



NOVA SCOTIA RISK SHARING POOL

MAY 2019 OPERATIONAL REPORT

ACTUARIAL HIGHLIGHTS

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ACTUARIAL HIGHLIGHTS**RSP NOVA SCOTIA****OPERATIONAL REPORT****MAY 2019**

TABLE OF CONTENTS

1	Summary.....	2
1.1	Valuation Schedule (Fiscal Year 2019).....	2
1.2	New Valuation.....	2
1.3	Appointed Actuary and Hybrid Actuarial Services Model.....	4
1.4	Consideration of Recent Legal Decisions and Changes in Legislation / Regulation	4
1.5	Current Provision Summary	5
2	Activity During the Month of May 2019.....	6
2.1	Recorded Premium and Claims Activity	6
2.1.a	Actual vs. Projected (AvsP): Earned Premium.....	7
2.1.b	AvsP: Recorded Indemnity & Allowed Claims Expense	8
2.1.c	AvsP: Paid Indemnity & Allowed Claims Expense	10
2.2	Actuarial Provisions.....	12
3	Ultimate Loss Ratio Matching Method.....	14
4	Calendar Year-to-Date Results.....	14
5	Current Operational Report – Additional Exhibits	15
6	EXHIBITS	16

1 Summary

1.1 Valuation Schedule (Fiscal Year 2019)

The May 2019 Operational Report incorporates the results of an updated valuation (as at March 31, 2019) – the impact of the implementation of the valuation is discussed in section 1.2. The table immediately below summarizes the implemented valuations and future scheduled valuations for fiscal year 2019.

NOVA SCOTIA RISK SHARING POOL FISCAL YEAR 2019 – SCHEDULE OF VALUATIONS			
Valuation Date	Discount Rate (per annum)	Operational Report	Description of Changes
Sep. 30, 2018 (completed)	2.28% mfad 25 bp	Oct. 2018	updated valuation (roll forward): accident year 2018 loss ratio <u>decreased</u> 0.7 points to 92.9%; discount rate <u>increased</u> by 42 basis points; no change to selected margins for adverse deviations
Dec. 31, 2018 (completed)	1.93% mfad 25 bp	Mar. 2019	updated valuation: accident year 2019 loss ratio <u>decreased</u> 0.2 points to 96.3%; discount rate <u>decreased</u> by 35 basis points; no change to selected margins for adverse deviations
Mar. 31, 2019 (completed)	1.43% mfad 25 bp	May 2019	updated valuation (roll forward): accident year 2019 loss ratio <u>increased</u> 1.4 points to 97.7%; discount rate <u>decreased</u> by 50 basis points; no change to selected margins for adverse deviations
Jun. 30, 2019		Aug. 2019	update valuation
Sep. 30, 2019		Oct. 2019	update valuation (roll forward)

Under the proposed schedule for fiscal year 2019, the “off-half” valuation quarters ending March 31, 2019 and September 30, 2019 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 March 31, 2019 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. Additional detail will be provided in an “Actuarial Highlights – Quarterly Valuation” report which we anticipate will be posted to the FA website in July 2019.

The valuation implementation impact is summarized in the tables on the next page.

Summary of Impact (\$000s) of Implementing Result of Valuation as at March 31, 2019¹

NS	unfav / (fav) for the month and ytd					
	IMPACT in \$000s from changes in:					
	ults & payout patterns			dsct rate	margins	
	Nominal	apv adj.	sub-tot	apv adj.	apv adj.	TOTAL
	[1]	[2]	[3]	[4]	[5]	[6]
PAYs	1,180	73	1,253	464	-	1,717
CAY	172	(5)	167	138	-	305
Prem Def	172	2	174	195	-	369
TOTAL	1,524	70	1,594	797	-	2,391

As indicated in the table above, the incorporation of the new valuation had an estimated **\$2.4 million unfavourable impact** on the month's net result from operations, adding an estimated 34.2 points (see table below) to the **year-to-date Combined Operating Ratio** to end at **148.2%**.

Summary of Impact (% YTD EP) of Implementing Result of Valuation as at March 31, 2019

NS	ytd EP		6,995 (actual)			
	IMPACT unfav / (fav) as % ytd EP from changes in:					
	ults & payout patterns			dsct rate	margins	
	Nominal	apv adj.	sub-tot	apv adj.	apv adj.	TOTAL
	[1]	[2]	[3]	[4]	[5]	[6]
PAYs	16.9%	1.0%	17.9%	6.6%	-	24.5%
CAY	2.5%	(0.1%)	2.4%	2.0%	-	4.4%
Prem Def	2.5%	-	2.5%	2.8%	-	5.3%
TOTAL	21.8%	1.0%	22.8%	11.4%	-	34.2%

The impact of the nominal changes is shown in column [1] of the two preceding summary tables. The change in the selected nominal ultimates was unfavourable by \$1.5 million overall. This reflects the impact attributable to the changes in the selected ultimate loss ratios (i.e. for each accident year, it is the product of life-to-date earned premium for the accident year and the change in the selected ultimate loss ratio).

The prior accident years overall showed a \$1.2 million unfavourable nominal variance, driven by unfavourable claims development, particularly related to unfavourable physical damage reported claim experience during the quarter. This overall unfavourable prior accident years change is 3.1% of the prior accident years' nominal unpaid balance of \$38.6 million determined at the end of last month (April 2019). As a smaller pool, it is subject to higher levels of process variance, driving volatility in the ultimate selection.

The current accident year and premium deficiency impacts are a result of the changes in the selected

¹In these tables, "PAYs" refers to prior accident years, "CAY" refers to the current accident year, and "Prem Def" refers to the provision for premium deficiency or the deferred policy acquisition asset (as applicable). "Nominal" refers to changes excluding any actuarial present value adjustments, whereas "apv adj." refers to actuarial present value adjustments.

The columns under the heading "ults & payout patterns" reflect the impact of changes in the valuation selected ultimates and claims payment patterns (i.e. based on unchanged selection of discount rates and margins for adverse deviation). The column "dsct rate" reflects the impact of the change in the selected discount rate and the column "margins" reflects the impact of any changes in selected margins for adverse deviations.

loss ratios for accident year **2019** (up 1.4 points to **97.7%**) and **2020** (no change at **99.2%**). Generally, as a smaller pool, we would expect more volatility around projections of current and future expected loss ratios.

