



Government of the District of Columbia  
Vincent C. Gray, Mayor  
Department of Insurance, Securities and Banking



Chester A. McPherson  
Acting Commissioner

May 13, 2014

VIA EMAIL

Walter Smith  
Executive Director  
DC Appleseed Center  
111 Fourteenth Street, NW, Suite 510  
Washington, DC 20005

Dear Mr. Smith:

I write in response to your letter dated April 25, 2014 requesting information in advance of the surplus review hearing scheduled for June 25, 2014. This response does not address Sections I and II of your letter which contain Appleseed's version of the facts, its characterization of our communications, and its interpretation of the law. Rather, as you agreed in discussions with my staff, the following responds to each specific item of requested information set forth in Section III of your letter. The numbers below correspond to the requests in your April 25, 2014 letter.

In addition, attached is a short memo from Rector & Associates (R&A) with a detailed overview of the Milliman modeling methodology. Although this methodology has been discussed with your team previously, this form of presentation may provide greater clarity.

**ITEM 1**

**Appleseed Request**

1. Stochastic Modeling

DISB states that Rector 'performed a detailed analysis of each of the [13] factors used in Milliman's stochastic modeling process.' McPherson Apr. 18, 2014, Letter at 6. DISB has also provided us the specific gain/loss outcomes produced by the stochastic modeling process that Rector then put through the pro forma modeling. But we have not received two important things that are necessary to understand how Rector used the stochastic model to estimate GHMSI's permissible surplus.

- (a) We have asked for information showing the exact values of the factors Rector relied on as to each of the four selected loss outcomes that Rector used in the pro forma

modeling. We have been advised that Milliman no longer has '[t]he values of the [13] factors that led to each of the selected outcomes.' Because we believe the Commissioner needs to know whether the values of those factors are sufficiently plausible to meet the requirements of MIEAA, we ask that Rector request Milliman to re-run the model and provide the values of the 13 factors that led to each of the four particular loss outcomes that Rector relied on: a 200% RBC threshold at a 98% confidence level; a 375% RBC threshold at a 75% confidence level; a 375% RBC threshold at an 85% confidence level; and a 375% RBC threshold at a 95% confidence level.

**Response:**

*The stochastic modeling software that Milliman uses does not retain the particular values that are selected by the automated software that lead to gain or loss outcomes that are generated by the model.<sup>1</sup> Even assuming that Milliman and GHMSI were willing to disclose those particular values, the software does not retain those values or allow Milliman to request a report detailing those values at the time they are chosen.*

*More importantly, the particular value that was selected by the automated model for each of the 13 risk categories simply is a function of the probability distribution for that category. Accordingly, each selected value does not need to be known—just the probability distributions used to automatically generate the selected values are appropriate. Again, Rector & Associates (R&A) appropriately spent significant time analyzing the 13 risk and contingency events and has provided the DISB with more than sufficient information regarding that analysis to allow the DISB to make an informed decision regarding GHMSI's surplus position.*

(b) We were informed in the April 18 letter that the most severe loss outcome relied on by Rector was 23.3% of non-FEP premium. *Id.* at 9. Yet when that loss is applied to GHMSI's non-FEP premium revenue, as reported at the end of 2013, it produces a loss of only \$313 million, whereas Rector's proposed 958% RBC is designed to protect against a loss of \$760 million (i.e., falling from approximately \$961 million (958% RBC) to \$201 million (200% RBC)). Please explain this apparent discrepancy. It may be that the additional loss is caused by assumptions used by Rector in the pro forma modeling, but as mentioned earlier and as discussed below, we do not yet know what those assumptions are.

**Response:**

*The manner in which loss outcomes and premium income are used in the final step of the projection model—the pro forma financial projection step—does not result in discrepancies or*

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<sup>1</sup> My April 18, 2014 correspondence responded to this same question with the following statement: "The values of the 12 factors that led to each of the selected loss outcomes were not retained by the Milliman modeling software and were not provided to R&A."

*errors in the projection model. Your analysis incorrectly relied on GHMSI's non-FEP premium, as reported at the end of 2013, to project the surplus necessary for GHMSI to maintain a 200% RBC level with a 98% confidence level.*

*Using GHMSI's 2013 non-FEP premium is incorrect for two reasons:*

- *First, the appropriate premium to be used in the pro forma financial projection step is based not just on GHMSI's non-FEP premium, but also takes into account 50% of non-FEP premium for CareFirst BlueChoice, Inc. (BlueChoice) to recognize GHMSI's 50% ownership in BlueChoice. On April 1, 2014, you received email correspondence from the DISB that included a May 16, 2013 memorandum that summarizes R&A's detailed analysis of the probability distribution for premium growth (the 13<sup>th</sup> factor used in the stochastic model process) that R&A asked Milliman to incorporate into the stochastic modeling process. The memorandum clearly describes how BlueChoice's projected premium growth was included in the analysis.*
- *Second, projected non-FEP premium for GHMSI and BlueChoice, not just GHMSI's non-FEP premium as of the end of 2013, should be used in the pro forma financial projection step. Again, the probability distributions for premium growth selected by R&A and its analysis of the selections is described in R&A's May 16, 2013 memorandum.*

*The premium levels to which R&A's selected probability distributions for premium growth were applied were based on information made available to Milliman when it performed its analysis in 2011. