# ALBERTA NON-GRID RISK SHARING POOL

# JANUARY 2018 OPERATIONAL REPORT

# ACTUARIAL HIGHLIGHTS

Related Bulletin: F18-013 Alberta RSPs January 2018 Operational Reports

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**ACTUARIAL HIGHLIGHTS**

**RSP ALBERTA NON-GRID**

**OPERATIONAL REPORT**

**JANUARY 2018**

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# 1    Summary

## 1.1    Valuation Schedule (Fiscal Year 2018)

The January 2018 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 2018.

| ALBERTA NON-GRID RISK SHARING POOL FISCAL YEAR 2018 – SCHEDULE OF VALUATIONS | | | |
|---|---|---|---|
| **Valuation Date** | **Discount Rate (per annum)** | **Operational Report** | **Description of Changes** |
| Sep. 30, 2017 (completed) | 1.76% mfad: 25 bp | Oct. 2017 | updated valuation (roll forward): accident year 2017 loss ratio increased 2.9 points to 112.8%; discount rate increased by 56 basis points; no change to selected margins for adverse deviations |
| Dec. 31, 2017 | | Mar. 2018 | update valuation: |
| Mar. 31, 2018 | | May 2018 | update valuation (roll forward): |
| Jun. 30, 2018 | | Aug. 2018 | update valuation: |
| Sep. 30, 2018 | | Oct. 2018 | update valuation (roll forward): |

Under the proposed schedule for fiscal year 2018, the "off-half" valuation quarters ending March 31, 2018 and September 30, 2018 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 immediately below show the current levels of claim liabilities[1] booked by accident year[2]. 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 2018 full year earned premium (the red hash-mark line) to provide some perspective.
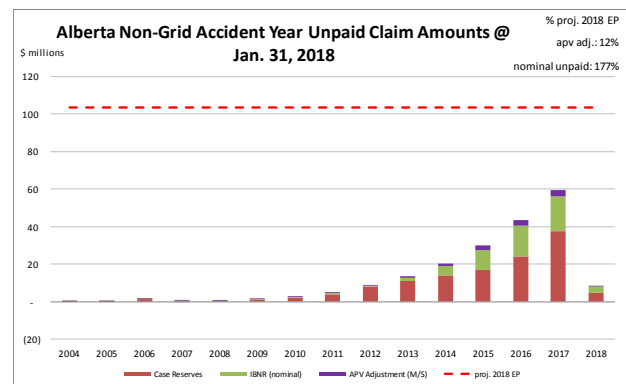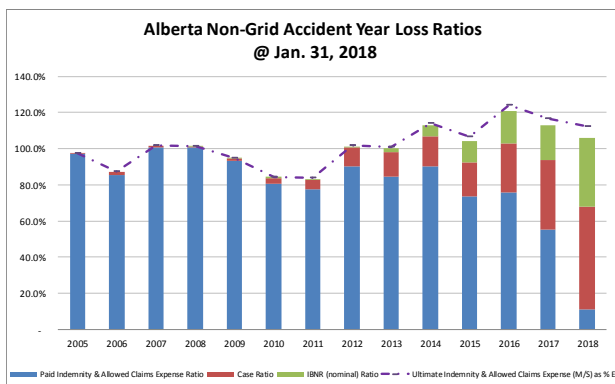


*"M/S" refers to "Member Statement" values – that is, actuarial present value adjustments at the selected discount rate.*

The current actuarial present value adjustments balance ($12.6 million – see table at the top of the next page) represents 12% of the earned premium projected for the full year 2018 (the upper right corner of the right chart above). If our current estimates of the nominal unpaid amounts prove to

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[1]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.

[2]Accident year 2004 was an incomplete year and therefore has been excluded from the loss ratio chart.

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 | 125,995 | 64.3% |
| ibnr | 57,264 | 29.2% |
| M/S apv adjust. | 12,627 | 6.4% |
| M/S total | 195,886 | 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 is in case reserves for this pool. Approximately 38% of the IBNR balance relates to accident years 2017 and 2018 (see Exhibit B). Approximately 83% of the M/S total claim liabilities are related to accident years 2014-2018 inclusive (i.e. the most recent 5 accident years), and approximately 1% is related to accident years 2008 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 | 48,528 | 89.0% |
| prem def/(dpac) | 3,055 | 5.6% |
| M/S apv adjust. | 2,949 | 5.4% |
| M/S total | 54,532 | 100.0% |

policy liabilities ($000s)

|  | amt | % |
|---|---|---|
| claim | 183,259 | 73.2% |
| premium | 51,583 | 20.6% |
| M/S apv adjust. | 15,576 | 6.2% |
| M/S total | 250,418 | 100.0% |

## 2    Activity During the Month of January 2018

### 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 Report[3].

*Alberta Non-Grid RSP Actual vs Projected Summary:  Recorded Transaction Amounts ($ thousands)*

| Table 01 | Earned Premium | | Paid Indemnity & Allowed Claims Expense | | Case increase / (decrease) | | Recorded increase / (decrease) | |
|---|---|---|---|---|---|---|---|---|
| Accident Year | Actual | Actual less Projected | Actual | Actual less Projected | Actual | Actual less Projected | Actual | Actual less Projected |
| Prior | (3) | (3) | 674 | (643) | 45 | 682 | 718 | 38 |
| 2016 | (2) | (2) | 452 | 44 | (878) | (783) | (426) | (739) |
| 2017 | (107) | (107) | 4,827 | (658) | (1,954) | 722 | 2,873 | 64 |
| 2018 | 8,402 | (118) | 952 | 321 | 4,756 | 1,060 | 5,708 | 1,381 |
| TOTAL | 8,290 | (230) | 6,904 | (937) | 1,969 | 1,681 | 8,873 | 744 |

(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). 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.

