



**NOVA SCOTIA RISK SHARING POOL**

**SEPTEMBER 2017 OPERATIONAL REPORT**

**ACTUARIAL HIGHLIGHTS**

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**ACTUARIAL HIGHLIGHTS**

**RSP NOVA SCOTIA**

**OPERATIONAL REPORT**

**SEPTEMBER 2017**

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## 1 Summary

### 1.1 Valuation Schedule (Fiscal Year 2017)

The September 2017 Operational Report leverages actuarial assumptions consistent with last month (that is, it does not reflect the results of an updated valuation). The table immediately below summarizes the implemented valuations and future scheduled valuations for fiscal year 2017.

<b>NOVA SCOTIA RISK SHARING POOL FISCAL YEAR 2017 – 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, 2016 (completed)	0.51% mfad: 25 bp	Oct. 2016	updated valuation (roll forward): accident year 2016 loss ratio remained at 94.8%; discount rate decreased by 5 basis points; no change to selected margins for adverse deviations
Dec. 31, 2016 (completed)	1.01% mfad: 25 bp	Mar. 2017	updated valuation: accident year 2016 loss ratio decreased 5.0 points to 89.8%; accident year 2017 loss ratio decreased 1.0 points to 96.5%; discount rate increased by 50 basis points; no change to selected margins for adverse deviations
Mar. 31, 2017 (completed)	0.93% mfad: 25 bp	May 2017	updated valuation (roll forward): accident year 2017 loss ratio increased 0.9 points to 97.4%; discount rate decreased by 8 basis points; no change to selected margins for adverse deviations
Jun. 30, 2017	1.17% mfad: 25 bp	Aug. 2017	updated valuation: accident year 2017 loss ratio decreased 5.3 points to 92.1%; discount rate increased by 24 basis points; selected margins for adverse deviations were updated
Sep. 30, 2017		Oct. 2017	update valuation (roll forward):

Under the proposed schedule for fiscal year 2017, the “off-half” valuation quarters ending March 31, 2017 and September 30, 2017 would not reflect a full valuation update of assumptions, but would rather “roll-forward” key assumptions from the previous valuation.

### 1.2 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.

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

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 changes are provided below (there have been no changes in these descriptions since last month's Highlights).

The **Supreme Court of Canada** rendered its judgment on **Saadati v Moorhead (2017 SCC 28, rendered on Jun 2, 2017)**. Saadati was involved in a collision in July of 2005 in British Columbia and sued the at-fault driver for damages. According to the Supreme Court decision, *“The trial judge found that the ... accident caused S[aadati] psychological injuries, including personality change and cognitive difficulties. ...and awarded S[aadati] \$100,000 for non-pecuniary damages.”* The trial decision was appealed to the BC Court of Appeal where the trial's \$100,000 non-pecuniary award was dismissed. The Supreme Court upheld the \$100,000 non-pecuniary award, determining:

- *“A finding of legally compensable mental injury need not rest, in whole or in part, on the claimant proving a recognized psychiatric injury.”*
- *“...a trier of fact adjudicating a claim of mental injury is not concerned with diagnosis, but with symptoms and their effects.”*
- *“Expert evidence can assist in determining whether or not a mental injury has been shown, but where psychiatric diagnosis is unavailable, it remains open to a trier of fact to find on other evidence adduced by the claimant that he or she has proven on a balance of probabilities the occurrence of mental injury.”*

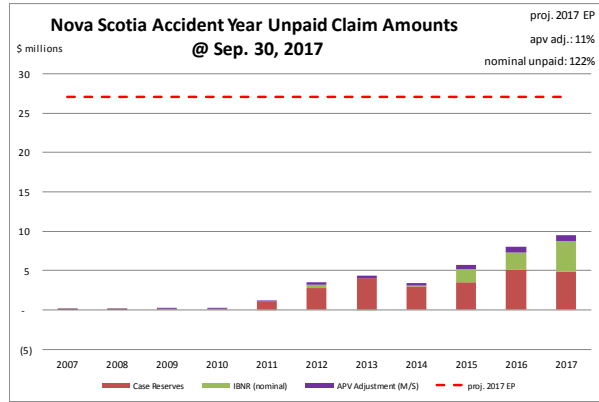
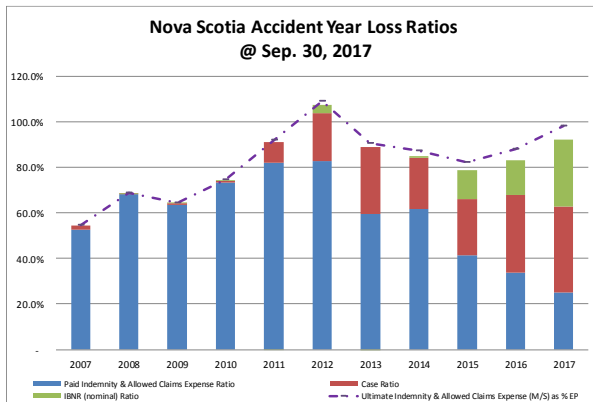
At the current time, no adjustments have been made to our valuation estimates or views based on the judgment as rendered, but we continue to review and consider the implications of the judgment.