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 margins for adverse deviations or “MfADs” (at the level they were selected i.e. coverage and accident half-year), the impact of then updating the discount rate, and finally the impact of any changes to the MfADs (at the level they were selected). The changes in actuarial present value adjustments are shown in the summary tables 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 government line, which had an impact on the weighted-average MfADs). It also reflects the fact that we updated the projected emergence of claims payments, resulting in a change in the projected cash flows. These changes generated an unfavourable change of \$70 thousand in the actuarial present value adjustments, prior to any changes in the selected discount rate and/or MfADs.

Updated projected cash flows were reviewed against the selected risk-free yield curve, derived from Government of Canada benchmark bond yields monthly series using values for March 2019. Column [4] accounts for the change in the **discount rate** selected (decreased 50 basis point to **1.43%**), indicating an unfavourable impact of \$0.8 million. The impact *related only to claims liabilities* (i.e. PAYs plus CAY) was \$0.6 million at May 2019 (projected \$0.7 million impact at December 31, 2019) – this compares to the \$0.7 million change one would estimate as the impact by interpolation using the interest rate sensitivity table provided in last month’s Actuarial Highlights.

Column [5] accounts for any changes to selected MfADs. The selected **investment rate MfAD** was **left unchanged at 25 basis points** and the selected **claims development MfADs** at the coverage and accident year level were **left unchanged** as well.

Consideration was given to recent legal decisions and changes in legislation / regulation as outlined in section 1.4.

1.3 Appointed Actuary and Hybrid Actuarial Services Model

Liam McFarlane of Ernst & Young LLP is Facility Association’s Appointed Actuary (effective as of June 1, 2013).

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 / Regulation²

There have been no changes in these descriptions since last month’s 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

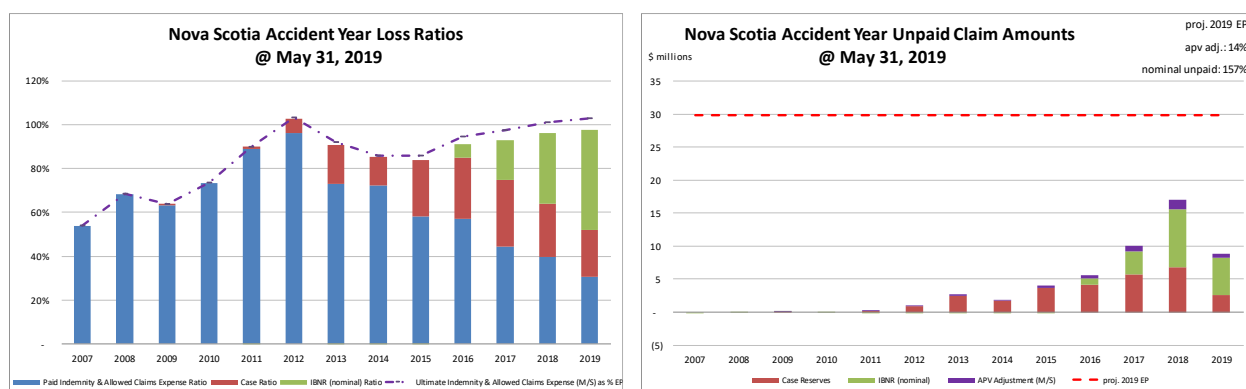
²This link is to a helpful guide on how bills become laws: <http://www.ontla.on.ca/lao/en/media/laointernet/pdf/bills-and-lawmaking-background-documents/how-bills-become-law-en.pdf>.

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.

1.5 Current Provision Summary

The charts immediately below show the current levels of claim liabilities³ 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 2019 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.

The current actuarial present value adjustments balance (\$4.1 million – see table at the top of the next page) represents 14% of the earned premium projected for the full year 2019 (see the upper right corner of the right chart above). 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.

³Claim 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.

claim liabilities (\$000s)

	amt	%
case	28,136	55.2%
ibnr	18,782	36.8%
M/S apv adjust.	4,089	8.0%
M/S total	51,007	100.0%

The table to the left breaks down the Member Statement (M/S) claim liabilities total into component parts, showing that the majority of the claim liabilities for this RSP is in case reserves. Approximately 77% of the IBNR balance relates to accident years 2018 and 2019 (see Exhibit B). Approximately 89% of the M/S total claim

liabilities are related to accident years 2015-2019 inclusive (i.e. the most recent 5 accident years) and less than 1% is related to accident years 2009 and prior (i.e. prior to the most recent 10 accident years).

The tables immediately below summarize the premium liabilities and the total policy liabilities.

premium liabilities (\$000s)

	amt	%
unearned prem	15,043	94.1%
prem def/(dpac)	(63)	(0.4%)
M/S apv adjust.	1,004	6.3%
M/S total	15,984	100.0%

policy liabilities (\$000s)

	amt	%
claim	46,918	70.0%
premium	14,980	22.4%
M/S apv adjust.	5,093	7.6%
M/S total	66,991	100.0%

2 Activity During the Month of May 2019

2.1 Recorded Premium and Claims Activity

The table immediately below summarizes the extent to which premiums and claims amounts recorded during the month differ from projections reflected in the prior month's Operational Report⁴.

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

Table 01 Accident Year	Earned Premium		Paid Indemnity & Allowed Claims Expense		Case increase / (decrease)		Recorded increase / (decrease)	
	Actual	Actual less Projected	Actual	Actual less Projected	Actual	Actual less Projected	Actual	Actual less Projected
Prior	(1)	(1)	555	414	(183)	(106)	373	309
2017	(41)	(41)	262	167	(284)	(292)	(22)	(125)
2018	(117)	(117)	97	(201)	21	(9)	118	(210)
2019	2,506	(106)	927	168	62	(367)	988	(199)
TOTAL	2,347	(266)	1,841	548	(384)	(774)	1,456	(226)

(Recorded transaction amounts exclude IBNR & other actuarial provisions)

It is typically unusual to see actual earned premium transactions affecting accident years older than the first prior accident year, the changes in 2017 and prior accident years reflect activity undertaken by a member to remove risks from the RSP, reflecting recent audit findings.