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

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

The charts immediately below show actual **earned premium**[4] 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.

*Alberta non-Grid RSP Actual **Earned Premium** by Calendar Month*
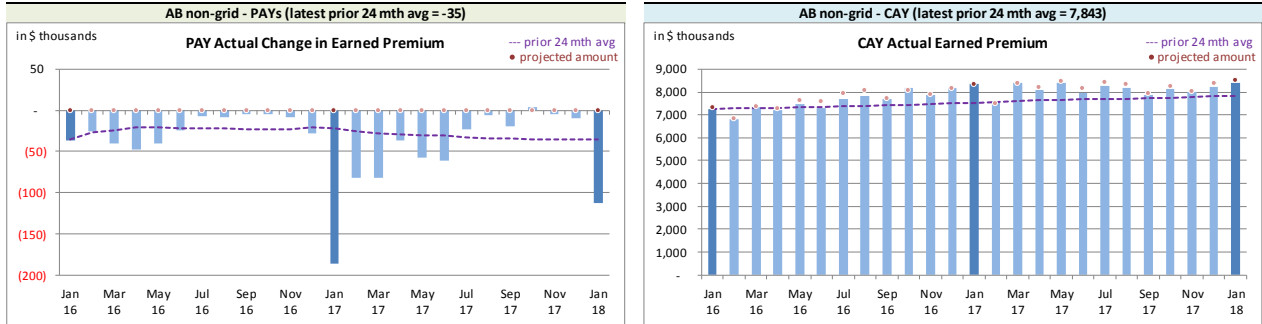


**Earned premium** changes during a given calendar month in relation to prior accident years tend to be at modest levels, although relatively high levels seem to occur at the beginning of each year.

We have noted and have investigated the unusually high level of PAYs earned premium activity earlier in 2017 and January 2018, particularly with respect to one member.  Management reviewed and was satisfied with the appropriateness of the 2017 transactions, and is in the process of reviewing the January 2018 transactions.

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.

*Alberta non-Grid RSP Actual vs. Projected Summary: **Earned Premium** Variances by Calendar Month*



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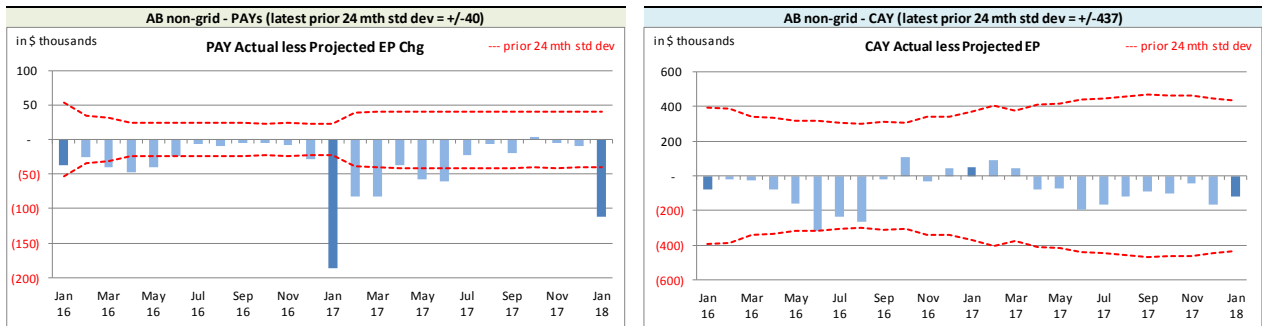
[4]Premium is earned on a daily basis based on the transaction term measured in days.  As a result, months with 31 days earned relatively more than those with 30 days, and February earns the least.

| On Latest $ thousands | | |
|---|---|---|
| **Earned Premium** | PAYs | CAY |
| Mthly Avg EP Chg (prior 24 mths) | (35) | 7,843 |
| std dev | 40 | 437 |
| A-P <> std dev | 10 | 1 |
| % <> std dev | 40.0% | 4.0% |
| 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[5], with actuals generally lower than projected. However, the magnitude is not high relative to monthly premium. In addition to the PAYs' bias, the CAY has also shown bias[6], with actuals being generally lower than projected, and we have modified our projections processes in response. (We note bias again post April 2017, which we are reviewing.) Over time, we may consider other projection approaches to narrow monthly variance levels further, but it is not currently deemed a priority.

### 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.

*Alberta non-Grid RSP Actual **Recorded** by Calendar Month*
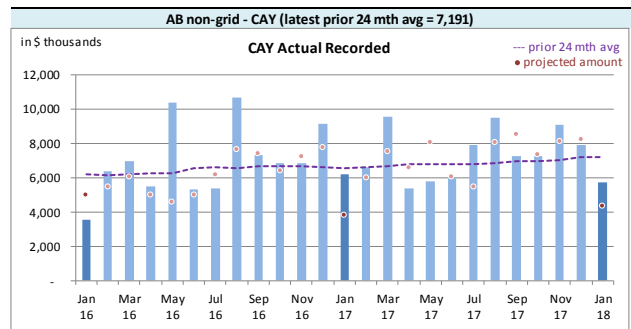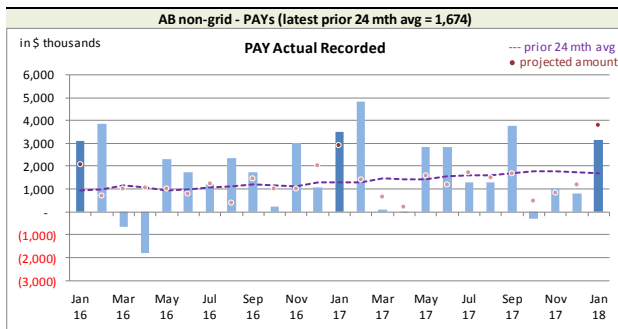


**Recorded** activity variances from the previous month's projections are shown in the charts immediately at the top of the next page, including the "prior 24-month standard deviation" levels to show how the variances from projection compare with historical standard deviations.

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

[6]We measure bias based on a 95% confidence range for a binominal distribution with trials based on the range being considered and 50% probability of success. The 24-month variances at January 2018 has only 5 months where the projection was higher than projected, and as the 95% confidence range is 7 to 17, bias continues to be indicated.

*Alberta non-Grid RSP Actual vs Projected Summary: **Recorded** Variances by Calendar Month*
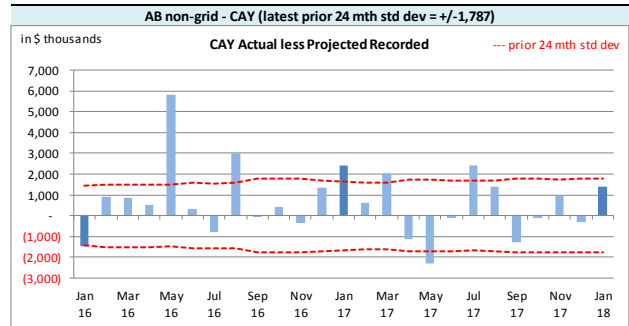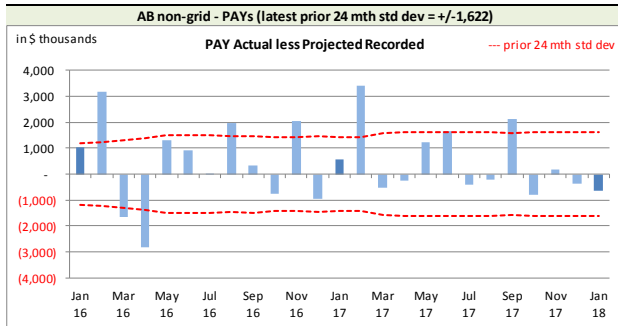


| On Latest $ thousands | | |
|---|---|---|
| **Recorded** | PAYs | CAY |
| Mthly Avg Recorded (prior 24 mths) | 1,674 | 7,191 |
| std dev | 1,622 | 1,787 |
| A-P <> std dev | 8 | 7 |
| % <> std dev | 32.0% | 28.0% |
| norm <> std dev | 31.7% | 31.7% |

With respect to **recorded** indemnity & allowed claims expense activity, 32% of the prior accident years' (PAYs) variances (left chart above) fell outside of the experience period's standard deviation, suggesting the projection process has performed no better than a projection based simply on the 24-month average. We have implemented changes in an attempt to address this. No bias has been indicated at a 95% confidence level on a lagging 24-month basis.

The current accident year (CAY) **recorded** variances (right chart above) have been greater than one standard deviation 28% of the time, suggesting that the projection process has performed no better than simply projecting the most recent prior 24-month average. No bias has been indicated at a 95% confidence level on a lagging 24-month basis.

FA management was notified on January 31, 2018 by a member of a potential recorded case reserve overstatement. Management investigated and estimated the overstatement for the Alberta non-Grid RSP as at October 31, 2017 as indicated in the table immediately below.

*Estimated case reserve overstatement as at Oct 31, 2017*

**Case Reserve Overstatement**
250 RSP AB-N

| | Amounts in $000s |
|---|---|
| 2010 | 9 |
| 2011 | - |
| 2012 | - |
| 2013 | (32) |
| 2014 | 102 |
| 2015 | 517 |
| 2016 | 2,531 |
| 2017 | 1,594 |
| TOTAL | 4,721 |

The overstatement of $4.7 million represented 3.8% of total case reserves recorded at October 31, 2017 for the Alberta non-Grid RSP, and 2.6% of nominal claims liabilities.

FA's year-end audited financial statements (as at October 31, 2017) were adjusted to reflect this overstatement by reducing the claims liabilities amount by the overstatement (as well as release of associated margins for adverse claims development). However, no adjustment has currently been made to reflect this in the Member Statements (i.e. monthly RSP Operational Reports). It is currently expected to be reflected via reductions in ultimate with the December 31, 2017 valuation, expected to be implemented into the March 2018 Operational Reports.

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 immediately below related to levels influencing **recorded** activity.

