



**NOVA SCOTIA RISK SHARING POOL**

**APRIL 2020 OPERATIONAL REPORT**

**ACTUARIAL HIGHLIGHTS**

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**ACTUARIAL HIGHLIGHTS**

**RSP NOVA SCOTIA**

**OPERATIONAL REPORT**

**APRIL 2020**

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## 1 Summary

### Key Points

- (a) The loss ratios being used under our current assumptions do NOT include any incurred impacts of adjustments related to COVID-19; any associated impacts and changes will be initially reflected in our March 31, 2020 valuation which will be implemented in the May 2020 Operational Reports; and
- (b) The month’s Current Accident Year recorded activities were lower than the projections from last month; the activity was reviewed and attributed to a reduction in written premium and physical damage claims experience in the month due to the impact of the COVID-19 pandemic. April’s reported claims projections for the next two months (May 2020 and June 2020) have been adjusted to reflect the impacts: a 30% decrease in Current Accident Year physical damage claim activity, as per discussion with FA’s Appointed Actuary. No adjustment has been made to this month’s premium projections.

### 1.1 Valuation Schedule (Fiscal Year 2020)

The April 2020 Operational Report leverages actuarial assumptions consistent with last month (that is, it does not reflect the results of an updated valuation). The table below summarizes the valuation implementations scheduled for fiscal year 2020.

<b>NOVA SCOTIA RISK SHARING POOL FISCAL YEAR 2020 – SCHEDULE OF VALUATIONS</b>			
<b>Valuation Date</b>	<b>Discount Rate (per annum)</b>	<b>Operational Report</b>	<b>Description of Changes</b>
Sep. 30, 2019 (completed)	1.46% mfad 25 bp	Oct. 2019	updated valuation (roll forward) : accident year 2019 loss ratio <u>increased</u> 1.0 points to 97.8%; discount rate <u>increased</u> 5 basis points; no change to selected margins for adverse deviations
Dec. 31, 2019	1.64% mfad 25 bp	Mar. 2020	update valuation: 2019 loss ratio <u>increased</u> 2.7 points to 100.5%; accident year 2020 loss ratio <u>increased</u> 4.5 points to 103.1%; discount rate <u>increased</u> 18 basis points; no change to selected margins for adverse deviations
Mar. 31, 2020	% mfad -- bp	May 2020	update valuation (partial roll-forward)
Jun. 30, 2020	% mfad -- bp	Aug. 2020	update valuation
Sep 30, 2020	% mfad -- bp	Oct. 2020	update valuation (roll-forward)

Under the proposed schedule for fiscal year 2020, the off-half valuation quarters ending March 31, 2020 and September 30, 2020 would not reflect a full valuation update of assumptions, but would rather roll-forward key assumptions from the previous valuation. However, with disruption on

the insurance environment from the COVID-19 pandemic, the valuation quarter ending March 31, 2020 will include partial update of key assumptions to reflect this impact. Other assumptions will continue and be roll-forward from the previous valuation.

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

Mr. Cosimo Pantaleo of Ernst & Young LLP (EY) was appointed as Actuary by the FA Board at its February 18, 2020 meeting.

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.

## **1.3 Consideration of Recent Legal Decisions and Changes in Legislation / Regulation<sup>1</sup>**

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 (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.

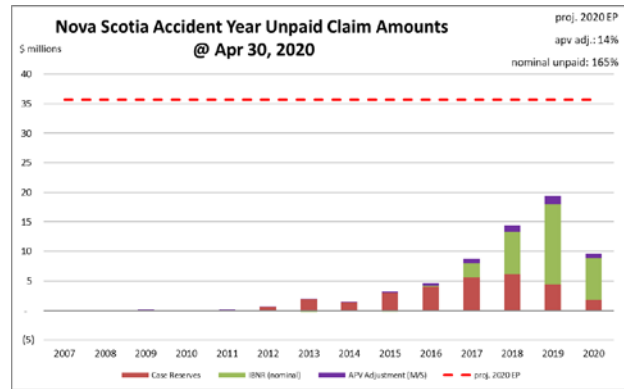
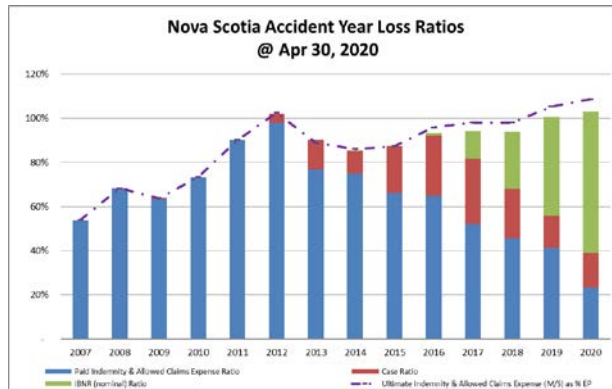
## **1.4 Current Provision Summary**

The following charts show the current levels of claim liabilities<sup>2</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 2020 full year earned premium (the red hash-mark line) to provide some perspective.

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<sup>1</sup>This url to a pdf is to a helpful guide on how bills become laws: <https://www.ola.org/sites/default/files/common/how-bills-become-law-en.pdf>.

<sup>2</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.



“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 (\$4.8 million – see the following table) represents 14% of the earned premium projected for the full year 2020 (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.

claim liabilities (\$000s)

	amt	%
case	28,795	45.3%
ibnr	29,931	47.1%
M/S apv adjust.	4,833	7.6%
<b>M/S total</b>	<b>63,559</b>	<b>100.0%</b>

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 69% of the IBNR balance relates to accident years 2019 and 2020 (see Exhibit B). Approximately 89% of the M/S total claim

liabilities are related to accident years 2016-2020 inclusive (i.e. the most recent 5 accident years), and just over 0% is related to accident years 2010 and prior (i.e. prior to the most recent 10 accident years).

The following tables summarize the premium liabilities and the total policy liabilities.

premium liabilities (\$000s)

	amt	%
unearned prem	16,776	89.8%
prem def/(dpac)	807	4.3%
M/S apv adjust.	1,096	5.9%
<b>M/S total</b>	<b>18,679</b>	<b>100.0%</b>

policy liabilities (\$000s)

	amt	%
claim	58,726	71.4%
premium	17,583	21.4%
M/S apv adjust.	5,929	7.2%
<b>M/S total</b>	<b>82,238</b>	<b>100.0%</b>

## 2 Activity During the Month of April 2020

### 2.1 Recorded Premium and Claims Activity

The following table summarizes the extent to which premiums and claims amounts recorded during the month differ from projections reflected in the prior month’s Operational Report<sup>3</sup>.

<sup>3</sup>There may be rounding differences in values in this document compared with the associated Bulletin and/or Operational Report.

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

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	0	0	90	(128)	218	410	308	282
2018	(5)	(5)	157	23	(2)	(87)	155	(64)
2019	(19)	(19)	220	(144)	(275)	(318)	(55)	(462)
2020	2,786	(121)	670	(191)	(222)	(706)	448	(896)
TOTAL	2,763	(145)	1,137	(440)	(282)	(701)	855	(1,141)

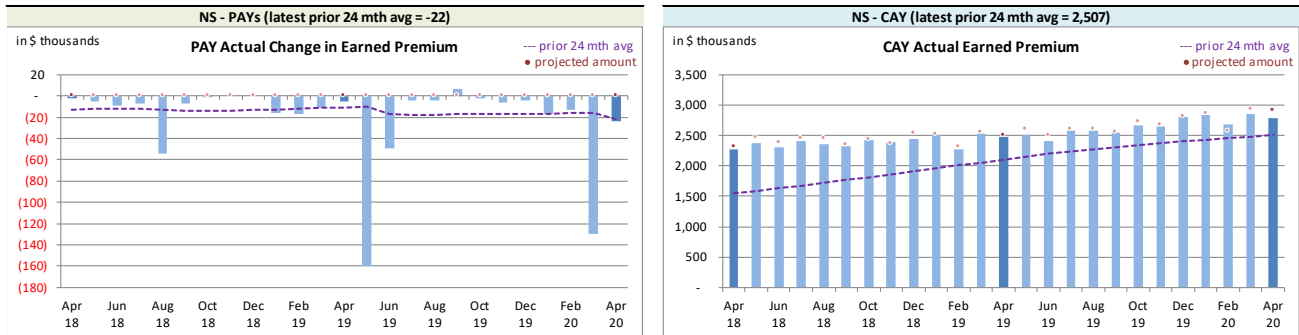
(Recorded transaction amounts exclude IBNR & other actuarial provisions)

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

**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.

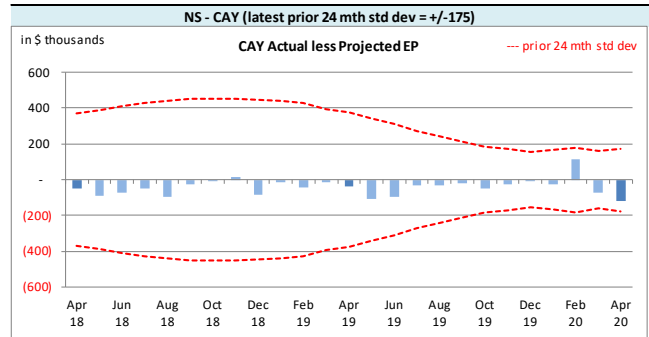
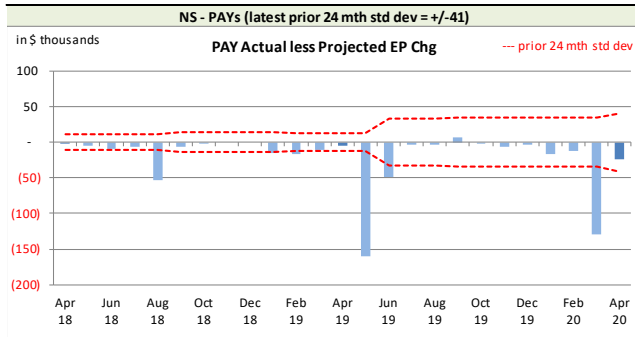
**Nova Scotia RSP Actual Earned Premium by Calendar Month**



**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.

<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.