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. Commentary from

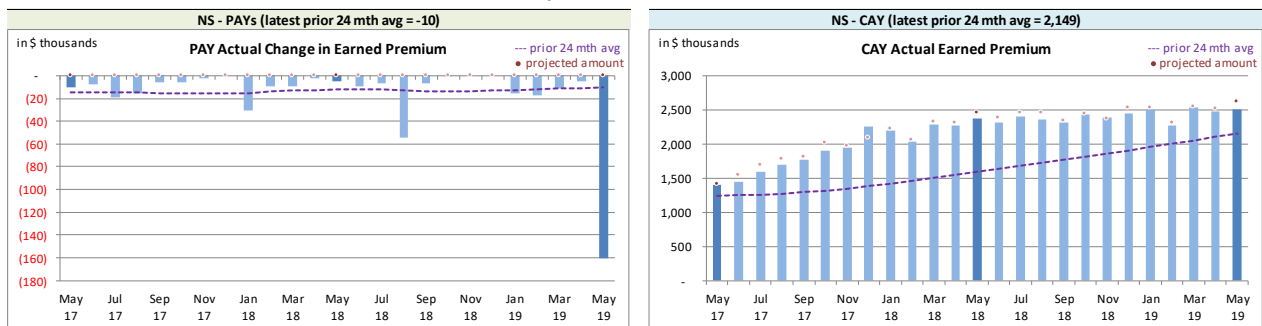
⁴There may be rounding differences in values in this document compared with the associated Bulletin and/or Operational Report.

our review is provided in the sub-sections that follow.

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

The charts immediately below show actual **earned premium**⁵ 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.

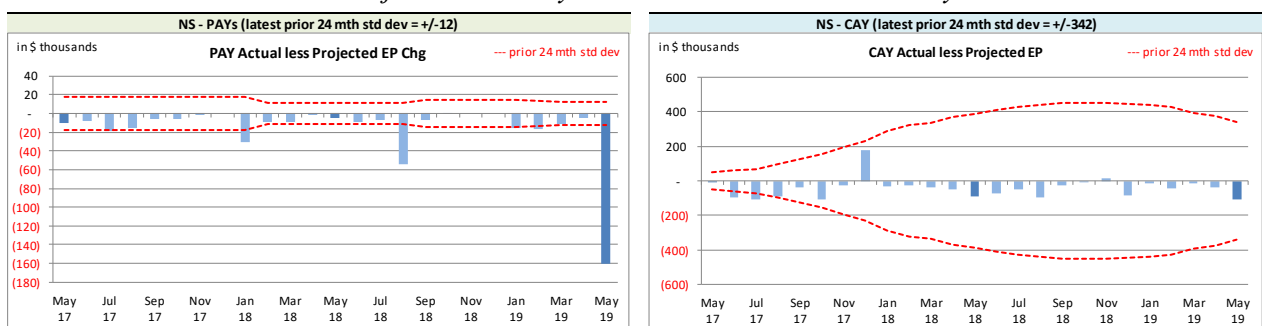
Nova Scotia RSP Actual **Earned Premium** by Calendar Month



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. As commented on earlier, this month’s variances are related to a member’s activity in relation to recent audit findings.

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



⁵Premium 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.

On Latest \$ thousands		
Earned Premium	PAYs	CAY
Mthly Avg EP Chg (prior 24 mths)	(10)	2,149
std dev	12	342
A-P <> std dev	6	2
% <> std dev	24.0%	8.0%
norm <> std dev	31.7%	31.7%

We project **earned premium** changes from known unearned premium and projected written premium levels, but upload the total projections as current accident year (CAY). This process has generated prior accident years' (PAYs) bias⁶, with actuals generally lower than projected, although the magnitude is not high relative to monthly

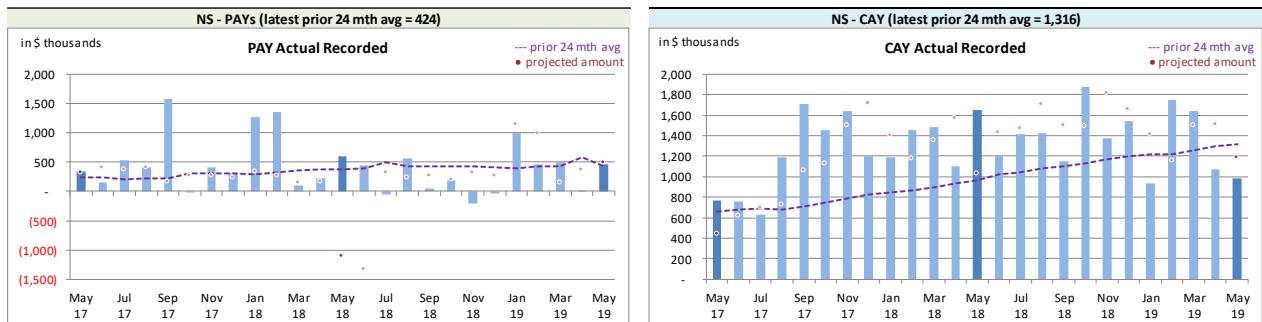
premium. In addition to the PAYs' bias, the CAY has also shown bias⁷, with actuals being generally lower than projected, and we have modified our projections processes in response. Over time, we may consider other projection approaches to narrow monthly variance levels further, but it is not currently deemed a priority.

Readers will note the significant widening of the CAY standard deviation band, reflecting volume increases and the impact as those increases are earned.