*Alberta non-Grid RSP Levels that influence[7] **Recorded** activity by Calendar Month*
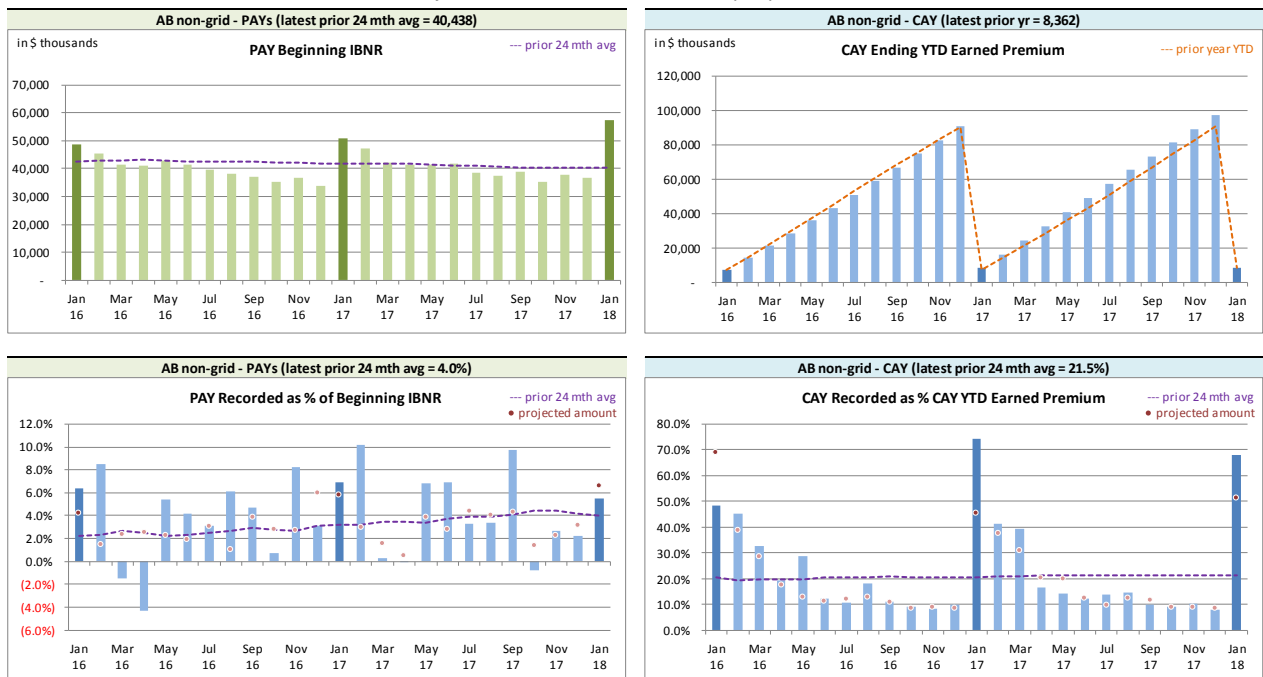


We track beginning prior accident years' IBNR as **recorded** activity "comes out of" IBNR. Changes in the prior accident years' beginning IBNR (see upper left chart above) occur for several possible reasons:

- 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

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[7]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.

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 immediately below 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.

*Alberta non-Grid RSP Actual **Paid** activity by Calendar Month*
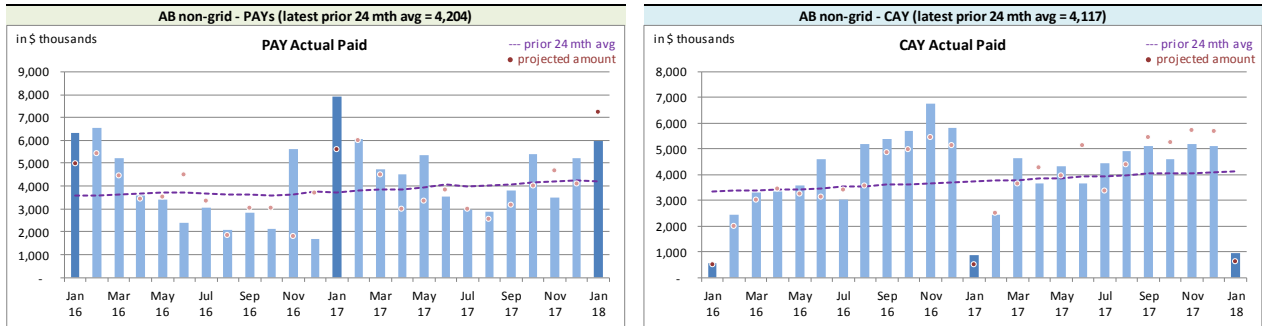


**Paid** activity variances from the previous month's projections are shown in the charts below, including the "prior 24-month standard deviation" levels to show how the variances from projection compare with historical standard deviations.

*Alberta non-Grid RSP Actual vs Projected Summary: **Paid** Variances by Calendar Month*
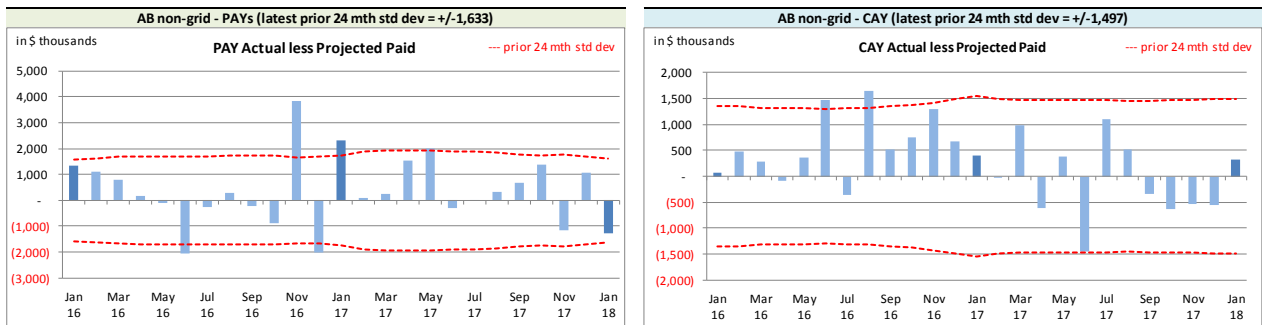


| On Latest $ thousands | | |
|---|---|---|
| **Paid** | PAYs | CAY |
| Mthly Avg Paid (prior 24 mths) | 4,204 | 4,117 |
| std dev | 1,633 | 1,497 |
| A-P <> std dev | 5 | 2 |
| % <> std dev | 20.0% | 8.0% |
| norm <> std dev | 31.7% | 31.7% |

With respect to **paid** indemnity & allowed claims expense, the prior accident years' variances (left chart above) do not appear to have bias and the magnitude of the variances do not appear to be an issue. With 20% of prior accident years (PAYs) **paid** variances over the last 25 calendar months falling outside of one standard deviation, the projection process has performed better than simply projecting based on a 24-month average. No bias has been indicated at a 95% confidence level on a lagging 24-month basis.