### **1.4 Current Provision Summary**

The charts at the top of the next page show the current levels of claim liabilities<sup>1</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 2017 full year earned premium (the red hash-mark line) to provide some perspective.

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<sup>1</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 (\$2.9 million – see table immediately below) represents 11% of the earned premium projected for the full year 2017 (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	24,656	68.4%
ibnr	8,438	23.4%
M/S apv adjust.	2,941	8.2%
<b>M/S total</b>	<b>36,035</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 largest component of the claim liabilities for this pool is case reserves. Approximately 72% of the IBNR balance relates to accident years 2016 and 2017 (see Exhibit B). Approximately 86% of the M/S

total claim liabilities are related to accident years 2013-2017 inclusive (i.e. the most recent 5 accident years).

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

premium liabilities (\$000s)	amt	%
unearned prem	13,920	98.8%
prem def/(dpac)	(831)	(5.9%)
M/S apv adjust.	997	7.1%
<b>M/S total</b>	<b>14,086</b>	<b>100.0%</b>

policy liabilities (\$000s)	amt	%
claim	33,094	66.0%
premium	13,089	26.1%
M/S apv adjust.	3,938	7.9%
<b>M/S total</b>	<b>50,121</b>	<b>100.0%</b>

## 2 Activity During the Month of September 2017

### 2.1 Recorded Premium and Claims Activity

The table at the top of the next page 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>2</sup>.

<sup>2</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)*

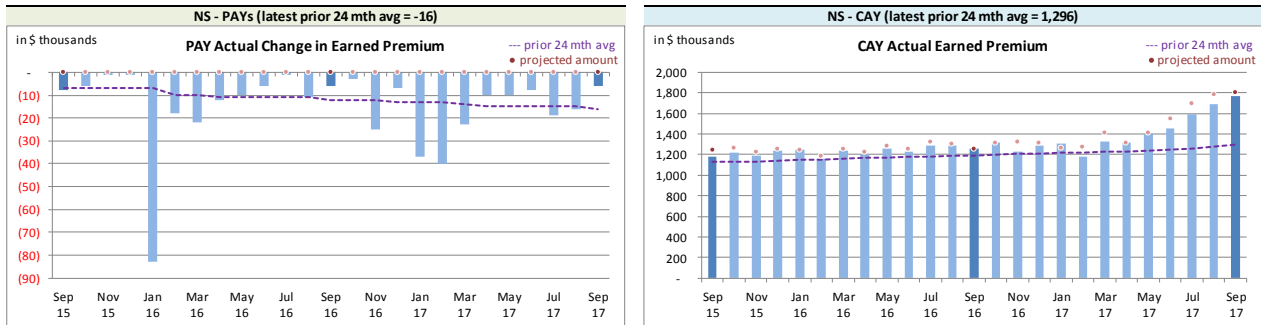
Table 01 Accident Year	Earned Premium		Paid Indemnity & Allowed Claims Expense		Case increase / (decrease)		Recorded increase / (decrease)	
	Actual	Actual less Projected	Actual	Actual less Projected	Actual	Actual less Projected	Actual	Actual less Projected
Prior	-	-	(112)	(228)	34	141	(78)	(87)
2015	(1)	(1)	170	8	306	423	476	431
2016	(5)	(5)	232	5	940	1,063	1,172	1,068
2017	1,768	(35)	467	(25)	1,242	681	1,709	656
TOTAL	1,762	(41)	757	(240)	2,522	2,308	3,279	2,068

(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 charts immediately below show actual **earned premium**<sup>3</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.

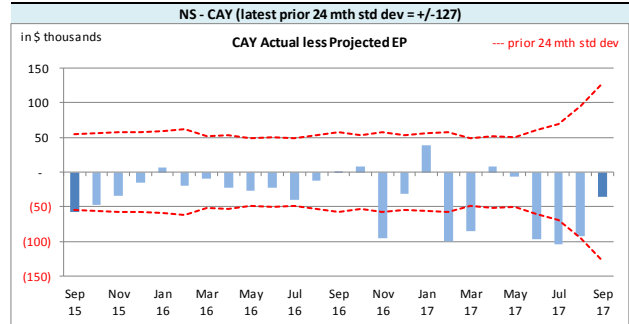
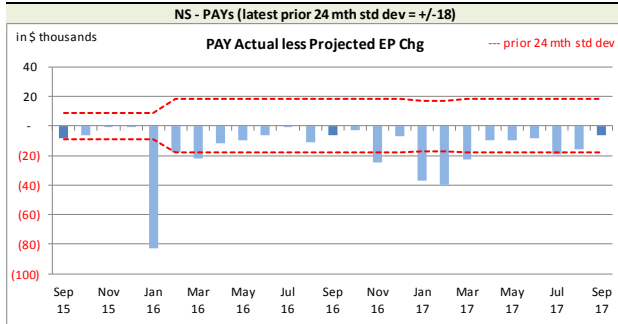
*Nova Scotia RSP Actual Earned Premium by Calendar Month*


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

The associated variance between the actual changes and the projections from the previous month are shown in the charts at the top of the next page. **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>3</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)	(16)	1,296
std dev	18	127
A-P <> std dev	7	6
% <> std dev	28.0%	24.0%
norm <> std dev	31.7%	31.7%

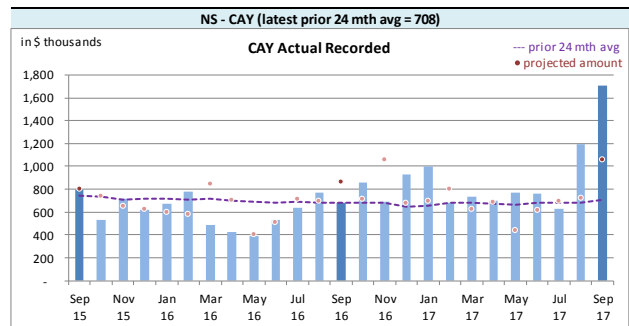
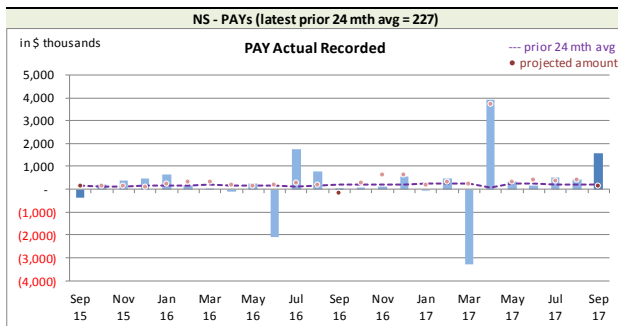
We project **earned premium** changes from known unearned premium and projected written premium levels, but upload the total projections as current accident year (CAY). This process has generated prior accident years' (PAYS) bias<sup>4</sup>, with actuals generally lower than projected. However, the magnitude is not high relative to monthly

premium, and the variances are within the prior 24-month standard deviation slightly more often than indicated by a normal distribution (see left table above). In addition to the PAYS' bias, the CAY has also shown bias, with actuals being generally lower than projected. Starting with the August 2016 projections, we have modified our projections processes in an attempt to account for CAY bias. Over time, we may consider other projection approaches to narrow monthly variance levels further, but it is not currently deemed a priority. Projection variances have also been exacerbated by written premium variances, where our projections, based on information provided by larger RSP users, have been proven to be too high (June variance of \$689 thousand, July variance of \$818 thousand, August variance of \$807 thousand, September variance of \$1.3 million).

**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.

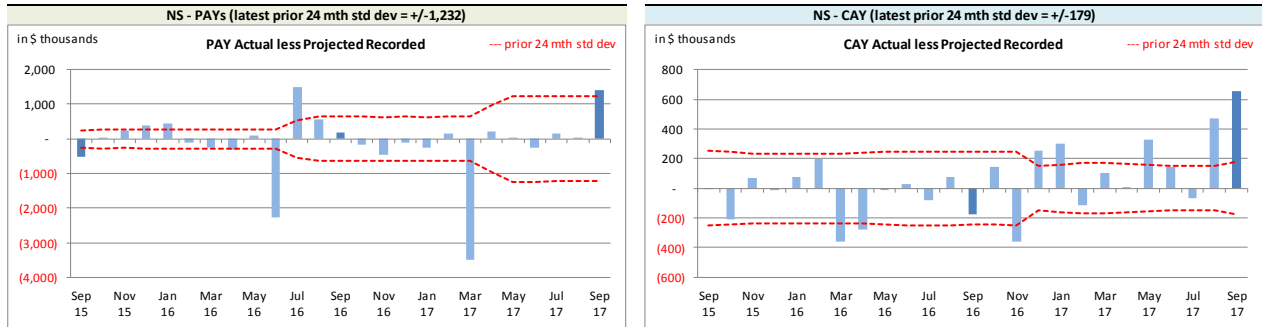
*Nova Scotia RSP Actual Recorded by Calendar Month*



<sup>4</sup>The PAYS' variances will show bias as the projection upload forces all earned premium projections to be attributed to the CAY.

**Recorded** activity variances from the previous month’s projections are shown in the charts 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: **Recorded** Variances by Calendar Month*



On Latest \$ thousands		
<b>Recorded</b>	PAYS	CAY
Mthly Avg Recorded (prior 24 mths)	227	708
std dev	1,232	179
A-P <> std dev	8	8
% <> std dev	32.0%	32.0%
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. That said, for prior accident years’ (PAYS) **recorded** variances (left chart above), the percentage of months (32%) with variances in excess of one standard deviation suggests the projection process performs no better than simply projecting based on a 24-month average.