2.1.b AvsP: Recorded Indemnity & Allowed Claims Expense

The charts immediately below 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*

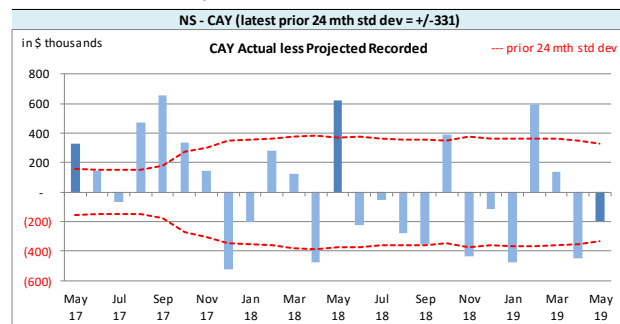
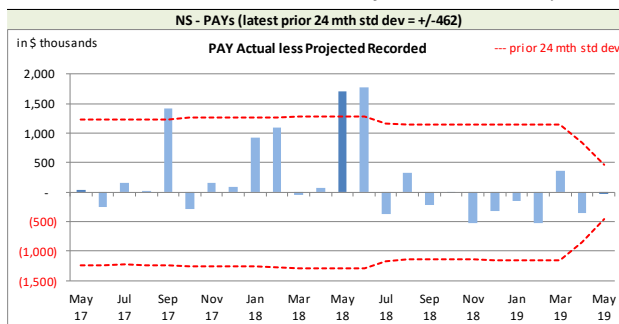


Recorded activity variances from the previous month's projections are shown in the charts at the top of the next page, including the "prior 24-month standard deviation" levels to show how the variances from projection compare with historical standard deviations.

⁶The PAYs' variances will show bias as the projection upload forces all earned premium projections to be attributed to the CAY.

⁷We measure bias based on a 95% confidence range for a binominal distribution with trials based on the range being considered (24 in this case) and 50% probability of success. The 24-month variances at May 2019 has only 2 months where the actuals were higher than projected, and as the 95% confidence range is 7 to 17, bias continues to be indicated.

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



On Latest \$ thousands			
	Recorded	PAYs	CAY
Mthly Avg Recorded (prior 24 mths)		424	1,316
std dev		462	331
A-P <> std dev		3	12
% <> std dev		12.0%	48.0%
norm <> std dev		31.7%	31.7%

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

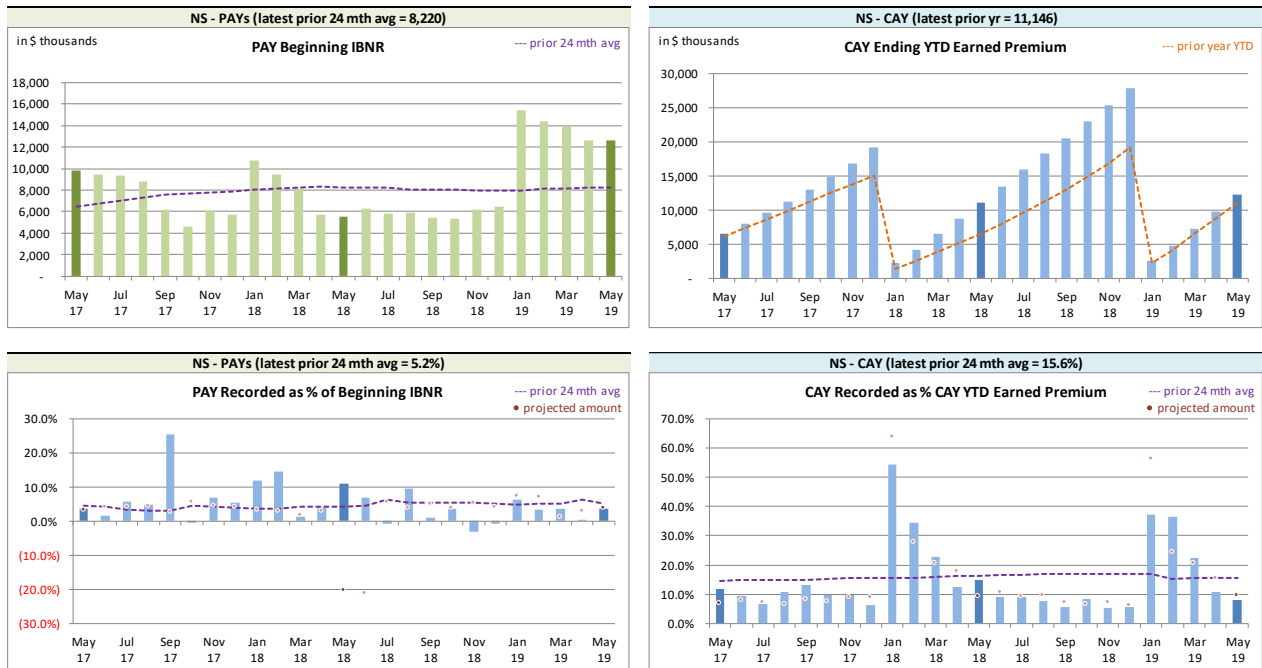
relative or overall terms. That said, 12% of prior accident years' (PAYs) **recorded** variances over the last 25 calendar months have fallen outside of one standard deviation of the actual **recorded** amounts (see table above), suggesting the projection process has performed better than simply projecting the prior 24-month average amount (assuming it follows a normal distribution). Bias has not been indicated at a 95% confidence level on a lagging 24-month basis.

The current accident year (CAY) **recorded** variances fell outside of one standard deviation 48% of the time over the last 25 calendar months (see table above), 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 (although rapid growth may be hampering our projection capabilities). Bias has not been indicated at a 95% confidence level on a lagging 24-month basis.