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


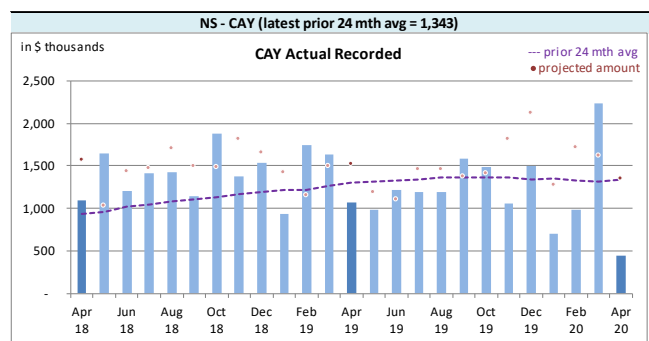
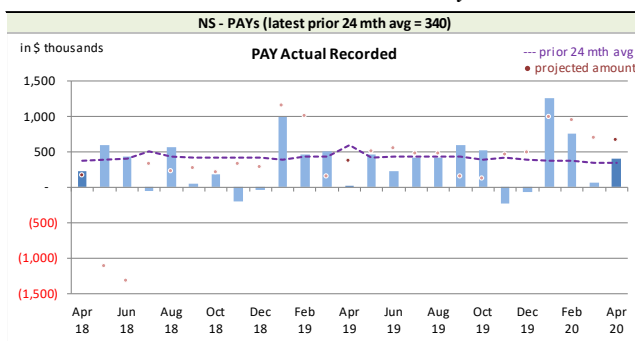
On Latest \$ thousands		
Earned Premium	PAYS	CAY
Mthly Avg EP Chg (prior 24 mths)	(22)	2,507
std dev	41	175
A-P <> std dev	6	-
% <> std dev	24.0%	0.0%
norm <> std dev	31.7%	31.7%
performance vs 24-mth avg:	better	better

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 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. With the March 2020 projections we adjusted our written premium projection process and how we project earned premium from written premium projections with a goal of narrowing monthly variances and addressing the bias issue.

**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*


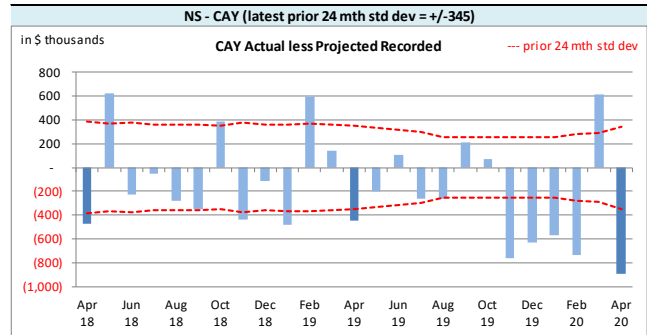
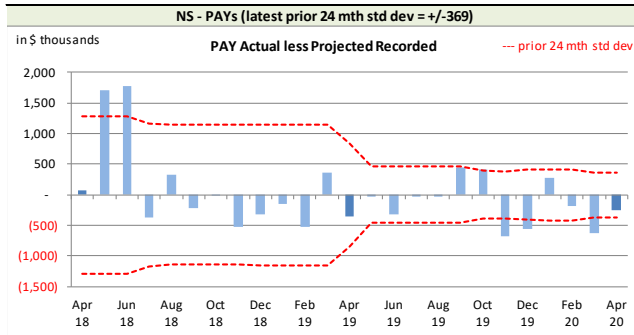
**Recorded** activity variances from the previous month's projections are shown in the following charts, including the “prior 24-month standard deviation” levels to show how the variances from projection

<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 April 2020 has only 2 months where the actuals were higher than projected, and as the 95% confidence range is 8 to 17, bias continues to be indicated.

compare with historical standard deviations.

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



On Latest \$ thousands		
<b>Recorded</b>	PAYs	CAY
Mthly Avg Recorded (prior 24 mths)	340	1,343
std dev	369	345
A-P <> std dev	6	14
% <> std dev	24.0%	56.0%
norm <> std dev	31.7%	31.7%
performance vs 24-mth avg:	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, 24% 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 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 rolling 25-month basis (8 of 25 variances are positive).

The current accident year (CAY) **recorded** variances fell outside of one standard deviation 56% 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 rolling 25-month basis (8 of 25 variances are positive).

The CAY **recorded** variance was outside of the one standard deviation band this month (see preceding chart on the right). The significant lower than projected recorded activity was reviewed, and attributed to a reduction in written premium and physical damage claims experience in the month; this is consistent with discussion with FA's Appointed Actuary in relation to the COVID-19 pandemic impact. An adjustment has been made to projected CAY recorded claims activity for the next two projection months (May-June 2020).