The PAYS **recorded** variance for the current month was outside the one standard deviation band. The activity was reviewed and confirmed. Through 2016 and 2017, a member has been conducting a comprehensive review of their open claims transactions as reported to the FA RSP system with correcting transactions posted in the current month (September 2017) accounting for most of the PAY recorded activity in the month. The corrections are being reviewed and discussed with the member, in conjunction with the FA internal audit team, to ensure our records are accurate in relation to the member’s own records on their RSP claims’ portfolio.

The current accident year (CAY) **recorded** variances (right chart above) have resulted in 32% of last 24 months generating variances in excess of a 24-month standard deviation, suggesting the projection process performs no better than simply projecting based on a 24-month average. We are considering ways to improve our projection process as a result.

The CAYS **recorded** variance for the current month was outside the one standard deviation band. The activity was reviewed and confirmed, with the variance attributed to process variance.

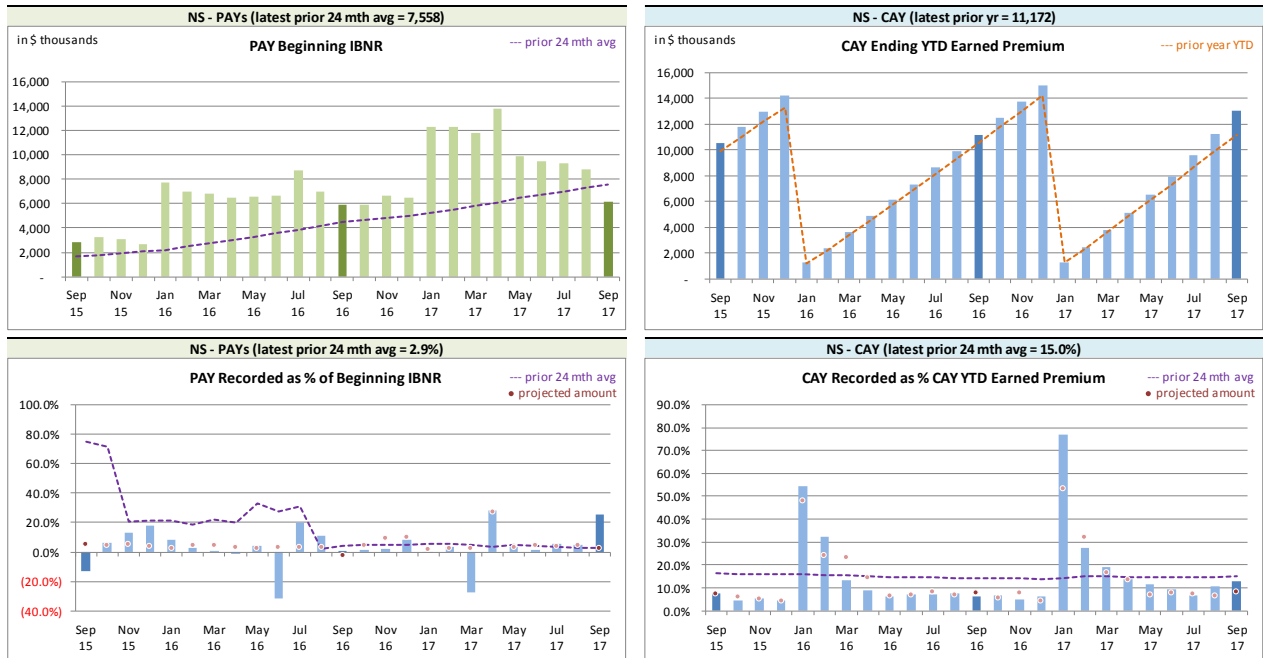
The method for establishing IBNR adjusts automatically for changes in **earned premium** and **recorded** claims activity level (see sections 2.2 and 3).

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 influence<sup>5</sup> 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:

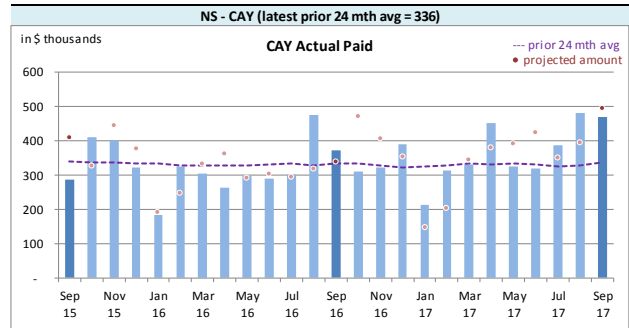
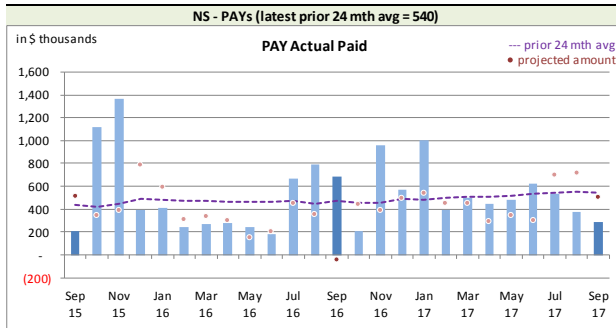
- to offset actual **recorded** activity (through loss ratio matching);
- the annual switchover as a current accident year becomes a prior accident year (occurs in January); and
- when a new valuation is implemented, where the valuation resulted in changes to the selection of prior accident years’ ultimate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