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, additional charts at the top of the next page related to levels influencing **recorded** activity. Note in particular the increase in the level of PAYs 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 influence⁸ Recorded activity by Calendar Month



We track beginning prior accident years' IBNR as **recorded** activity "comes out of" IBNR. Changes in the prior accident years' beginning IBNR (see left chart above) occur for several possible reasons:

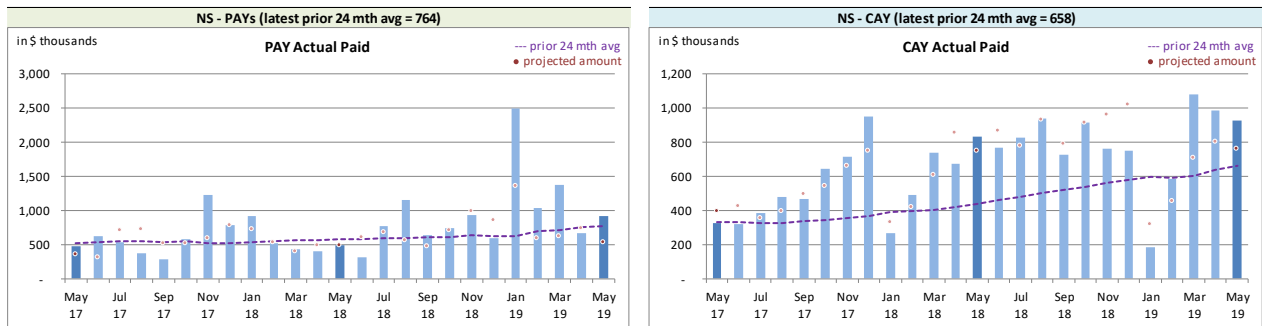
- to offset actual **recorded** activity (through loss ratio matching);
- the annual switchover as a current accident year becomes a prior accident year (occurs in January); and
- when a new valuation is implemented, where the valuation resulted in changes to the selection of prior accident years' ultimate (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 charts at the top of the next page 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.

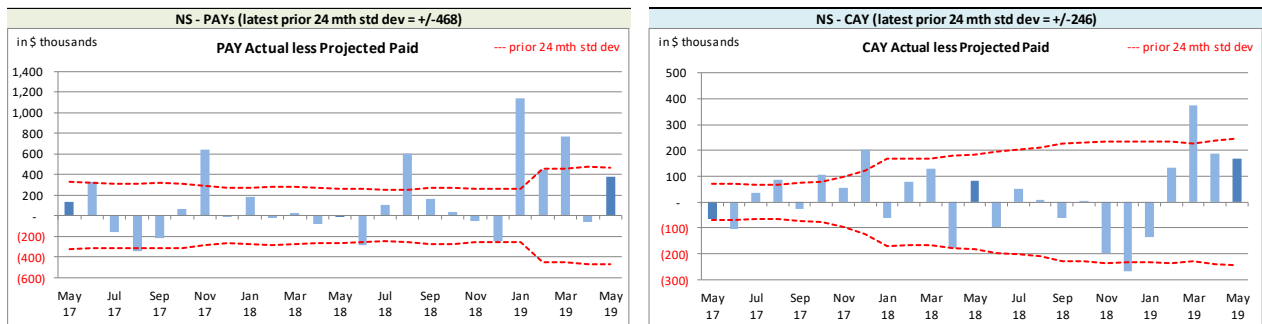
⁸Our recorded activity projections for the prior accident years are based on selected ratios of recorded activity to beginning unpaid balances, whereas the current accident year projections are based on selected ratios of year-to-date IBNR to year-to-date selected ultimate (i.e. selected LR x earned 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 charts immediately below, 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			
	Paid	PAYs	CAY
Mthly Avg Paid (prior 24 mths)		764	658
std dev		468	246
A-P <> std dev		7	6
% <> std dev		28.0%	24.0%
norm <> std dev		31.7%	31.7%

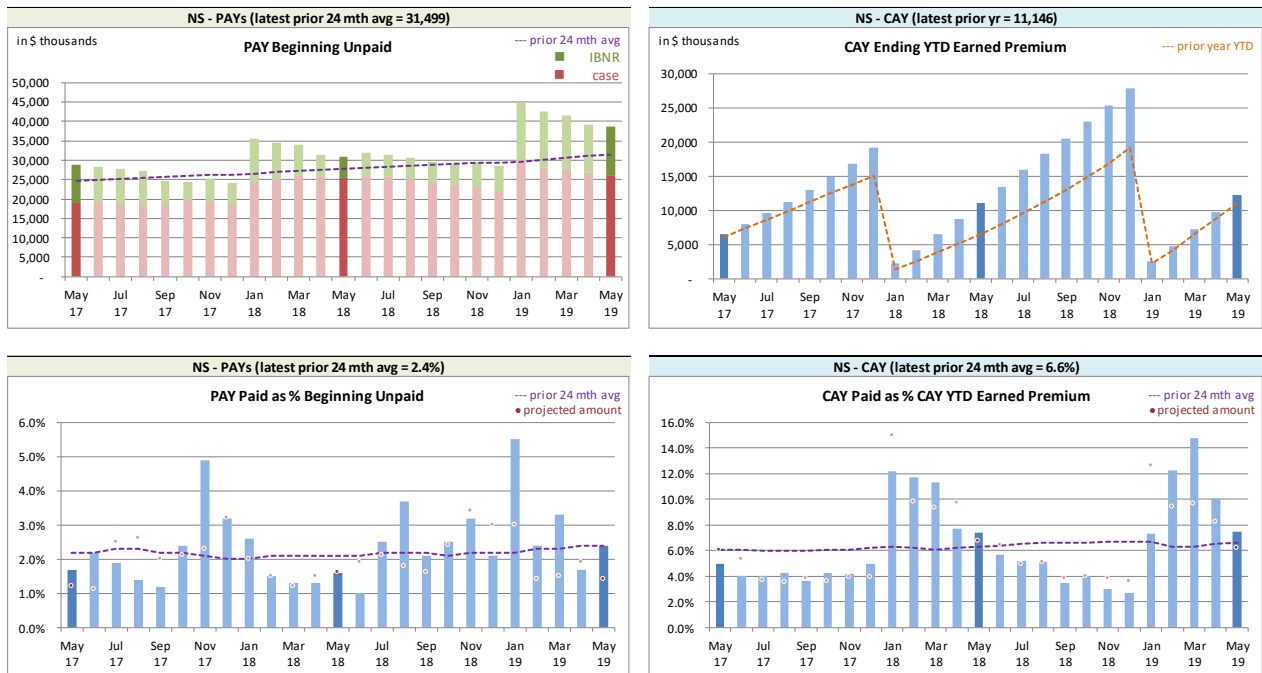
With respect to **paid** indemnity & allowed claims expense activity, caution must be exercised in reviewing the variances as this is a small pool and single claim transactions that are normal course for the business may look unusual and generate relatively significant variances that in nominal value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

overall terms. That said, 28% 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 table on left above), suggesting the projection process has performed no better 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 lagging 24-month basis.

