
std dev	456	295
A-P <> std dev	10	4
% <> std dev	40.0%	16.0%
norm <> std dev	31.7%	31.7%
performance vs 24-mth avg:	worse	better

With respect to **paid** indemnity & allowed claims expense activity, caution must be exercised in reviewing the variances as this is a small pool and single claim transactions that are normal course for the business may look unusual and generate relatively significant variances that in nominal value terms are not that significant in relative or

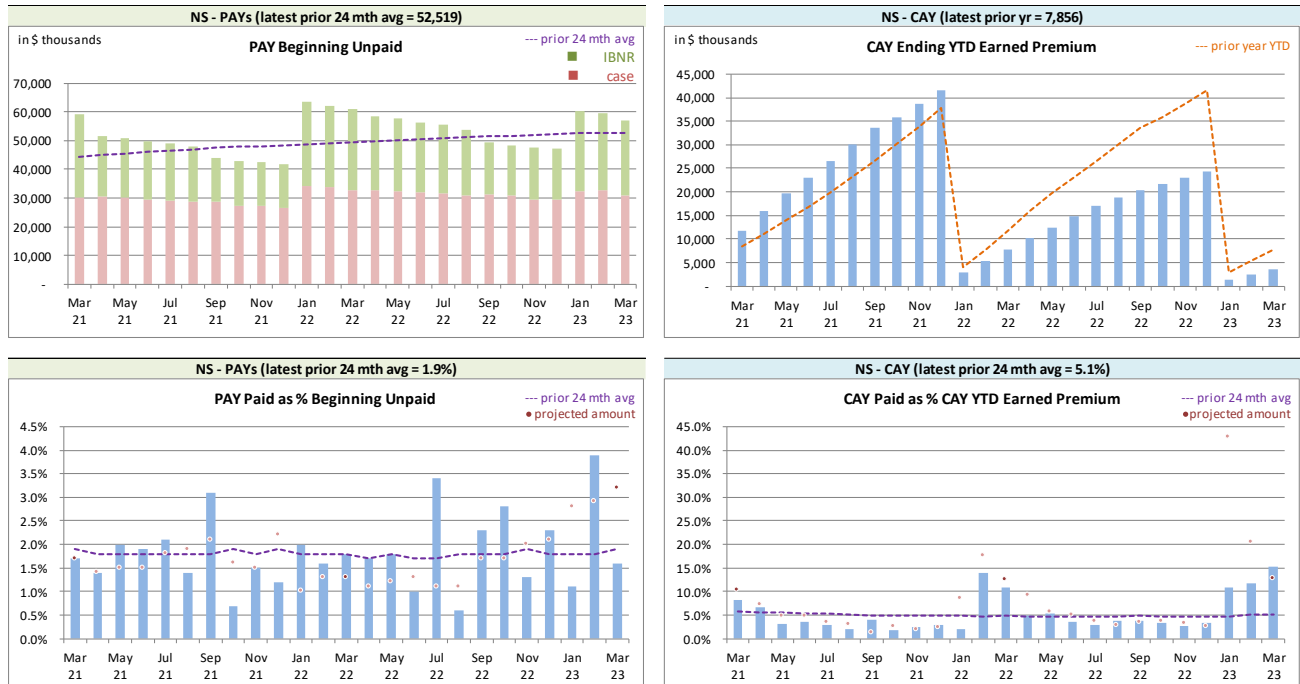
overall terms. That said, 32% of the prior accident years' (PAYs) variances over the last 25 calendar months have fallen outside of one standard deviation of the actual **paid** amounts (see preceding table on the left), suggesting the projection process has performed better than simply projecting the prior 24-month average amount (assuming it follows a normal distribution). Bias has been indicated at a 95% confidence level on a rolling 25-month basis 14 of 25 variances are positive).

The current accident year (CAY) **paid** variances fell outside of one standard deviation 16% of the time over the last 25 calendar months (see the preceding table), suggesting that the projection process has performed no better than simply projecting the prior 24-month average amount. Bias has not been indicated at a 95% confidence level on a rolling 25-month basis (7 of 25 variances are positive).

We have included, for reference, the following charts related to levels influencing **paid** activity. Both case and IBNR increases contribute to the increase of PAY beginning unpaid. This is somewhat

expected, given the maturity level of the RSP.

### Nova Scotia RSP Levels that influence<sup>8</sup> Paid activity by Calendar Month



We track the PAY beginning unpaid balance (case and IBNR) as **paid** activity comes out of the unpaid balance. Changes in the PAY beginning unpaid balance (see upper left of the preceding group of charts) occur for several possible reasons:

- to offset actual **paid** activity (may reduce case or IBNR or both);
- the annual switchover as a CAY becomes a PAY (occurs in January); and
- when a new valuation is implemented, where the valuation resulted in changes to the selection of PAYs' ultimates (will show up as a beginning unpaid balance change one month after the valuation is implemented, i.e. the change will generally show in April, June, September, and November).

## 2.2 Actuarial Provisions

An ultimate loss ratio matching method (described in section 3) was used to determine the month's IBNR<sup>9</sup>, and factors were applied to the nominal unpaid claims liability (case plus IBNR) to determine the discount amount (shown as a negative value to indicate its impact of reducing the liability) and

<sup>8</sup>Our paid projections for the prior accident years are based on selected ratios of paid to beginning unpaid balances, whereas the current accident year projections are based on selected ratios of year-to-date paid to year-to-date selected ultimate indemnity (i.e. selected LR x earned premium). In both cases, the ratio selection is based on our review of the more recent recorded activity and recent AvsP analyses.

<sup>9</sup>For ease of discussion, "IBNR" is used in place of "provisions for incurred but not recorded (IBNR) and development".

the Provisions for Adverse Deviations. The loss ratios and the factors used to determine the current month's provisions and projections were based on the applicable valuation.

Exhibit G shows the accident year IBNR amount change from last month to this month broken down into:

- (i) the change projected last month;
- (ii) the additional change due to variances in earned premium (because we apply a loss ratio to earned premium in determining ultimate level) and/or recorded claims (as IBNR is calculated as ultimate less recorded) differences; and
- (iii) the additional change due to valuation implementation impacts (as applicable)

### **3 Ultimate Loss Ratio Matching Method**

An "ultimate loss ratio matching method" continues to be applied to the current month and two projected months shown in the Operational Reports, with IBNR determined by accident year as follows:

- (a) Earned premium to-date
- (b) Ultimate loss<sup>10</sup> ratio per latest valuation
- (c) Estimated ultimate incurred = (a) x (b)
- (d) Recorded indemnity & allowed claims expense to-date
- (e) IBNR = (c) – (d)

### **4 Calendar Year-to-Date Results**

The following table summarizes the calendar year-to-date results for indemnity & allowed claims expenses<sup>11</sup>, including IBNR.

In calculating the amounts as percentages of earned premium, the calendar year-to-date earned premium has been used, which includes not only the earned premium associated with the current accident year, but also earned premium adjustments related to prior accident years. Specifically, the current accident year (CAY) ratio in the table is 104.7% rather than 104.7% (the valuation ultimate ratio for accident year 2023), as the calendar year-to-date earned premium includes prior accident year earned premium adjustments. (Note that the ratios in this table may differ slightly from those shown in the Nova Scotia RSP Summary of Operations due to rounding.)

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<sup>10</sup>"Loss" here refers to indemnity and allowed claims expenses, but does not include the claims expense allowance included in member company overall expense allowances ("Expense Allowance" in the Operational Report).

<sup>11</sup>Allowed claims expenses are first party legal and other expenses as listed in the RSP Claims Guide. Claims expenses paid through the member company expense allowance are NOT included in this analysis.

*Nova Scotia RSP Calendar Year-to-Date Indemnity & Allowed Claims Expense Summary (\$ thousands)*

	YTD Nominal Values		YTD actuarial present value adjustment		YTD Total	
	Amount	%EP	Amount	%EP	Amount	%EP
PAYs	28	0.8%	740	20.1%	768	20.9%
CAY	3,847	104.7%	(149)	(4.1%)	3,698	100.6%
TOTAL	3,876	105.5%	591	16.1%	4,466	121.5%

("% EP" based on 2023 calendar year-to-date earned premium; ratios may not total due to rounding)

In general, prior accident years (PAYs) changes from last month are due to the release of the actuarial present value adjustments with claims payments, except when valuations are implemented. The loss ratio change year-to-date in Table 04 reflects not only changes in the prior accident year levels, but also the increase in the calendar year-to-date earned premium with an additional month's earned premium, and due to the impact of valuation implementation.

For the current accident year (CAY), changes in the year-to-date total reflects the additional month's exposure and regular changes to actuarial present value adjustments as the year ages, and due to the impact of valuation implementation.

## 5 Current Operational Report – Additional Exhibits

Section 6 provides exhibits pertaining to the actuarial provisions reflected in the current month's Operational Report.

IBNR (including actuarial present value adjustments) presented in section 6, Exhibit A, were derived on a discounted basis, and therefore reflect the time value of money and include an explicit provision for adverse deviations in accordance with accepted actuarial practice in Canada.

IBNR presented in section 6, Exhibit B, does NOT include any actuarial present value adjustments. The "Total IBNR" from this exhibit is shown in the Operational Report as "Undiscounted IBNR".

The ultimate loss ratios detailed in section 6, Exhibit B, refer to the estimates derived on the basis of various actuarial methodologies applied to the experience of the Nova Scotia Risk Sharing Pool for the purposes of the most recent quarterly valuation. As discussed in section 3, IBNR reflected in the current month's Operational Report was derived as the difference between the estimated ultimate for the claims amount (i.e. earned premium x ultimate loss ratio) and the associated current recorded amounts (life-to-date payments plus current case reserves).

In addition to the exhibits printed below, we are making supplementary data files available for download from our website for members who require additional detailed data on the LRC calculation as well as the payment patterns and actual and projected premiums, risk adjustment, interest rate, loss ratios and expenses of the pools.



## 6 EXHIBITS

The exhibits listed below are provided on the pages that follow:

EXHIBIT A	IBNR for Member Sharing – includes Actuarial Present Value Adjustments
EXHIBIT B	IBNR
EXHIBIT C	Liability for Remaining Coverage
EXHIBIT D	Projected Year-end Policy Liabilities
EXHIBIT E	Risk Adjustment & Discount Rate
EXHIBIT F	Interest Rate Sensitivity
EXHIBIT G	Components of IBNR Change During Month

Additional exhibits available online:

[LRC Calculation file](#)

[Detailed valuation results](#)

EXHIBIT A

IBNR for Member Sharing – includes Actuarial Present Value Adjustments

EXHIBIT A - IBNR + M/S Actuarial Present Value Adjustments: RSP Nova Scotia									
amounts in \$000s									
Accident Year	Actual Feb 2023	Actual Mar 2023	Projected Apr 2023	Projected May 2023	Projected Jun 2023	Projected Jul 2023	Projected Aug 2023	Projected Dec 2023	
prior	-	-	-	-	-	-	-	-	-
2004	-	-	-	-	-	-	-	-	-
2005	-	-	-	-	-	-	-	-	-
2006	-	-	-	-	-	-	-	-	-
2007	-	-	-	-	-	-	-	-	-
2008	-	-	-	-	-	-	-	-	-
2009	5	6	6	7	7	7	8	9	9
2010	0	0	0	0	0	0	0	0	0
2011	0	0	0	0	0	0	0	0	0
2012	0	0	0	0	0	0	0	0	0
2013	75	105	74	38	(2)	(1)	(1)	(1)	(1)
2014	60	80	114	151	192	135	71	1	1
2015	16	28	18	9	(1)	(63)	(126)	(482)	(482)
2016	59	20	32	43	54	61	66	72	72
discount rate: 5.50%	2017	(37)	(172)	(145)	(120)	(95)	(71)	(47)	8
	2018	1,194	116	111	105	98	97	96	97
	2019	216	1,175	1,092	1,007	920	840	758	556
weighted average risk adjustment factor: 8.84%	2020	3,363	3,423	3,215	3,004	2,793	2,617	2,439	1,720
	2021	9,755	9,838	9,608	9,375	9,139	8,896	8,650	7,468
	2022	9,630	9,606	9,423	9,241	9,059	8,847	8,636	7,767
	2023	1,190	1,610	1,612	1,679	1,712	1,783	1,919	5,820
	TOTAL	25,528	25,836	25,160	24,540	23,876	23,148	22,469	23,036
Change			308	(676)	(619)	(664)	(728)	(679)	

Please see Exhibit G, page 1 for Components of Change during Current Month

EXHIBIT B

IBNR

EXHIBIT B - Undiscounted IBNR: RSP Nova Scotia									
amounts in \$000s									
Ultimate Loss Ratio	Accident Year	Actual Feb 2023	Actual Mar 2023	Projected Apr 2023	Projected May 2023	Projected Jun 2023	Projected Jul 2023	Projected Aug 2023	Projected Dec 2023
	prior	-	-	-	-	-	-	-	-
0.0%	2004	-	-	-	-	-	-	-	-
0.0%	2005	-	-	-	-	-	-	-	-
0.0%	2006	-	-	-	-	-	-	-	-
53.9%	2007	-	-	-	-	-	-	-	-
68.2%	2008	-	-	-	-	-	-	-	-
63.8%	2009	-	-	-	-	-	-	-	-
73.4%	2010	0	0	0	0	0	0	0	0
90.1%	2011	0	0	0	0	0	0	0	0
101.5%	2012	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)
92.0%	2013	(15)	(10)	(7)	(4)	(1)	(0)	(0)	0
86.9%	2014	(4)	(1)	(1)	(1)	(1)	(1)	(0)	0
88.8%	2015	(1)	17	4	(9)	(22)	(86)	(150)	(514)
96.5%	2016	35	(25)	(20)	(15)	(10)	(6)	(2)	2
97.7%	2017	(34)	(173)	(156)	(139)	(122)	(106)	(90)	(61)
76.8%	2018	1,244	142	122	102	82	70	57	19
80.2%	2019	352	1,277	1,161	1,045	929	821	713	431
61.1%	2020	3,704	3,706	3,453	3,199	2,946	2,731	2,515	1,661
75.5%	2021	10,764	10,726	10,408	10,089	9,771	9,447	9,123	7,650
88.6%	2022	10,159	10,027	9,840	9,652	9,464	9,247	9,030	8,138
104.7%	2023	1,315	1,759	1,790	1,891	1,954	2,063	2,240	6,463
	<b>TOTAL</b>	<b>27,519</b>	<b>27,444</b>	<b>26,592</b>	<b>25,809</b>	<b>24,990</b>	<b>24,179</b>	<b>23,436</b>	<b>23,791</b>
	Change		(75)	(852)	(782)	(819)	(812)	(743)	

Please see Exhibit G, page 2 for Components of Change during Current Month

EXHIBIT C

Liability for Remaining Coverage

EXHIBIT C - Liability for Remaining Coverage: RSP Nova Scotia									
amounts in \$000s									
Accident Year		Actual Feb 2023	Actual Mar 2023	Projected Apr 2023	Projected May 2023	Projected Jun 2023	Projected Jul 2023	Projected Aug 2023	Projected Dec 2023
LRC <span style="color: red;">excl.</span> Loss Component									
	2023	4,563	3,679	3,265	3,284	3,008	2,934	2,726	(212)
	2024	35	126	299	737	1,579	2,236	3,114	6,829
	2025	-	-	-	-	-	-	-	-
	2026	-	-	-	-	-	-	-	-
Total		4,598	3,805	3,564	4,021	4,587	5,170	5,840	6,617
Undiscounted Loss Component									
	2023	7,894	7,296	6,718	6,114	5,512	4,858	4,176	-
	2024	13,430	13,556	13,556	13,556	13,556	13,556	13,556	13,556
	2025	-	-	-	-	-	-	-	-
	2026	-	-	-	-	-	-	-	-
Total		21,323	20,852	20,275	19,670	19,068	18,414	17,732	13,556
Discounted Loss Component									
	2023	5,068	4,803	4,445	4,060	3,674	3,248	2,803	-
	2024	8,569	8,716	8,745	8,761	8,750	8,765	8,776	8,894
	2025	-	-	-	-	-	-	-	-
	2026	-	-	-	-	-	-	-	-
Total		13,637	13,519	13,190	12,821	12,424	12,013	11,579	8,894
LRC <span style="color: red;">incl.</span> Loss Component									
	2023	9,631	8,482	7,710	7,344	6,682	6,182	5,529	(212)
	2024	8,604	8,842	9,044	9,498	10,329	11,001	11,890	15,723
	2025	-	-	-	-	-	-	-	-
	2026	-	-	-	-	-	-	-	-
Total		18,235	17,324	16,754	16,842	17,011	17,183	17,419	15,511

EXHIBIT D

Projected Year-end Policy Liabilities

The table below presents the projected policy liabilities as at December 31, 2023, broken down by component.