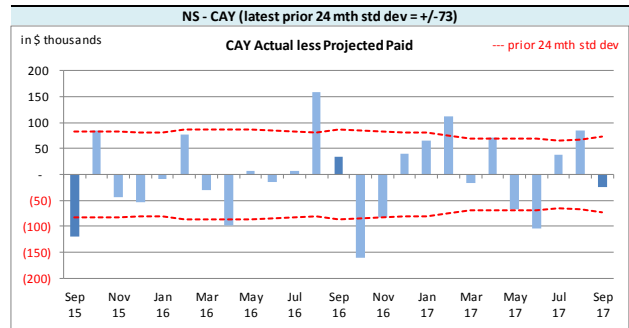
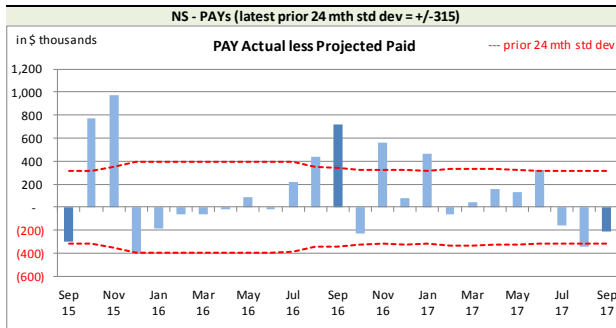
<sup>5</sup>Our recorded activity projections for the prior accident years are based on selected ratios of recorded activity to beginning unpaid balances, whereas the current accident year projections are based on selected ratios of year-to-date IBNR to year-to-date selected ultimate (i.e. selected LR 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 charts 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			
	<b>Paid</b>	PAYS	CAY
Mthly Avg Paid (prior 24 mths)		540	336
std dev		315	73
A-P <> std dev		9	9
% <> std dev		36.0%	36.0%
norm <> std dev		31.7%	31.7%

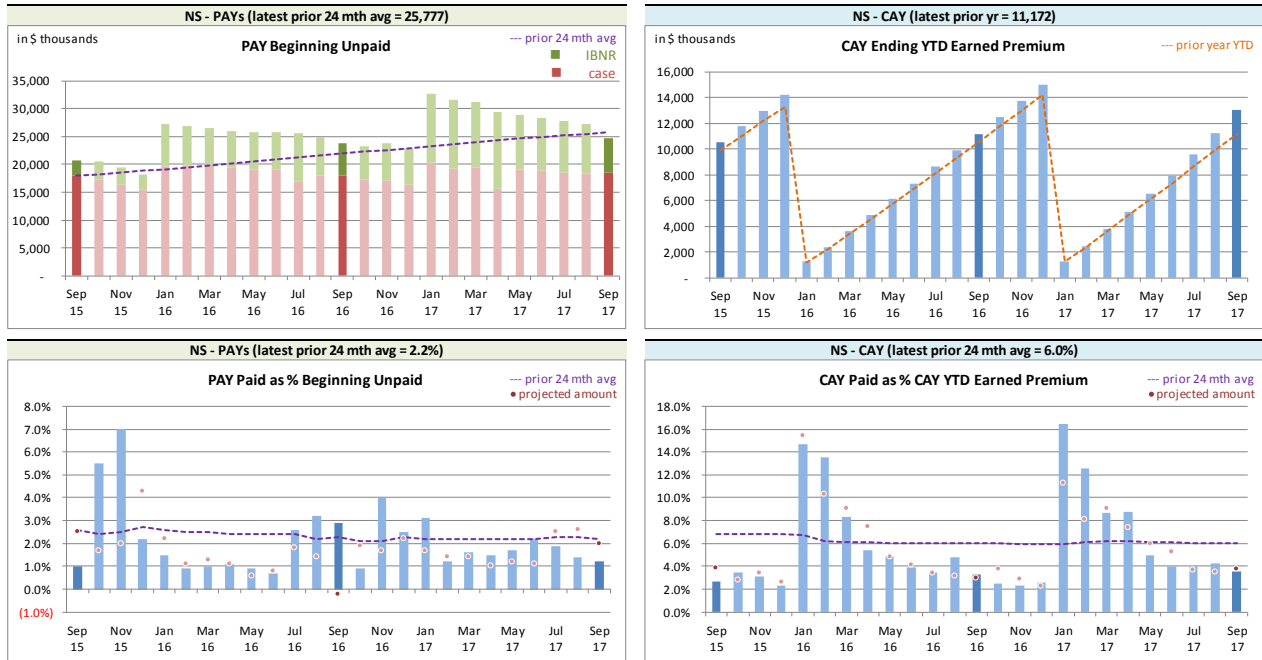
With respect to **paid** indemnity & allowed claims expense activity, caution must be exercised in reviewing the variances as this is a small pool and single claim transactions that are normal course for the business may look “unusual” and generate relatively “significant” variances that in nominal value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