The current accident year (CAY) **paid** variances fell outside of one standard deviation 24% of the time over the last 25 calendar months (see table above), suggesting that the projection process has performed better than simply projecting the prior 24-month average amount. No bias has been indicated at a 95% confidence level on a lagging 24-month basis.

We have included, for reference, additional charts at the top of the next page related to levels influencing **paid** activity. Both case and IBNR increases contribute to the increase of PAYs beginning unpaid. This is somewhat expected, given the maturity level of the RSP.

Nova Scotia RSP Levels that influence⁹ Paid activity by Calendar Month



We track beginning prior accident years' unpaid balance (case and IBNR) as **paid** activity “comes out of” the unpaid balance. Changes in the prior accident years' beginning unpaid balance (see upper left chart above) occur for several possible reasons:

- to offset actual **paid** activity (may reduce case or IBNR or both);
- the annual switchover as a current accident year becomes a prior accident year (occurs in January); and
- when a new valuation is implemented, where the valuation resulted in changes to the selection of prior accident years' ultimate (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 IBNR¹⁰, 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 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. The table at the top of the next page summarizes variances in provisions included in this month's Operational Report and the

⁹Our 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.

¹⁰For ease of discussion, “IBNR” is used in place of “provisions for incurred but not recorded (IBNR) and development”.

associated one-month projections from last month's Report.

Nova Scotia RSP Actual vs Projected Summary: IBNR and APV Amounts (\$ thousands)

Table 02

Accident Year	IBNR		actuarial present value adjustments				IBNR + actuarial present value adjustments	
			Discount Amount		Provisions for Adverse Deviations			
	Actual	Actual less Projected	Actual	Actual less Projected	Actual	Actual less Projected	Actual	Actual less Projected
Prior	813	(99)	(327)	110	1,598	(13)	2,084	(2)
2017	3,468	143	(304)	99	1,143	2	4,307	244
2018	8,875	1,013	(610)	136	1,956	161	10,221	1,310
2019	5,626	268	(363)	129	996	(13)	6,259	384
TOTAL	18,782	1,325	(1,604)	474	5,693	137	22,871	1,936

The IBNR provision is \$1.3 million higher than projected from last month, counterbalancing the recorded claims activity and adjusting for the earned premium variance impacts indicated in section 2.1, and due to the valuation implementation.

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)

The variances associated with (ii) above are discussed in sections 2.1.a and 2.1.b.

The table at the top of the next page summarizes the variances in the provisions for premium deficiency liability / (deferred policy acquisition cost asset) included this month's Operational Report and the one-month projections from last month's Report. This RSP is in a deferred policy acquisition cost asset position (shown as a negative value) prior to actuarial present value adjustments and in a premium deficiency position (shown as a positive value) after actuarial present value adjustments. Actuarial present value adjustments increase the liability value as the adjustments increase the expected future policy obligations (costs) associated with the unearned premium. The variances noted are mainly driven by the unearned premium variance, and due to the valuation implementation.

Nova Scotia RSP Actual vs Projected Summary: Premium Deficiency / (DPAC) Amounts (\$ thousands)

Table 03

	Premium Deficiency / (Deferred Policy Acquisition Costs)		actuarial present value adjustments		Premium Deficiency / (DPAC) including actuarial present value adjustments	
	Actual	Actual less Projected	Actual	Actual less Projected	Actual	Actual less Projected
balance:	(63)	176	1,004	192	941	368
balance as % unearned premium:	(0.4%)	1.2%	6.7%	1.3%	6.3%	2.5%
actual unearned premium:	15,043					
less projected:	(109)					

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 loss¹¹ 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 table at the top of the next page summarizes the calendar year-to-date results for indemnity & allowed claims expenses¹², 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 99.4% rather than 97.7% (the valuation ultimate ratio for accident year 2019), 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.)

¹¹“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).

¹²Allowed 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)

Table 04	YTD Nominal Values		YTD actuarial present value adjustment		YTD Total		Change from Prior Month YTD	
	Amount	% EP	Amount	% EP	Amount	% EP	Amount	LR pts
PAYs	160	1.3%	713	5.9%	873	7.2%	1,482	13.5%
CAY	12,002	99.4%	633	5.2%	12,635	104.6%	2,811	3.6%
TOTAL	12,162	100.7%	1,346	11.1%	13,508	111.9%	4,293	17.2%

("% EP" based on 2019 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 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 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).

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 Premium Liabilities
- EXHIBIT D Projected Year-end Policy Liabilities
- EXHIBIT E Discount Rate & Margins for Adverse Deviations
- EXHIBIT F Interest Rate Sensitivity
- EXHIBIT G Components of IBNR Change During Month

EXHIBIT A

IBNR for Member Sharing – includes Actuarial Present Value Adjustments

TABLE EXHIBIT A

 IBNR + M/S actuarial present
 value adjustments

 discount rate
 1.43%

 interest rate margin
 25 basis pts

Amounts in \$000s					
Accident Year	Actual Apr. 2019	Actual May. 2019	Projected Jun. 2019	Projected Jul. 2019	Projected Dec. 2019
2007	(1)	(1)	(1)	(1)	(1)
2008	2	2	2	2	2
2009	10	10	10	10	8
2010	4	4	4	4	4
2011	17	(23)	(23)	(23)	(20)
2012	121	61	61	58	56
2013	185	182	179	173	163
2014	20	98	96	90	87
2015	428	316	309	306	254
2016	1,378	1,435	1,377	1,333	1,137
2017	4,173	4,307	4,151	4,001	3,288
2018	9,261	10,221	9,854	9,486	8,144
2019	4,436	6,259	7,717	8,971	12,111
TOTAL	20,034	22,871	23,736	24,410	25,233
Change		2,837	865	674	