Nova Scotia	Projected Balances as at Dec. 31, 2023 (\$000s)											
Ending 2023	nominal values			actuarial present value adjustments (apvs)								
Accident Year	Case	IBNR	Total Unpaid	Discount Amount	Risk Adjustment	Liability for Incurred Claims (LIC)	Discounted Loss Component	Undiscounted Loss Component	Discount Amount	Liability for Remaining Coverage (LRC)	LRC excl. Loss Component	Total Insurance Contract Liabilities
prior	-	-	-	-	-	-	-	-	-	-	-	-
2004	-	-	-	-	-	-	-	-	-	-	-	-
2005	-	-	-	-	-	-	-	-	-	-	-	-
2006	-	-	-	-	-	-	-	-	-	-	-	-
2007	-	-	-	-	-	-	-	-	-	-	-	-
2008	-	-	-	-	-	-	-	-	-	-	-	-
2009	68	-	68	2	7	77	-	-	-	-	-	77
2010	-	0	0	-	-	0	-	-	-	-	-	0
2011	-	0	0	-	-	0	-	-	-	-	-	0
2012	5	(0)	5	0	0	5	-	-	-	-	-	5
2013	(5)	0	(5)	(0)	(0)	(6)	-	-	-	-	-	(6)
2014	8	0	8	0	1	9	-	-	-	-	-	9
2015	1,105	(514)	592	(19)	50	623	-	-	-	-	-	623
2016	1,061	2	1,063	(24)	94	1,133	-	-	-	-	-	1,133
2017	1,683	(61)	1,623	(73)	141	1,691	-	-	-	-	-	1,691
2018	2,312	19	2,331	(123)	201	2,409	-	-	-	-	-	2,409
2019	4,288	431	4,719	(279)	404	4,844	-	-	-	-	-	4,844
2020	5,400	1,661	7,061	(535)	593	7,120	-	-	-	-	-	7,120
2021	6,700	7,650	14,350	(1,359)	1,177	14,167	-	-	-	-	-	14,167
2022	3,308	8,138	11,447	(1,291)	920	11,076	-	-	-	-	-	11,076
PAYs subtotal	25,933	17,328	43,261	(3,699)	3,587	43,149	-	-	-	-	-	43,149
CAY (2023)	5,832	6,463	12,295	(1,611)	968	11,652	-	-	-	(212)	(212)	11,440
FIAY (2024)	-	-	-	-	-	-	8,894	13,556	(4,662)	15,723	6,829	15,723
Total	31,765	23,791	55,556	(5,310)	4,555	54,801	8,894	13,556	(4,662)	15,511	6,617	70,312

**EXHIBIT E**
**Risk Adjustment & Discount Rate**

The tables below present selected risk adjustment factor by coverage (the total is a weighted average, based on the unpaid claims projection for December 31, 2023 from the valuation), followed by the selected discount rate.

**Risk Adjustment Factors: RSP Nova Scotia**

<b>Coverage</b>	<b>Government Line</b>	<b>Nova Scotia</b>
Bodily Injury	Third Party Liability	9.27%
Property Damage (w DCPD)	Third Party Liability	2.94%
AccBen (indivis)	Accident Benefits	7.52%
Uninsured Automobile	Accident Benefits	7.30%
Underinsured Motorist	Other Coverages	9.23%
Collision w AP	Other Coverages	1.89%
Comprehensive w SP	Other Coverages	1.77%
<b>Total</b>	<b>Total</b>	<b>8.84%</b>

discount rate: 5.50%

EXHIBIT F

Interest Rate Sensitivity

The tables below present sensitivity to the member statement claims liability as projected to Dec. 31, 2023 from the latest valuation date (projections in exhibits A to D are to Dec. 31, 2023, and are based on more up-to-date information). We have included the most recent valuation selection (5.44%), the prior valuation assumption (3.53%) and the prior fiscal year end valuation assumption (0.76%) for comparative purposes. A 25 basis point margin for investment return adverse deviation is used in all scenarios presented.