With 36% of months with prior accident years (PAYS) **paid** variances in excess of a prior 24-month standard deviation (see table above), this suggests the projection process has performed no better than simply projecting based on the previous 24-month average. We do not see evidence of bias in the projections.

The current accident year (CAY) **paid** variances (see right chart above), do not appear to indicate bias. At 36% of projections outside of one standard deviation (see table above), the projection process seems to have performed no better than simply projecting based on the previous 24-month average.

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 influence<sup>6</sup> 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 IBNR<sup>7</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 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 immediately below summarizes variances in provisions included in the September 2017

<sup>6</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>7</sup>For ease of discussion, “IBNR” is used in place of “provisions for incurred but not recorded (IBNR) and development”.

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

Accident Year	IBNR		actuarial present value adjustments				IBNR + actuarial present value adjustments	
	Actual	Actual less Projected	Discount Amount		Provisions for Adverse Deviations		Actual	Actual less Projected
			Actual	Actual less Projected	Actual	Actual less Projected		
Prior	560	87	(296)	(5)	1,287	23	1,551	105
2015	1,767	(431)	(147)	-	662	(1)	2,282	(432)
2016	2,287	(1,072)	(242)	-	922	(1)	2,967	(1,073)
2017	3,824	(688)	(314)	-	1,069	(1)	4,579	(689)
TOTAL	8,438	(2,104)	(999)	(5)	3,940	20	11,379	(2,089)

The IBNR provision is \$2.1 million lower 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 table at the top of the next page summarizes the variances in the provisions for premium deficiency liability / (deferred policy acquisition cost asset) included in the September 2017 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) before 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 expected future policy obligations (costs) associated with the unearned premium and cause the write down of the asset value and the creation of the liability. 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:	(831)	77	997	(95)	166	(18)
balance as % unearned premium:	(6.0%)	-	7.2%	-	1.2%	-
actual unearned premium:	13,920					
less projected:	(1,305)					

### 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>8</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 table at the top of the next page summarizes the calendar year-to-date results for indemnity & allowed claims expenses<sup>9</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 93.3% rather than 92.1% (the valuation ultimate ratio for accident year 2017), 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>8</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>9</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	(3,621)	(28.2%)	(1,387)	(10.8%)	(5,008)	(38.9%)	(35)	5.9%
CAY	12,000	93.3%	755	5.9%	12,755	99.2%	1,728	(0.2%)
TOTAL	8,379	65.2%	(632)	(4.9%)	7,747	60.2%	1,693	5.7%

(“% EP” based on 2017 calendar year-to-date earned premium; ratios may not total due to rounding)

The prior accident years (PAYs) changes from last month are due to the release of the actuarial present value adjustments with claims payments. The loss ratio change year-to-date 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 Aug. 2017	Actual Sep. 2017	Projected Oct. 2017	Projected Nov. 2017	Projected Dec. 2017
	2007	4	4	4	4	4
	2008	2	41	40	39	38
	2009	18	31	31	31	31
	2010	15	41	40	39	38
	2011	75	81	80	80	78
discount rate	2012	659	721	710	697	686
1.17%	2013	177	231	230	228	226
	2014	515	401	397	380	374
interest rate margin	2015	2,775	2,282	2,184	2,080	1,990
25 basis pts	2016	4,165	2,967	2,780	2,599	2,416
	2017	4,560	4,579	5,429	6,156	6,750
	<b>TOTAL</b>	<b>12,965</b>	<b>11,379</b>	<b>11,925</b>	<b>12,333</b>	<b>12,631</b>
	Change		<b>(1,586)</b>	546	408	

*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 Aug. 2017	Actual Sep. 2017	Projected Oct. 2017	Projected Nov. 2017	Projected Dec. 2017
	54.3%	2007	1	1	1	1	1
	68.6%	2008	1	37	36	35	34
	64.2%	2009	7	19	19	19	19
	74.3%	2010	3	27	26	25	24
	91.0%	2011	(16)	(11)	(11)	(11)	(11)
	107.2%	2012	413	473	464	455	446
	88.4%	2013	(130)	(78)	(76)	(74)	(73)
	84.8%	2014	203	92	89	85	82
	78.6%	2015	2,243	1,767	1,679	1,595	1,515
	83.2%	2016	3,463	2,287	2,127	1,978	1,820
	92.1%	2017	3,905	3,824	4,559	5,173	5,649
		<b>TOTAL</b>	<b>10,093</b>	<b>8,438</b>	<b>8,913</b>	<b>9,281</b>	<b>9,506</b>
		Change		(1,655)	475	368	