With only 8% of the current accident year (CAY) **paid** variances falling outside of one standard deviation of the experience period activity, the projection process has performed better than simply projecting based on a 24-month average. While no bias has been indicated at a 95% confidence

level on a lagging 24-month basis this month, it was indicated for each month from November 2015 through to September 2017. We made adjustments to our projection process to reflect this, and they appear to have been somewhat successful.

We have included, for reference, additional charts immediately below related to levels influencing **paid** activity.

*Alberta non-Grid RSP Levels that influence[8] **Paid** activity by Calendar Month*
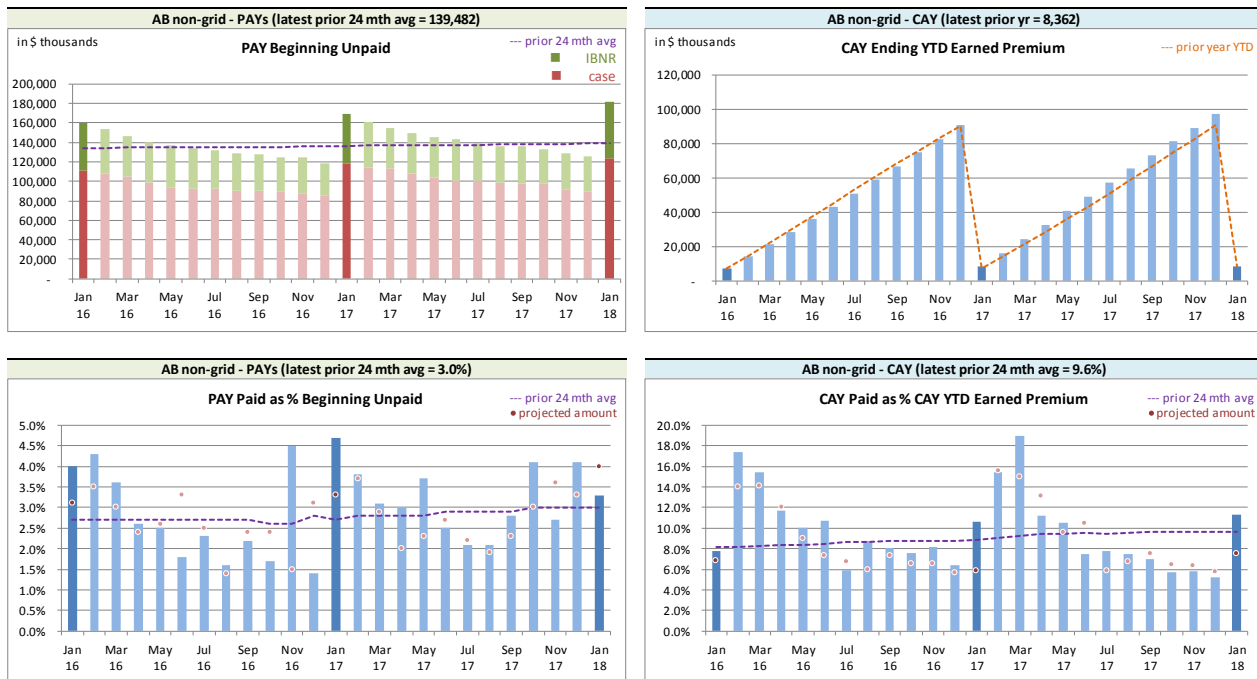


We track beginning prior accident years' unpaid balance (case and IBNR) as **paid** activity "comes out of" the unpaid balance. Changes in the prior accident years' beginning unpaid balance (see upper left chart above) occur for several possible reasons:

- 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) is used to determine the month's

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[8]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.

IBNR[9], and factors are 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 projections and actuals were based on the applicable valuation. The table immediately below summarizes variances in provisions included in the January 2018 Operational Report and the associated one-month projections from last month's Report.

*Alberta Non-Grid 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 | 19,411 | (43) | (3,321) | (28) | 8,656 | 71 | 24,746 | - |
| 2016 | 16,061 | 736 | (1,937) | 2 | 5,005 | (6) | 19,129 | 732 |
| 2017 | 18,610 | (185) | (2,912) | (28) | 6,603 | 63 | 22,301 | (150) |
| 2018 | 3,182 | (1,505) | (405) | 23 | 938 | (52) | 3,715 | (1,534) |
| TOTAL | 57,264 | (997) | (8,575) | (31) | 21,202 | 76 | 69,891 | (952) |

The IBNR provision is $1.0 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 January 2018 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.

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[9]For ease of discussion, "IBNR" is used in place of "provisions for incurred but not recorded (IBNR) and development".

*Alberta Non-Grid 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: | 3,055 | (62) | 2,949 | (60) | 6,004 | (122) |
| balance as % unearned premium: | 6.3% | - | 6.1% | - | 12.4% | - |
| actual unearned premium: | 48,528 | | | | | |
| less projected: | (991) | | | | | |

## 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[10] 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[11], including IBNR.

In calculating the amounts as percentages of earned premium, the calendar year-to-date earned premium has been used, which includes 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 107.2% rather than 105.8% (the valuation ultimate ratio for accident year 2018), 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 Alberta Non-Grid RSP Summary of Operations due to rounding.)

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[10]"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).

[11]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.