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

EXHIBIT B
IBNR
TABLE EXHIBIT B

TABLE EXHIBIT B		Amounts in \$000s					
IBNR	Ultimate Loss Ratio	Accident Year	Actual Apr. 2019	Actual May. 2019	Projected Jun. 2019	Projected Jul. 2019	Projected Dec. 2019
	53.9%	2007	(1)	(1)	(1)	(1)	(1)
	68.3%	2008	2	2	2	2	2
	63.8%	2009	5	5	5	5	4
	73.4%	2010	4	4	4	4	4
	89.9%	2011	5	(32)	(32)	(32)	(28)
	102.8%	2012	60	(5)	(5)	(5)	(4)
	90.6%	2013	10	(11)	(11)	(11)	(10)
	85.0%	2014	(90)	(39)	(39)	(39)	(34)
	83.5%	2015	82	(42)	(40)	(38)	(29)
	91.2%	2016	899	932	885	850	706
	93.0%	2017	3,428	3,468	3,329	3,196	2,575
	96.3%	2018	8,190	8,875	8,520	8,179	6,950
	97.7%	2019	4,028	5,626	6,960	8,076	10,618
		TOTAL	16,622	18,782	19,577	20,186	20,753
	Change		2,160	795	609		

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

EXHIBIT C
Premium Liabilities
TABLE EXHIBIT C

	Amounts in \$000s				
	Actual Apr. 2019	Actual May. 2019	Projected Jun. 2019	Projected Jul. 2019	Projected Dec. 2019
Premium Liabilities					
(1) unearned premium (UP)	14,797	15,043	15,481	15,819	15,968
FOR MEMBER SHARING					
(2) expected future costs ratio {% of (1)}	103.6%	106.3%	106.4%	106.5%	107.6%
(3) expected future costs {(1) x (2)}	15,323	15,984	16,469	16,853	17,177
(4) premium deficiency / (deferred policy acquisition cost)	526	941	988	1,034	1,209
Excluding Actuarial Present Value Adjustments					
(5) expected future costs ratio {% of (1)}	98.2%	99.6%	99.7%	99.8%	100.8%
(6) expected future costs {(1) x (5)}	14,533	14,980	15,433	15,794	16,096
(7) premium deficiency / (deferred policy acquisition cost)	(264)	(63)	(48)	(25)	128

EXHIBIT D

Projected Year-end Policy Liabilities

The table below presents the projected policy liabilities as at December 31, 2019, broken down by component.

Nova Scotia ending 2019		Projected Balances as at Dec. 31, 2019 (\$000s)							
Acc Yr	nominal values			actuarial present value adjustments (apvs)					
	Case	IBNR	Total Unpaid	discount	investment PfAD	nominal development PfAD	development PfAD discount	development PfAD	Total apvs
2007	-	(1)	(1)	-	-	-	-	-	(1)
2008	-	2	2	-	-	-	-	-	2
2009	60	4	64	(2)	-	6	-	6	68
2010	-	4	4	-	-	-	-	-	4
2011	138	(28)	110	(4)	1	11	-	11	118
2012	773	(4)	769	(18)	3	77	(2)	75	829
2013	2,199	(10)	2,189	(50)	9	219	(5)	214	2,362
2014	1,519	(34)	1,485	(30)	6	148	(3)	145	1,606
2015	2,855	(29)	2,826	(62)	11	342	(8)	334	3,109
2016	3,662	706	4,368	(114)	17	542	(14)	528	4,799
2017	5,266	2,575	7,841	(259)	47	957	(32)	925	8,554
2018	6,898	6,950	13,848	(540)	97	1,703	(66)	1,637	15,042
PAYs (sub-total):	23,370	10,135	33,505	(1,079)	191	4,005	(130)	3,875	36,492
CAY (2019)	8,848	10,618	19,466	(857)	136	2,316	(102)	2,214	20,959
claims liabilities:	32,218	20,753	52,971	(1,936)	327	6,321	(232)	6,089	57,451
	Unearned Premium	Premium Deficiency / (DPAC)	Total Provision	discount	investment PfAD	nominal development PfAD	development PfAD discount	development PfAD	Total apvs
									TOTAL*
premium liabilities:	15,968	128	16,096	(586)	95	1,632	(60)	1,572	17,177
*Total may not be sum of parts, as apvs apply to future costs within UPR									
policy liabilities:			69,067	(2,522)	422	7,953	(292)	7,661	74,628

EXHIBIT E

Discount Rate & Margins for Adverse Deviations

The tables below present selected margins for adverse development by coverage (the total is a weighted average, based on the unpaid claims projection for December 31, 2019 from the valuation), followed by the selected discount rate and the associated margin for investment income.

Selected Claims Development MfADs (Mar. 31, 2019)

Accident Year	Third Party Liability Margins	Accident Benefits Margins	Other Coverages Margins	Total Margins
2007	10.0%	10.0%	10.0%	10.0%
2008	10.0%	10.0%	10.0%	10.0%
2009	10.0%	10.0%	10.0%	10.0%
2010	10.0%	10.0%	10.0%	10.0%
2011	10.0%	10.0%	10.0%	10.0%
2012	10.0%	10.0%	10.0%	10.0%
2013	10.0%	10.0%	10.0%	10.0%
2014	10.0%	10.0%	10.0%	10.0%
2015	12.5%	10.0%	12.0%	12.1%
2016	12.5%	10.0%	12.5%	12.4%
2017	12.5%	10.0%	9.4%	12.2%
2018	12.5%	10.0%	9.8%	12.3%
2019	12.4%	10.0%	5.7%	11.9%
2020	12.0%	10.0%	5.1%	10.3%
prem liab	12.0%	10.0%	5.1%	10.3%

discount rate: 1.43%
margin (basis points): 25

EXHIBIT F

Interest Rate Sensitivity

The tables below present sensitivity to the member statement claims liability as projected to Dec. 31, 2019 from the latest valuation date (projections in exhibits A to D are to Dec. 31, 2019, and are based on more up-to-date information). We have included the most recent valuation selection (1.43%), the prior valuation assumption (1.93%) and the prior fiscal year end valuation assumption (2.28%) for comparative purposes. A 25 basis point margin for investment return adverse deviation is used in all scenarios presented.