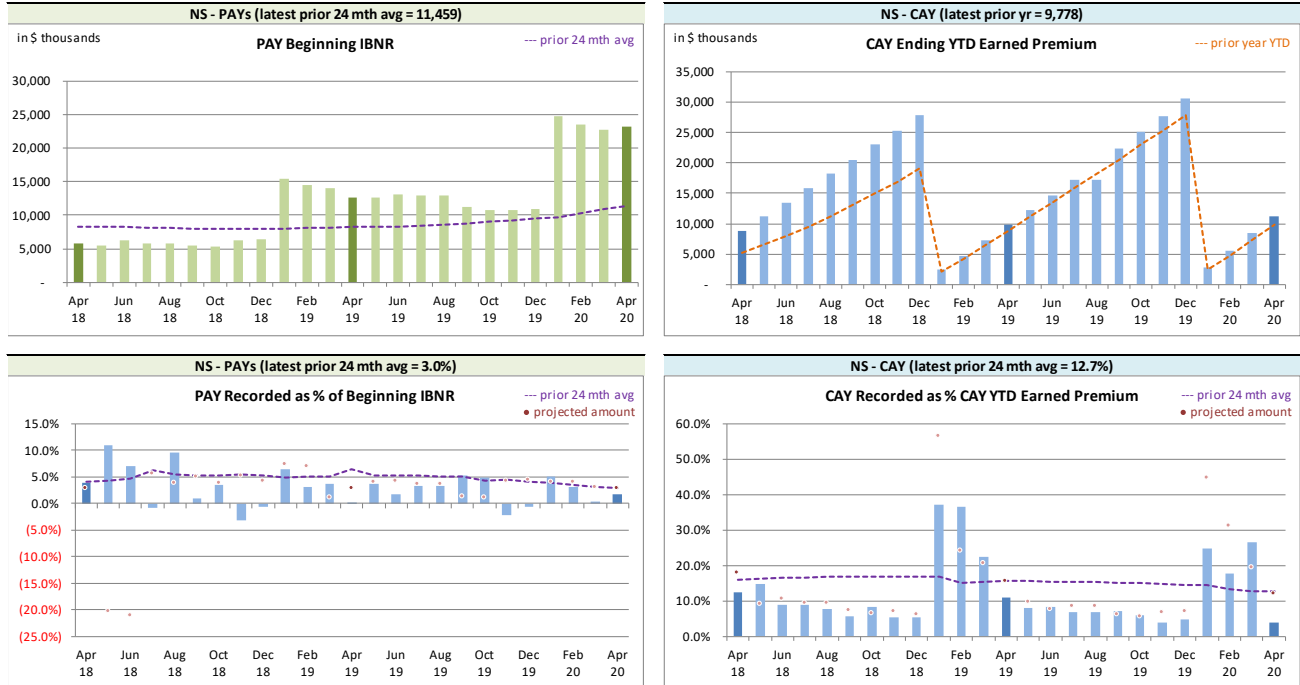
The method for establishing IBNR adjusts automatically for changes in **earned premium** and **recorded** claims activity level (see sections 2.2 and 3).

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*



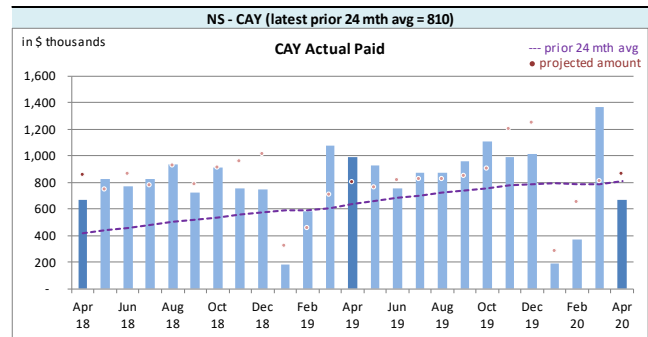
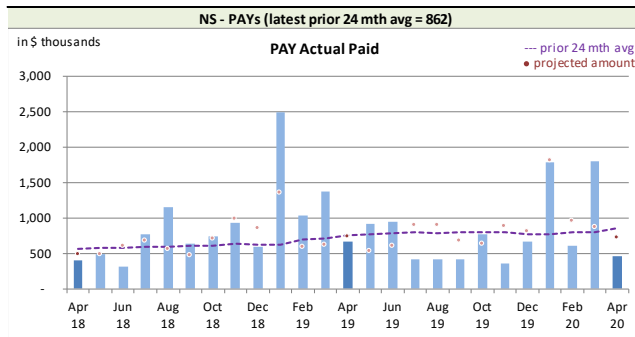
We track PAY beginning IBNR as **recorded** activity comes out of IBNR. Changes in the PAY beginning IBNR (see left chart above) occur for several possible reasons:

- 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).