*Alberta Non-Grid 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 | (129) | (1.6%) | (129) | (1.6%) | (258) | (3.1%) | #N/A | #N/A |
| CAY | 8,890 | 107.2% | 533 | 6.4% | 9,423 | 113.6% | #N/A | #N/A |
| TOTAL | 8,761 | 105.7% | 404 | 4.9% | 9,165 | 110.5% | #N/A | #N/A |

("% EP" based on 2018 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. 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 Alberta Non-Grid 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 Dec. 2017 | Actual Jan. 2018 | Projected Feb. 2018 | Projected Mar. 2018 | Projected Dec. 2018 |
| | 2004 | 42 | 42 | 42 | 42 | 42 |
| | 2005 | 13 | 13 | 13 | 12 | 10 |
| | 2006 | 122 | 153 | 145 | 140 | 106 |
| | 2007 | (92) | (86) | (83) | (83) | (54) |
| | 2008 | 99 | 100 | 95 | 93 | 63 |
| | 2009 | 308 | 250 | 239 | 234 | 164 |
| | 2010 | 815 | 762 | 729 | 717 | 497 |
| | 2011 | 909 | 901 | 862 | 845 | 591 |
| | 2012 | 700 | 698 | 666 | 644 | 473 |
| discount rate | 2013 | 2,609 | 2,537 | 2,429 | 2,383 | 1,667 |
| 1.76% | 2014 | 6,400 | 6,207 | 5,775 | 5,224 | 3,084 |
| | 2015 | 13,385 | 13,169 | 12,820 | 12,140 | 7,701 |
| interest rate margin | 2016 | 18,599 | 19,129 | 18,778 | 17,930 | 13,988 |
| 25 basis pts | 2017 | 25,690 | 22,301 | 20,554 | 19,697 | 16,168 |
| | 2018 | - | 3,715 | 5,285 | 6,251 | 26,387 |
| | TOTAL | 69,599 | 69,891 | 68,349 | 66,269 | 70,887 |
| | Change | | 292 | (1,542) | (2,080) | |

*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 Dec. 2017 | Actual Jan. 2018 | Projected Feb. 2018 | Projected Mar. 2018 | Projected Dec. 2018 |
|---|---|---|---|---|---|---|---|
| | 349.1% | 2004 | 36 | 36 | 36 | 36 | 36 |
| | 97.4% | 2005 | 5 | 5 | 5 | 5 | 4 |
| | 87.2% | 2006 | 16 | 9 | 9 | 9 | 6 |
| | 101.5% | 2007 | (127) | (122) | (117) | (116) | (78) |
| | 101.2% | 2008 | 72 | 72 | 69 | 68 | 45 |
| | 94.9% | 2009 | 213 | 160 | 154 | 152 | 102 |
| | 84.3% | 2010 | 652 | 587 | 564 | 558 | 376 |
| | 83.4% | 2011 | 645 | 627 | 602 | 596 | 402 |
| | 101.1% | 2012 | 202 | 210 | 202 | 200 | 135 |
| | 100.1% | 2013 | 1,882 | 1,790 | 1,718 | 1,701 | 1,149 |
| | 112.9% | 2014 | 5,265 | 5,128 | 4,718 | 4,199 | 2,247 |
| | 104.3% | 2015 | 11,273 | 10,909 | 10,582 | 9,947 | 5,873 |
| | 120.6% | 2016 | 15,638 | 16,061 | 15,740 | 14,953 | 11,481 |
| | 112.8% | 2017 | 21,604 | 18,610 | 17,121 | 16,436 | 13,421 |
| | 105.8% | 2018 | - | 3,182 | 4,403 | 5,049 | 22,553 |
| | | TOTAL | 57,376 | 57,264 | 55,806 | 53,793 | 57,752 |
| | | Change | | (112) | (1,458) | (2,013) | |

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

FACILITY
Association

EXHIBIT C

Premium Liabilities

| TABLE EXHIBIT C | Amounts in $000s | | | | |
|---|---|---|---|---|---|
| Premium Liabilities | Actual Dec. 2017 | Actual Jan. 2018 | Projected Feb. 2018 | Projected Mar. 2018 | Projected Dec. 2018 |
| (1) unearned premium (UP) | 50,192 | 48,528 | 48,551 | 49,412 | 50,102 |
| **FOR MEMBER SHARING** | | | | | |
| (2) expected future costs ratio {% of (1)} | 112.4% | 112.4% | 112.4% | 112.5% | 115.1% |
| (3) expected future costs {(1) x (2)} | 56,394 | 54,532 | 54,581 | 55,597 | 57,670 |
| (4) premium deficiency / (deferred policy acquisition cost) | 6,202 | 6,004 | 6,030 | 6,185 | 7,568 |
| **Excluding Actuarial Present Value Adjustments** | | | | | |
| (5) expected future costs ratio {% of (1)} | 106.3% | 106.3% | 106.3% | 106.4% | 108.9% |
| (6) expected future costs {(1) x (5)} | 53,344 | 51,583 | 51,629 | 52,590 | 54,551 |
| (7) premium deficiency / (deferred policy acquisition cost) | 3,152 | 3,055 | 3,078 | 3,178 | 4,449 |

## EXHIBIT D

## Projected Year-end Policy Liabilities

The table below presents the projected policy liabilities as at December 31, 2018, broken down by component.