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



EXHIBIT C

Premium Liabilities

TABLE EXHIBIT C

	Amounts in \$000s				
	Actual Aug. 2017	Actual Sep. 2017	Projected Oct. 2017	Projected Nov. 2017	Projected Dec. 2017
Premium Liabilities					
(1) unearned premium (UP)	12,647	13,920	15,562	16,002	15,921
FOR MEMBER SHARING					
(2) expected future costs ratio {% of (1)}	101.2%	101.2%	101.2%	101.3%	101.3%
(3) expected future costs {(1) x (2)}	12,794	14,086	15,755	16,206	16,129
(4) premium deficiency / (deferred policy acquisition cost)	147	166	193	204	208
Excluding Actuarial Present Value Adjustments					
(5) expected future costs ratio {% of (1)}	94.0%	94.0%	94.1%	94.1%	94.1%
(6) expected future costs {(1) x (5)}	11,889	13,089	14,640	15,059	14,988
(7) premium deficiency / (deferred policy acquisition cost)	(758)	(831)	(922)	(943)	(933)

**EXHIBIT D**
**Projected Year-end Policy Liabilities**

The table below presents the projected policy liabilities as at December 31, 2017, broken down by component.

Nova Scotia		Projected Balances as at Dec. 31, 2017 (\$000s)							
ending 2017		nominal values			actuarial present value adjustments (apvs)				
Acc Yr	Case	IBNR	Total Unpaid	discount	investment PfAD	nominal development PfAD	Total apvs	TOTAL	
2007	37	1	38	(1)	-	4	3	41	
2008	15	34	49	(1)	-	5	4	53	
2009	107	19	126	(1)	-	13	12	138	
2010	134	24	158	(3)	1	16	14	172	
2011	1,106	(11)	1,095	(24)	5	110	89	1,184	
2012	2,696	446	3,142	(82)	16	314	240	3,382	
2013	3,948	(73)	3,875	(101)	23	387	299	4,174	
2014	2,812	82	2,894	(72)	14	359	292	3,186	
2015	3,309	1,515	4,824	(135)	29	598	475	5,299	
2016	4,597	1,820	6,417	(212)	45	789	596	7,013	
PAYs (sub-total):	18,761	3,857	22,618	(632)	133	2,595	2,024	24,642	
CAY (2017)	7,060	5,649	12,709	(458)	89	1,525	1,101	13,810	
<b>claims liabilities:</b>	<b>25,821</b>	<b>9,506</b>	<b>35,327</b>	<b>(1,090)</b>	<b>222</b>	<b>4,120</b>	<b>3,125</b>	<b>38,452</b>	
	Unearned Premium	Premium Deficiency / (DPAC)	Total Provision	discount	investment PfAD	nominal development PfAD	Total apvs	TOTAL*	
<b>premium liabilities:</b>	15,921	(933)	14,988	(471)	103	1,559	1,141	16,129	
*Total may not be sum of parts, as apvs apply to future costs within UPR									
<b>policy liabilities:</b>			<b>50,315</b>	<b>(1,561)</b>	<b>325</b>	<b>5,679</b>	<b>4,266</b>	<b>54,581</b>	

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, 2017 from the valuation), followed by the selected discount rate and the associated margin for investment income.

Selected Claims Development MfADs (Jun. 30, 2017)

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	12.5%	10.0%	9.8%	12.4%
2015	12.5%	10.0%	12.5%	12.4%
2016	12.5%	10.0%	12.5%	12.3%
2017	12.4%	10.0%	6.4%	12.0%
2018	12.1%	10.0%	5.1%	10.6%
prem liab	12.1%	10.0%	5.1%	10.6%

discount rate: 1.17%  
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, 2017 from the latest valuation date (projections in exhibits A to D are also to Dec. 31, 2017, but are based on more up-to-date information). We have included both the most recent valuation selection (1.17%), the prior valuation assumption (0.93%) and the prior fiscal year end valuation assumption (0.51%) for comparative purposes. A 25 basis point margin for investment return adverse deviation is used in all scenarios presented.