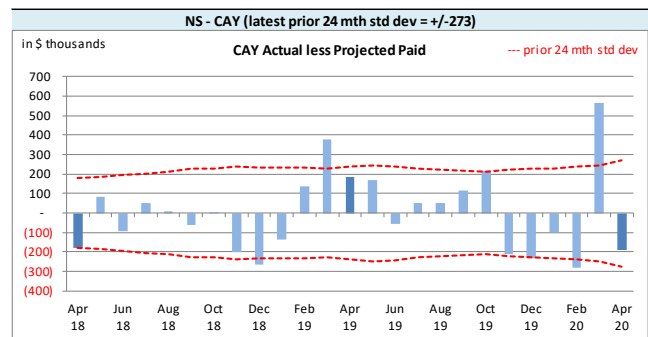
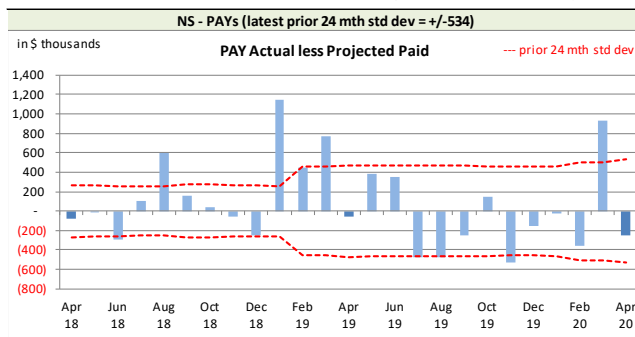
**2.1.c AvsP: Paid Indemnity & Allowed Claims Expense**

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)	862	810
std dev	534	273
A-P <> std dev	8	6
% <> std dev	32.0%	24.0%
norm <> std dev	31.7%	31.7%
performance vs 24-mth avg:	no better	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 table on 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 rolling 25-month basis (11 of 25 variances are positive).

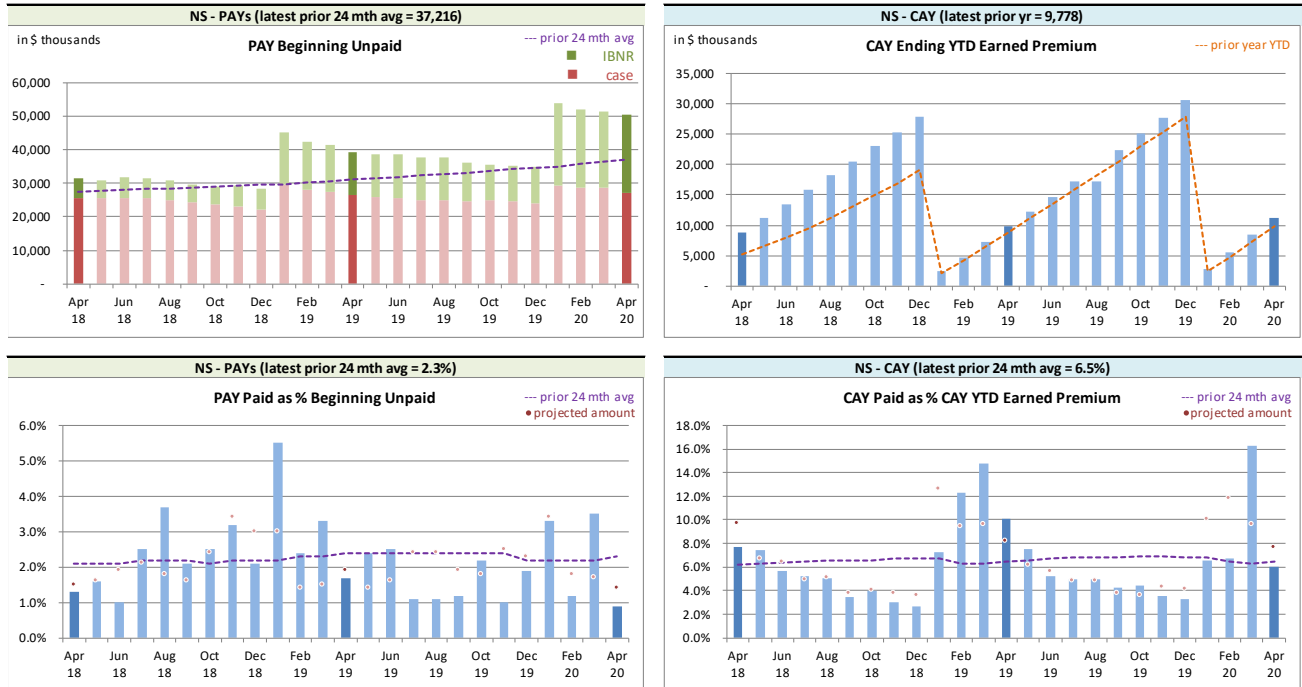
The current accident year (CAY) **paid** variances fell outside of one standard deviation 24% of the time over the last 25 calendar months (see the preceding table), suggesting that the projection process has performed better than simply projecting the prior 24-month average amount. Bias has not been indicated at a 95% confidence level on a rolling 25-month basis (13 of 25 variances are positive).