| Alberta non-Grid ending 2018 | Projected Balances as at Dec. 31, 2018 ($000s) | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | nominal values | | | actuarial present value adjustments (apvs) | | | | | | |
| Acc Yr | Case | IBNR | Total Unpaid | discount | investment PfAD | nominal development PfAD | development PfAD discount | development PfAD | Total apvs | TOTAL |
| 2004 | 26 | 36 | 62 | - | - | 6 | - | 6 | 6 | 68 |
| 2005 | 52 | 4 | 56 | - | - | 6 | - | 6 | 6 | 62 |
| 2006 | 990 | 6 | 996 | - | - | 100 | - | 100 | 100 | 1,096 |
| 2007 | 411 | (78) | 333 | (9) | 1 | 33 | (1) | 32 | 24 | 357 |
| 2008 | 217 | 45 | 262 | (8) | 1 | 26 | (1) | 25 | 18 | 280 |
| 2009 | 790 | 102 | 892 | (28) | 4 | 89 | (3) | 86 | 62 | 954 |
| 2010 | 1,500 | 376 | 1,876 | (69) | 9 | 188 | (7) | 181 | 121 | 1,997 |
| 2011 | 2,763 | 402 | 3,165 | (130) | 16 | 316 | (13) | 303 | 189 | 3,354 |
| 2012 | 5,737 | 135 | 5,872 | (258) | 35 | 587 | (26) | 561 | 338 | 6,210 |
| 2013 | 7,680 | 1,149 | 8,829 | (380) | 53 | 883 | (38) | 845 | 518 | 9,347 |
| 2014 | 12,571 | 2,247 | 14,818 | (667) | 89 | 1,482 | (67) | 1,415 | 837 | 15,655 |
| 2015 | 16,516 | 5,873 | 22,389 | (963) | 134 | 2,776 | (119) | 2,657 | 1,828 | 24,217 |
| 2016 | 21,491 | 11,481 | 32,972 | (1,583) | 198 | 4,088 | (196) | 3,892 | 2,507 | 35,479 |
| 2017 | 28,242 | 13,421 | 41,663 | (2,166) | 292 | 4,875 | (254) | 4,621 | 2,747 | 44,410 |
| PAYs (sub-total): | 98,986 | 35,199 | 134,185 | (6,261) | 832 | 15,455 | (725) | 14,730 | 9,301 | 143,486 |
| CAY (2018) | 34,654 | 22,553 | 57,207 | (2,918) | 400 | 6,693 | (341) | 6,352 | 3,834 | 61,041 |
| claims liabilities: | 133,640 | 57,752 | 191,392 | (9,179) | 1,232 | 22,148 | (1,066) | 21,082 | 13,135 | 204,527 |
| | Unearned Premium | Premium Defiency / (DPAC) | Total Provision | discount | investment PfAD | nominal development PfAD | development PfAD discount | development PfAD | Total apvs | TOTAL* |
| premium liabilities: | 50,102 | 4,449 | 54,551 | (2,064) | 272 | 5,105 | (194) | 4,911 | 3,119 | 57,670 |

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

| policy liabilities: | | | 245,943 | (11,243) | 1,504 | 27,253 | (1,260) | 25,993 | 16,254 | 262,197 |
|---|---|---|---|---|---|---|---|---|---|---|

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 (Sep. 30, 2017)

| Accident Year | Third Party Liability | Accident Benefits | Other Coverages | Total |
|---|---|---|---|---|
| 2004 | 10.0% | 10.0% | 10.0% | 10.0% |
| 2005 | 10.0% | 10.0% | 10.0% | 10.0% |
| 2006 | 10.0% | 10.0% | 10.0% | 10.0% |
| 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% | 6.0% | 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% | 9.8% | 10.0% |
| 2014 | 10.0% | 10.0% | 9.3% | 10.0% |
| 2015 | 12.5% | 10.0% | 11.1% | 12.4% |
| 2016 | 12.5% | 10.0% | 12.5% | 12.4% |
| 2017 | 12.1% | 10.0% | 8.2% | 11.7% |
| 2018 | 11.8% | 10.0% | 5.2% | 9.4% |
| | | | | |
| prem liab | 11.8% | 10.0% | 5.2% | 9.4% |