\$ Format: \$000s

Actuarial Present Value of Provisions at Various Discount Rates - Dec. 31, 2017 projected Unpaid								
AY	0.67%	1.17%	1.67%	2.17%	2.67%	3.17%	0.93%	0.51%
2007	35	35	35	35	34	34	35	36
2008	8	8	8	8	8	8	8	9
2009	78	78	78	77	77	77	78	78
2010	123	122	121	121	120	119	123	124
2011	1,060	1,050	1,040	1,031	1,021	1,012	1,055	1,063
2012	3,317	3,279	3,243	3,207	3,172	3,138	3,297	3,329
2013	3,400	3,363	3,326	3,290	3,255	3,221	3,380	3,413
2014	3,140	3,107	3,074	3,042	3,011	2,981	3,123	3,151
2016	7,808	7,697	7,588	7,482	7,379	7,280	7,749	7,844
2017	13,890	13,673	13,461	13,253	13,053	12,861	13,776	13,962
<b>Total</b>	<b>38,342</b>	<b>37,829</b>	<b>37,326</b>	<b>36,835</b>	<b>36,358</b>	<b>35,900</b>	<b>38,072</b>	<b>38,513</b>
	curr - 50 bp	curr val assumption	curr + 50bp	curr + 100bp	curr + 150bp	curr + 200bp	prior val assumption	prior fyr end assumption

Dollar Impact Relative to Valuation Assumption								
AY	0.67%	1.17%	1.67%	2.17%	2.67%	3.17%	0.93%	0.51%
<b>Total</b>	<b>513</b>	<b>-</b>	<b>(503)</b>	<b>(994)</b>	<b>(1,471)</b>	<b>(1,929)</b>	<b>243</b>	<b>684</b>
	curr - 50 bp	curr val assumption	curr + 50bp	curr + 100bp	curr + 150bp	curr + 200bp	prior val assumption	prior fyr end assumption

Percentage Impact Relative to Valuation Assumption								
AY	0.67%	1.17%	1.67%	2.17%	2.67%	3.17%	0.93%	0.51%
2007	-	-	-	-	(2.9%)	(2.9%)	-	2.9%
2008	-	-	-	-	-	-	-	12.5%
2009	-	-	-	(1.3%)	(1.3%)	(1.3%)	-	-
2010	0.8%	-	(0.8%)	(0.8%)	(1.6%)	(2.5%)	0.8%	1.6%
2011	1.0%	-	(1.0%)	(1.8%)	(2.8%)	(3.6%)	0.5%	1.2%
2012	1.2%	-	(1.1%)	(2.2%)	(3.3%)	(4.3%)	0.5%	1.5%
2013	1.1%	-	(1.1%)	(2.2%)	(3.2%)	(4.2%)	0.5%	1.5%
2014	1.1%	-	(1.1%)	(2.1%)	(3.1%)	(4.1%)	0.5%	1.4%
2016	1.4%	-	(1.4%)	(2.8%)	(4.1%)	(5.4%)	0.7%	1.9%
2017	1.6%	-	(1.6%)	(3.1%)	(4.5%)	(5.9%)	0.8%	2.1%
<b>Total</b>	<b>1.4%</b>	<b>-</b>	<b>(1.3%)</b>	<b>(2.6%)</b>	<b>(3.9%)</b>	<b>(5.1%)</b>	<b>0.6%</b>	<b>1.8%</b>
	curr - 50 bp	curr val assumption	curr + 50bp	curr + 100bp	curr + 150bp	curr + 200bp	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 - Discou**

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	4	-	-	-	-	-	4
2008	2	-	39	-	39	1,950.0%	41
2009	18	-	13	-	13	72.2%	31
2010	15	-	26	-	26	173.3%	41
2011	75	-	6	-	6	8.0%	81
2012	659	(10)	72	-	62	9.4%	721
2013	177	(1)	55	-	54	30.5%	231
2014	515	(8)	(106)	-	(114)	(22.1%)	401
2015	2,775	(61)	(432)	-	(493)	(17.8%)	2,282
2016	4,165	(125)	(1,073)	-	(1,198)	(28.8%)	2,967
2017	4,560	708	(689)	-	19	0.4%	4,579
<b>Grand Total</b>	<b>12,965</b>	<b>503</b>	<b>(2,089)</b>	<b>-</b>	<b>(1,586)</b>	<b>(12.2%)</b>	<b>11,379</b>

EXHIBIT G

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

RSP **Nova Scotia**

AccountCode Desc **IBNR - Undisc**  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	1	-	36	-	36	3,600.0%	37
2009	7	-	12	-	12	171.4%	19
2010	3	-	24	-	24	800.0%	27
2011	(16)	-	5	-	5	(31.3%)	(11)
2012	413	(8)	68	-	60	14.5%	473
2013	(130)	3	49	-	52	(40.0%)	(78)
2014	203	(4)	(107)	-	(111)	(54.7%)	92
2015	2,243	(45)	(431)	-	(476)	(21.2%)	1,767
2016	3,463	(104)	(1,072)	-	(1,176)	(34.0%)	2,287
2017	3,905	607	(688)	-	(81)	(2.1%)	3,824
<b>Grand Total</b>	<b>10,093</b>	<b>449</b>	<b>(2,104)</b>	<b>-</b>	<b>(1,655)</b>	<b>(16.4%)</b>	<b>8,438</b>