As discussed with respect to CAY recorded claims activity in relation to the COVID-19 pandemic impact, an adjustment has been made to projected CAY paid claims activity for the next two projection

months (May-June 2020).

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 chart above) 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

<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 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 following table summarizes variances in provisions included in this month’s Operational Report and the associated one-month projections from last month’s Report.

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

Table 02		actuarial present value adjustments							
		IBNR		Discount Amount		Provisions for Adverse Deviations		IBNR + actuarial present value adjustments	
Accident Year	Actual	Actual less Projected	Actual	Actual less Projected	Actual	Actual less Projected	Actual	Actual less Projected	
Prior	2,039	(282)	(533)	(4)	2,146	16	3,652	(270)	
2018	7,126	60	(491)	1	1,638	(3)	8,273	58	
2019	13,612	443	(790)	(5)	2,239	17	15,061	455	
2020	7,154	771	(455)	(3)	1,079	7	7,778	775	
TOTAL	29,931	992	(2,269)	(11)	7,102	37	34,764	1,018	

The IBNR provision is \$1.0 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.

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 following table 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 premium deficiency position (shown as a positive amount) prior to and 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.

*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:	807	(39)	1,096	(48)	1,903	(87)
balance as % unearned premium:	4.8%	-	6.5%	(0.1%)	11.3%	(0.1%)
actual unearned premium:	16,776					
less projected:		(705)				

### 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 104.8% rather than 103.1% (the valuation ultimate ratio for accident year 2020), 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.)

<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)*

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	515	4.7%	(288)	(2.6%)	227	2.1%	(62)	(1.4%)
CAY	11,522	104.8%	624	5.7%	12,146	110.5%	3,027	(0.3%)
TOTAL	12,037	109.5%	336	3.1%	12,373	112.6%	2,965	(1.7%)

("EP" based on 2020 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.

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.

## 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

		Amounts in \$000s				
IBNR + M/S actuarial present value adjustments	Accident Year	Actual Mar. 2020	Actual Apr. 2020	Projected May. 2020	Projected Jun. 2020	Projected Dec. 2020
	2007	(1)	(1)	(1)	(1)	(1)
	2008	2	2	2	2	2
	2009	11	11	11	11	11
	2010	4	4	4	4	4
	2011	17	17	17	17	17
	2012	40	40	39	40	36
	2013	(170)	(191)	(189)	(187)	(163)
	2014	142	120	119	119	109
discount rate 1.64%	2015	92	(12)	(11)	(11)	(4)
	2016	586	558	550	532	457
	2017	3,244	3,104	2,945	2,825	2,434
interest rate margin 25 basis pts	2018	8,446	8,273	8,154	7,981	6,651
	2019	15,042	15,061	14,623	14,067	12,255
	2020	5,199	7,778	10,025	12,117	16,626
	<b>TOTAL</b>	<b>32,654</b>	<b>34,764</b>	<b>36,288</b>	<b>37,516</b>	<b>38,434</b>
	Change		2,110	1,524	1,228	

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

**EXHIBIT B**

**IBNR**

TABLE EXHIBIT B

Amounts in \$000s

IBNR	Ultimate Loss Ratio	Accident Year	Actual Mar. 2020	Actual Apr. 2020	Projected May. 2020	Projected Jun. 2020	Projected Dec. 2020
	53.9%	2007	(1)	(1)	(1)	(1)	(1)
	68.3%	2008	2	2	2	2	2
	63.8%	2009	5	5	5	5	5
	73.4%	2010	4	4	4	4	4
	90.2%	2011	16	16	16	16	16
	102.2%	2012	(3)	(3)	(3)	(3)	(3)
	88.1%	2013	(287)	(305)	(302)	(299)	(267)
	85.2%	2014	41	19	19	19	17
	86.0%	2015	(121)	(224)	(222)	(220)	(198)
	93.2%	2016	177	150	146	139	120
	94.3%	2017	2,514	2,376	2,224	2,113	1,780
	93.9%	2018	7,285	7,126	7,019	6,858	5,657
	100.5%	2019	13,576	13,612	13,204	12,676	10,999
	103.1%	2020	4,729	7,154	9,241	11,173	14,790
		<b>TOTAL</b>	<b>27,937</b>	<b>29,931</b>	<b>31,352</b>	<b>32,482</b>	<b>32,921</b>
		Change		1,994	1,421	1,130	