Actuarial Present Value of Provisions at Various Discount Rates - Dec. 31, 2023 projected Unpaid								
AY	4.44%	4.94%	5.44%	5.94%	6.44%	6.94%	3.48%	3.48%
2005 & prior	-	-	-	-	-	-	-	-
2005	-	-	-	-	-	-	-	-
2006	-	-	-	-	-	-	-	-
2007	-	-	-	-	-	-	-	-
2008	-	-	-	-	-	-	-	-
2009	-	-	-	-	-	-	-	-
2010	-	-	-	-	-	-	-	-
2011	364	363	361	360	359	358	367	367
2012	14	14	14	14	14	13	14	14
2013	73	73	72	71	71	70	75	75
2014	154	153	153	152	152	151	155	155
2015	190	189	188	186	185	184	193	193
2016	404	402	399	396	393	391	410	410
2017	1,132	1,125	1,118	1,111	1,104	1,097	1,146	1,146
2018	2,092	2,074	2,056	2,039	2,022	2,005	2,128	2,128
2019	3,488	3,455	3,423	3,391	3,360	3,330	3,553	3,553
2020	3,098	3,064	3,031	2,999	2,967	2,936	3,166	3,166
2021	4,836	4,772	4,709	4,647	4,587	4,528	4,965	4,965
2022	5,972	5,886	5,802	5,720	5,640	5,562	6,144	6,144
Total	29,068	28,699	28,339	27,988	27,645	27,311	29,803	29,803
	curr - 100 bp	curr - 50 bp	curr val assumption	curr + 50bp	curr + 100bp	curr + 150bp	prior val assumption	prior fyr end assumption

Dollar Impact Relative to Valuation Assumption								
AY	4.44%	4.94%	5.44%	5.94%	6.44%	6.94%	3.48%	3.48%
Total	729	360	-	(351)	(693)	(1,027)	1,464	1,464
	curr - 100 bp	curr - 50 bp	curr val assumption	curr + 50bp	curr + 100bp	curr + 150bp	prior val assumption	prior fyr end assumption

Percentage Impact Relative to Valuation Assumption								
AY	4.44%	4.94%	5.44%	5.94%	6.44%	6.94%	3.48%	3.48%
2005 & prior	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
2005	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
2006	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
2007	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
2008	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
2009	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
2010	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
2011	0.7%	0.4%	0.0%	-0.4%	-0.7%	-1.0%	1.4%	1.4%
2012	0.1%	0.1%	0.0%	-0.1%	-0.1%	-0.2%	0.2%	0.2%
2013	1.8%	0.9%	0.0%	-0.9%	-1.8%	-2.6%	3.7%	3.7%
2014	0.8%	0.4%	0.0%	-0.4%	-0.8%	-1.2%	1.7%	1.7%
2015	1.4%	0.7%	0.0%	-0.7%	-1.4%	-2.1%	2.8%	2.8%
2016	1.4%	0.7%	0.0%	-0.7%	-1.3%	-2.0%	2.7%	2.7%
2017	1.3%	0.6%	0.0%	-0.6%	-1.2%	-1.8%	2.5%	2.5%
2018	1.7%	0.9%	0.0%	-0.8%	-1.7%	-2.5%	3.5%	3.5%
2019	1.9%	0.9%	0.0%	-0.9%	-1.8%	-2.7%	3.8%	3.8%
2020	2.2%	1.1%	0.0%	-1.1%	-2.1%	-3.1%	4.4%	4.4%
2021	2.7%	1.3%	0.0%	-1.3%	-2.6%	-3.8%	5.4%	5.4%
2022	2.9%	1.4%	0.0%	-1.4%	-2.8%	-4.1%	5.9%	5.9%
2023	3.4%	1.7%	0.0%	-1.6%	-3.2%	-4.7%	6.8%	6.8%
Total	2.6%	1.3%	0.0%	-1.2%	-2.4%	-3.6%	5.2%	5.2%
	curr - 100 bp	curr - 50 bp	curr val assumption	curr + 50bp	curr + 100bp	curr + 150bp	prior val assumption	prior fyr end assumption