|  |  |
|---|---|
| discount rate: | 1.76% |
| 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 to Dec. 31, 2018, and are based on more up-to-date information). We have included the most recent valuation selection (1.76%), the prior valuation assumption (1.20%) and the prior fiscal year end valuation assumption (0.55%) 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, 2017 projected Unpaid |
|---|---|---|---|---|---|---|---|---|
| | 0.76% | 1.26% | 1.76% | 2.26% | 2.76% | 3.26% | 1.20% | 0.55% |
| 2004 | - | - | - | - | - | - | - | - |
| 2005 | - | - | - | - | - | - | - | - |
| 2006 | 1,330 | 1,319 | 1,309 | 1,298 | 1,288 | 1,278 | 1,320 | 1,334 |
| 2007 | 692 | 687 | 681 | 676 | 670 | 665 | 687 | 695 |
| 2008 | 370 | 367 | 364 | 360 | 357 | 354 | 367 | 372 |
| 2009 | 2,162 | 2,139 | 2,117 | 2,095 | 2,073 | 2,052 | 2,142 | 2,172 |
| 2010 | 2,754 | 2,721 | 2,689 | 2,657 | 2,627 | 2,597 | 2,725 | 2,768 |
| 2011 | 5,094 | 5,029 | 4,966 | 4,905 | 4,845 | 4,788 | 5,037 | 5,121 |
| 2012 | 10,645 | 10,513 | 10,385 | 10,260 | 10,139 | 10,022 | 10,528 | 10,701 |
| 2013 | 13,576 | 13,397 | 13,226 | 13,058 | 12,894 | 12,737 | 13,419 | 13,651 |
| 2014 | 22,289 | 22,009 | 21,739 | 21,473 | 21,217 | 20,968 | 22,042 | 22,408 |
| 2016 | 45,362 | 44,669 | 44,007 | 43,356 | 42,725 | 42,118 | 44,752 | 45,654 |
| 2017 | 66,776 | 65,786 | 64,842 | 63,923 | 63,032 | 62,176 | 65,905 | 67,193 |
| Total | 202,862 | 199,998 | 197,258 | 194,571 | 191,966 | 189,459 | 200,337 | 204,068 |
| | 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 |
|---|---|---|---|---|---|---|---|---|
| | 0.76% | 1.26% | 1.76% | 2.26% | 2.76% | 3.26% | 1.20% | 0.55% |
| Total | 5,604 | 2,740 | - | (2,687) | (5,292) | (7,799) | 3,079 | 6,810 |
| | 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 |
|---|---|---|---|---|---|---|---|---|
| | 0.76% | 1.26% | 1.76% | 2.26% | 2.76% | 3.26% | 1.20% | 0.55% |
| 2004 | - | - | - | - | - | - | - | - |
| 2005 | - | - | - | - | - | - | - | - |
| 2006 | 1.6% | 0.8% | - | (0.8%) | (1.6%) | (2.4%) | 0.8% | 1.9% |
| 2007 | 1.6% | 0.9% | - | (0.7%) | (1.6%) | (2.3%) | 0.9% | 2.1% |
| 2008 | 1.6% | 0.8% | - | (1.1%) | (1.9%) | (2.7%) | 0.8% | 2.2% |
| 2009 | 2.1% | 1.0% | - | (1.0%) | (2.1%) | (3.1%) | 1.2% | 2.6% |
| 2010 | 2.4% | 1.2% | - | (1.2%) | (2.3%) | (3.4%) | 1.3% | 2.9% |
| 2011 | 2.6% | 1.3% | - | (1.2%) | (2.4%) | (3.6%) | 1.4% | 3.1% |
| 2012 | 2.5% | 1.2% | - | (1.2%) | (2.4%) | (3.5%) | 1.4% | 3.0% |
| 2013 | 2.6% | 1.3% | - | (1.3%) | (2.5%) | (3.7%) | 1.5% | 3.2% |
| 2014 | 2.5% | 1.2% | - | (1.2%) | (2.4%) | (3.5%) | 1.4% | 3.1% |
| 2016 | 3.1% | 1.5% | - | (1.5%) | (2.9%) | (4.3%) | 1.7% | 3.7% |
| 2017 | 3.0% | 1.5% | - | (1.4%) | (2.8%) | (4.1%) | 1.6% | 3.6% |
| Total | 2.8% | 1.4% | - | (1.4%) | (2.7%) | (4.0%) | 1.6% | 3.5% |
| | 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 | Alberta Non-Grid | | | | | | |
|---|---|---|---|---|---|---|---|
| AccountCode Desc | IBNR - Discounted | | | | | M/S IBNR - in $000s | |

| AccYear | 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 |
|---|---|---|---|---|---|---|---|
| 2004 | 42 | (1) | 1 | - | - | - | 42 |
| 2005 | 13 | - | - | - | - | - | 13 |
| 2006 | 122 | 35 | (4) | - | 31 | 25.4% | 153 |
| 2007 | (92) | 3 | 3 | - | 6 | (6.5%) | (86) |
| 2008 | 99 | (2) | 3 | - | 1 | 1.0% | 100 |
| 2009 | 308 | 3 | (61) | - | (58) | (18.8%) | 250 |
| 2010 | 815 | (6) | (47) | - | (53) | (6.5%) | 762 |
| 2011 | 909 | (8) | - | - | (8) | (0.9%) | 901 |
| 2012 | 700 | (24) | 22 | - | (2) | (0.3%) | 698 |
| 2013 | 2,609 | (24) | (48) | - | (72) | (2.8%) | 2,537 |
| 2014 | 6,400 | (222) | 29 | - | (193) | (3.0%) | 6,207 |
| 2015 | 13,385 | (318) | 102 | - | (216) | (1.6%) | 13,169 |
| 2016 | 18,599 | (202) | 732 | - | 530 | 2.8% | 19,129 |
| 2017 | 25,690 | (3,239) | (150) | - | (3,389) | (13.2%) | 22,301 |
| 2018 | - | 5,249 | (1,534) | - | 3,715 | 100.0% | 3,715 |
| **Grand Total** | **69,599** | **1,244** | **(952)** | **-** | **292** | **0.4%** | **69,891** |

EXHIBIT G

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

RSP                 **Alberta Non-Grid**
AccountCode Desc    **IBNR - Undiscounted**                                    IBNR - in $000s

| AccYear | 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 |
|---|---|---|---|---|---|---|---|
| | **Values** | | | | | | |
| 2004 | 36 | (1) | 1 | - | - | - | 36 |
| 2005 | 5 | - | - | - | - | - | 5 |
| 2006 | 16 | - | (7) | - | (7) | (43.8%) | 9 |
| 2007 | (127) | 3 | 2 | - | 5 | (3.9%) | (122) |
| 2008 | 72 | (1) | 1 | - | - | - | 72 |
| 2009 | 213 | (4) | (49) | - | (53) | (24.9%) | 160 |
| 2010 | 652 | (13) | (52) | - | (65) | (10.0%) | 587 |
| 2011 | 645 | (13) | (5) | - | (18) | (2.8%) | 627 |
| 2012 | 202 | (4) | 12 | - | 8 | 4.0% | 210 |
| 2013 | 1,882 | (38) | (54) | - | (92) | (4.9%) | 1,790 |
| 2014 | 5,265 | (158) | 21 | - | (137) | (2.6%) | 5,128 |
| 2015 | 11,273 | (451) | 87 | - | (364) | (3.2%) | 10,909 |
| 2016 | 15,638 | (313) | 736 | - | 423 | 2.7% | 16,061 |
| 2017 | 21,604 | (2,809) | (185) | - | (2,994) | (13.9%) | 18,610 |
| 2018 | - | 4,687 | (1,505) | - | 3,182 | 100.0% | 3,182 |
| **Grand Total** | **57,376** | **885** | **(997)** | **-** | **(112)** | **(0.2%)** | **57,264** |