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



EXHIBIT C

Premium Liabilities

TABLE EXHIBIT C

	Amounts in \$000s				
	Actual	Actual	Projected	Projected	Projected
	Mar. 2020	Apr. 2020	May. 2020	Jun. 2020	Dec. 2020
Premium Liabilities					
(1) unearned premium (UP)	17,095	16,776	17,612	18,490	21,399
FOR MEMBER SHARING					
(2) expected future costs ratio {% of (1)}	111.2%	111.3%	111.7%	112.0%	114.9%
(3) expected future costs {(1) x (2)}	19,006	18,679	19,665	20,712	24,583
(4) premium deficiency / (deferred policy acquisition cost)	1,911	1,903	2,053	2,222	3,184
Excluding Actuarial Present Value Adjustments					
(5) expected future costs ratio {% of (1)}	104.6%	104.8%	105.1%	105.4%	108.1%
(6) expected future costs {(1) x (5)}	17,889	17,583	18,510	19,496	23,139
(7) premium deficiency / (deferred policy acquisition cost)	794	807	898	1,006	1,740

**EXHIBIT D**

**Projected Year-end Policy Liabilities**

The table below presents the projected policy liabilities as at December 31, 2020, broken down by component.

Nova Scotia ending 2020		Projected Balances as at Dec. 31, 2020 (\$000s)									
Acc Yr	nominal values			actuarial present value adjustments (apvs)						TOTAL	
	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	5	65	(1)	-	7	-	7	6	71	
2010	-	4	4	-	-	-	-	-	-	4	
2011	-	16	16	(1)	-	2	-	2	1	17	
2012	517	(3)	514	(13)	2	51	(1)	50	39	553	
2013	1,677	(267)	1,410	(39)	6	141	(4)	137	104	1,514	
2014	1,200	17	1,217	(32)	5	122	(3)	119	92	1,309	
2015	2,715	(198)	2,517	(60)	8	252	(6)	246	194	2,711	
2016	3,371	120	3,491	(94)	14	429	(12)	417	337	3,828	
2017	5,398	1,780	7,178	(230)	36	876	(28)	848	654	7,832	
2018	5,842	5,657	11,499	(425)	57	1,414	(52)	1,362	994	12,493	
2019	4,584	10,999	15,583	(686)	109	1,917	(84)	1,833	1,256	16,839	
<b>PAYs (sub-total):</b>	<b>25,364</b>	<b>18,131</b>	<b>43,495</b>	<b>(1,581)</b>	<b>237</b>	<b>5,211</b>	<b>(190)</b>	<b>5,021</b>	<b>3,677</b>	<b>47,172</b>	
<b>CAY (2020)</b>	<b>11,462</b>	<b>14,790</b>	<b>26,252</b>	<b>(1,339)</b>	<b>210</b>	<b>3,124</b>	<b>(159)</b>	<b>2,965</b>	<b>1,836</b>	<b>28,088</b>	
<b>claims liabilities:</b>	<b>36,826</b>	<b>32,921</b>	<b>69,747</b>	<b>(2,920)</b>	<b>447</b>	<b>8,335</b>	<b>(349)</b>	<b>7,986</b>	<b>5,513</b>	<b>75,260</b>	
	Unearned Premium	Premium Deficiency / (DPAC)	Total Provision	discount	investment PfAD	nominal development PfAD	development PfAD discount	development PfAD	Total apvs	TOTAL*	
<b>premium liabilities:</b>	<b>21,399</b>	<b>1,740</b>	<b>23,139</b>	<b>(868)</b>	<b>114</b>	<b>2,285</b>	<b>(87)</b>	<b>2,198</b>	<b>1,444</b>	<b>24,583</b>	
<b>policy liabilities:</b>			<b>92,886</b>	<b>(3,788)</b>	<b>561</b>	<b>10,620</b>	<b>(436)</b>	<b>10,184</b>	<b>6,957</b>	<b>99,843</b>	

\*Total may not be sum of parts, as apvs apply to future costs within UPR

**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, 2020 from the valuation), followed by the selected discount rate and the associated margin for investment income.

Selected Claims Development MfADs (Dec. 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	10.0%	10.0%	10.0%	10.0%
2016	12.5%	10.0%	12.5%	12.3%
2017	12.5%	10.0%	9.0%	12.2%
2018	12.5%	10.0%	11.3%	12.3%
2019	12.5%	10.0%	8.2%	12.3%
2020	12.4%	10.0%	5.5%	11.9%
<u>prem liab</u>	<u>11.9%</u>	<u>10.0%</u>	<u>5.1%</u>	<u>10.0%</u>