EXHIBIT G

Page 1 of 2

Components of Member Statement IBNR (i.e. “Discounted”) Change

EXHIBIT G - Components of Change in M/S IBNR (i.e. IBNR + Discount Amount + Risk Adjustment): RSP Nova Scotia							
10/31/2022 to 3/31/2023							
amounts in \$000s							
Accident Year	Prior Implementation Month	Projected Change	Change Due to AvsP Variances	Change Due to Valuation Implementation	Total Change	% of Total Change	Current Month Final Amount
prior	-	-	-	-	-	-	-
2004	-	-	-	-	-	-	-
2005	-	-	-	-	-	-	-
2006	-	-	-	-	-	-	-
2007	-	-	-	-	-	-	-
2008	-	-	-	-	-	-	-
2009	5	(40)	35	6	0	8.1%	6
2010	0	-	-	-	-	-	0
2011	0	-	-	-	-	-	0
2012	0	(3)	2	1	(0)	(31.7%)	0
2013	89	(276)	169	123	16	18.1%	105
2014	63	(209)	140	85	17	26.9%	80
2015	24	(63)	36	30	3	13.9%	28
2016	3	(183)	191	8	16	512.9%	20
2017	96	(83)	(185)	0	(267)	(279.7%)	(172)
2018	721	(241)	786	(1,149)	(605)	(83.8%)	116
2019	1,208	(77)	(956)	999	(33)	(2.8%)	1,175
2020	3,659	(1,032)	832	(36)	(236)	(6.4%)	3,423
2021	11,121	(1,168)	26	(141)	(1,283)	(11.5%)	9,838
2022	8,988	(700)	1,459	(143)	617	6.9%	9,606
2023	-	653	912	45	1,610	-	1,610
<b>TOTAL</b>	<b>25,979</b>	<b>(3,421)</b>	<b>3,449</b>	<b>(171)</b>	<b>(143)</b>	<b>(0.6%)</b>	<b>25,836</b>



EXHIBIT G

Page 2 of 2

Components of IBNR (i.e. “Undiscounted”) Change

EXHIBIT G - Components of Change in Undiscounted IBNR: RSP Nova Scotia							
10/31/2022 to 3/31/2023							
amounts in \$000s							
Accident Year	Prior Implementation Month	Projected Change	Change Due to AvsP Variances	Change Due to Valuation Implementation	Total Change	% of Total Change	Current Month Final Amount
prior	-	-	-	-	-	-	-
2004	-	-	-	-	-	-	-
2005	-	-	-	-	-	-	-
2006	-	-	-	-	-	-	-
2007	(1)	-	1	-	1	(100.0%)	-
2008	(3)	-	3	-	3	(100.0%)	-
2009	5	-	(5)	-	(5)	(100.0%)	-
2010	4	-	(4)	-	(4)	(100.0%)	0
2011	4	-	(4)	-	(4)	(99.9%)	0
2012	4	0	(5)	0	(4)	(104.3%)	(0)
2013	(9)	22	(31)	8	(1)	6.8%	(10)
2014	2	39	(46)	3	(3)	(170.3%)	(1)
2015	5	(15)	8	19	12	230.4%	17
2016	(18)	(110)	139	(37)	(7)	38.9%	(25)
2017	99	(2)	(269)	(1)	(272)	(274.6%)	(173)
2018	763	(354)	871	(1,138)	(621)	(81.5%)	142
2019	1,362	(176)	(1,006)	1,097	(85)	(6.3%)	1,277
2020	4,006	(1,247)	841	106	(300)	(7.5%)	3,706
2021	12,172	(1,850)	288	116	(1,446)	(11.9%)	10,726
2022	9,777	(530)	901	(121)	250	2.6%	10,027
2023	-	791	873	96	1,759	-	1,759
<b>TOTAL</b>	<b>28,172</b>	<b>(3,432)</b>	<b>2,556</b>	<b>148</b>	<b>(728)</b>	<b>(2.6%)</b>	<b>27,444</b>