\$ Format: \$000s

AY	Actuarial Present Value of Provisions at Various Discount Rates - Dec. 31, 2019 projected Unpaid							
	0.43%	0.93%	1.43%	1.93%	2.43%	2.93%	1.93%	2.28%
2007	-	-	-	-	-	-	-	-
2008	-	-	-	-	-	-	-	-
2009	53	52	52	51	51	51	51	51
2010	-	-	-	-	-	-	-	-
2011	144	143	141	139	137	136	139	138
2012	611	606	601	596	591	586	596	592
2013	1,359	1,348	1,337	1,327	1,317	1,307	1,327	1,320
2014	1,026	1,019	1,012	1,005	998	992	1,005	1,000
2015	3,194	3,170	3,146	3,123	3,100	3,078	3,123	3,107
2016	5,273	5,224	5,176	5,129	5,082	5,037	5,129	5,096
2017	9,213	9,107	9,002	8,900	8,800	8,703	8,900	8,830
2018	15,931	15,709	15,494	15,285	15,078	14,879	15,285	15,139
2019	22,132	21,782	21,443	21,113	20,790	20,478	21,113	20,885
Total	58,936	58,160	57,404	56,668	55,944	55,247	56,668	56,158
	curr - 100 bp	curr - 50 bp	curr val assumption	curr + 50bp	curr + 100bp	curr + 150bp	prior val assumption	prior fyr end assumption

AY	Dollar Impact Relative to Valuation Assumption							
	0.43%	0.93%	1.43%	1.93%	2.43%	2.93%	1.93%	2.28%
Total	1,532	756	-	(736)	(1,460)	(2,157)	(736)	(1,246)
	curr - 100 bp	curr - 50 bp	curr val assumption	curr + 50bp	curr + 100bp	curr + 150bp	prior val assumption	prior fyr end assumption

AY	Percentage Impact Relative to Valuation Assumption							
	0.43%	0.93%	1.43%	1.93%	2.43%	2.93%	1.93%	2.28%
2007	-	-	-	-	-	-	-	-
2008	-	-	-	-	-	-	-	-
2009	1.9%	-	-	(1.9%)	(1.9%)	(1.9%)	(1.9%)	(1.9%)
2010	-	-	-	-	-	-	-	-
2011	2.1%	1.4%	-	(1.4%)	(2.8%)	(3.5%)	(1.4%)	(2.1%)
2012	1.7%	0.8%	-	(0.8%)	(1.7%)	(2.5%)	(0.8%)	(1.5%)
2013	1.6%	0.8%	-	(0.7%)	(1.5%)	(2.2%)	(0.7%)	(1.3%)
2014	1.4%	0.7%	-	(0.7%)	(1.4%)	(2.0%)	(0.7%)	(1.2%)
2015	1.5%	0.8%	-	(0.7%)	(1.5%)	(2.2%)	(0.7%)	(1.2%)
2016	1.9%	0.9%	-	(0.9%)	(1.8%)	(2.7%)	(0.9%)	(1.5%)
2017	2.3%	1.2%	-	(1.1%)	(2.2%)	(3.3%)	(1.1%)	(1.9%)
2018	2.8%	1.4%	-	(1.3%)	(2.7%)	(4.0%)	(1.3%)	(2.3%)
2019	3.2%	1.6%	-	(1.5%)	(3.0%)	(4.5%)	(1.5%)	(2.6%)
Total	2.7%	1.3%	-	(1.3%)	(2.5%)	(3.8%)	(1.3%)	(2.2%)
	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 During Month

RSP Nova Scotia
AccountCode Desc IBNR - Discounted

M/S IBNR - in \$000s

AccYear	Values				Sum of Total Change	Sum of % Total Change	Sum of Current Month Final Amount
	Sum of Prior Month Actual Amount	Sum of Projected Change	Sum of Change Due to AvsP Variances	Sum of Change Due to Valuation Implementation			
2007	(1)	-	-	-	-	-	(1)
2008	2	-	-	-	-	-	2
2009	10	-	-	-	-	-	10
2010	4	-	-	-	-	-	4
2011	17	-	(2)	(38)	(40)	(235.3%)	(23)
2012	121	(1)	3	(62)	(60)	(49.6%)	61
2013	185	(3)	(18)	18	(3)	(1.6%)	182
2014	20	-	(172)	250	78	390.0%	98
2015	428	(4)	(115)	7	(112)	(26.2%)	316
2016	1,378	(70)	(38)	165	57	4.1%	1,435
2017	4,173	(110)	70	174	134	3.2%	4,307
2018	9,261	(350)	107	1,203	960	10.4%	10,221
2019	4,436	1,439	79	305	1,823	41.1%	6,259
Grand Total	20,034	901	(86)	2,022	2,837	14.2%	22,871

EXHIBIT G

Page 2 of 2

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

RSP Nova Scotia
AccountCode Desc IBNR - Undiscounted

IBNR - in \$000s

AccYear	Values				Sum of Total Change	Sum of % Total Change	Sum of Current Month Final Amount
	Sum of Prior Month Actual Amount	Sum of Projected Change	Sum of Change Due to AvsP Variances	Sum of Change Due to Valuation Implementation			
2007	(1)	-	-	-	-	-	(1)
2008	2	-	-	-	-	-	2
2009	5	-	-	-	-	-	5
2010	4	-	-	-	-	-	4
2011	5	-	-	(37)	(37)	(740.0%)	(32)
2012	60	(1)	2	(66)	(65)	(108.3%)	(5)
2013	10	-	(21)	-	(21)	(210.0%)	(11)
2014	(90)	1	(174)	224	51	(56.7%)	(39)
2015	82	(1)	(109)	(14)	(124)	(151.2%)	(42)
2016	899	(63)	(8)	104	33	3.7%	932
2017	3,428	(103)	86	57	40	1.2%	3,468
2018	8,190	(328)	101	912	685	8.4%	8,875
2019	4,028	1,330	96	172	1,598	39.7%	5,626
Grand Total	16,622	835	(27)	1,352	2,160	13.0%	18,782