discount rate: 1.64%  
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, 2020 from the latest valuation date (projections in exhibits A to D are to Dec. 31, 2020, and are based on more up-to-date information). We have included the most recent valuation selection (1.64%), the prior valuation assumption (1.46%) and the prior fiscal year end valuation assumption (1.46%) 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, 2020 projected Unpaid							
	0.64%	1.14%	1.64%	2.14%	2.64%	3.14%	1.46%	1.46%
2008	-	-	-	-	-	-	-	-
2009	54	54	54	53	53	53	54	54
2010	-	-	-	-	-	-	-	-
2011	124	123	122	120	119	118	122	122
2012	454	451	447	444	440	437	448	448
2013	720	714	708	702	696	690	710	710
2014	578	573	569	564	560	555	570	570
2015	2,072	2,057	2,042	2,027	2,013	1,999	2,047	2,047
2016	3,671	3,641	3,611	3,583	3,554	3,527	3,622	3,622
2017	6,779	6,712	6,647	6,583	6,520	6,458	6,670	6,670
2018	12,449	12,305	12,164	12,026	11,891	11,759	12,215	12,215
2019	18,681	18,427	18,179	17,940	17,703	17,473	18,269	18,269
2020	25,959	25,546	25,148	24,764	24,388	24,019	25,293	25,293
Total	71,541	70,603	69,691	68,806	67,937	67,088	70,020	70,020
	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							
	0.64%	1.14%	1.64%	2.14%	2.64%	3.14%	1.46%	1.46%
Total	1,850	912	-	(885)	(1,754)	(2,603)	329	329
	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							
	0.64%	1.14%	1.64%	2.14%	2.64%	3.14%	1.46%	1.46%
2008	-	-	-	-	-	-	-	-
2009	-	-	-	(1.9%)	(1.9%)	(1.9%)	-	-
2010	-	-	-	-	-	-	-	-
2011	1.6%	0.8%	-	(1.6%)	(2.5%)	(3.3%)	-	-
2012	1.6%	0.9%	-	(0.7%)	(1.6%)	(2.2%)	0.2%	0.2%
2013	1.7%	0.8%	-	(0.8%)	(1.7%)	(2.5%)	0.3%	0.3%
2014	1.6%	0.7%	-	(0.9%)	(1.6%)	(2.5%)	0.2%	0.2%
2015	1.5%	0.7%	-	(0.7%)	(1.4%)	(2.1%)	0.2%	0.2%
2016	1.7%	0.8%	-	(0.8%)	(1.6%)	(2.3%)	0.3%	0.3%
2017	2.0%	1.0%	-	(1.0%)	(1.9%)	(2.8%)	0.3%	0.3%
2018	2.3%	1.2%	-	(1.1%)	(2.2%)	(3.3%)	0.4%	0.4%
2019	2.8%	1.4%	-	(1.3%)	(2.6%)	(3.9%)	0.5%	0.5%
2020	3.2%	1.6%	-	(1.5%)	(3.0%)	(4.5%)	0.6%	0.6%
Total	2.7%	1.3%	-	(1.3%)	(2.5%)	(3.7%)	0.5%	0.5%
	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 Prior Month Actual Amount	Sum of Projected Change	Sum of Change Due to AvsP Variances	Sum of Change Due to Valuation Implementation	Sum of Total Change	Sum of % Total Change	Sum of Current Month Final Amount
2007	(1)	-	-	-	-	-	(1)
2008	2	-	-	-	-	-	2
2009	11	-	-	-	-	-	11
2010	4	-	-	-	-	-	4
2011	17	-	-	-	-	-	17
2012	40	(1)	1	-	-	-	40
2013	(170)	3	(24)	-	(21)	12.4%	(191)
2014	142	(1)	(21)	-	(22)	(15.5%)	120
2015	92	(1)	(103)	-	(104)	(113.0%)	(12)
2016	586	(9)	(19)	-	(28)	(4.8%)	558
2017	3,244	(36)	(104)	-	(140)	(4.3%)	3,104
2018	8,446	(231)	58	-	(173)	(2.0%)	8,273
2019	15,042	(436)	455	-	19	0.1%	15,061
2020	5,199	1,804	775	-	2,579	49.6%	7,778
<b>Grand Total</b>	<b>32,654</b>	<b>1,092</b>	<b>1,018</b>	<b>-</b>	<b>2,110</b>	<b>6.5%</b>	<b>34,764</b>

EXHIBIT G

Page 2 of 2

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

RSP		Nova Scotia						IBNR - in \$000s
AccountCode Desc		IBNR - Undiscounted						
AccYear	Values							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	Sum of Total Change	Sum of % Total Change		
2007	(1)	-	-	-	-	-	(1)	
2008	2	-	-	-	-	-	2	
2009	5	-	-	-	-	-	5	
2010	4	-	-	-	-	-	4	
2011	16	-	-	-	-	-	16	
2012	(3)	-	-	-	-	-	(3)	
2013	(287)	3	(21)	-	(18)	6.3%	(305)	
2014	41	-	(22)	-	(22)	(53.7%)	19	
2015	(121)	1	(104)	-	(103)	85.1%	(224)	
2016	177	(5)	(22)	-	(27)	(15.3%)	150	
2017	2,514	(25)	(113)	-	(138)	(5.5%)	2,376	
2018	7,285	(219)	60	-	(159)	(2.2%)	7,126	
2019	13,576	(407)	443	-	36	0.3%	13,612	
2020	4,729	1,654	771	-	2,425	51.3%	7,154	
<b>Grand Total</b>	<b>27,937</b>	<b>1,002</b>	<b>992</b>	<b>-</b>	<b>1,994</b>	<b>7.1%</b>	<b>29,931</b>	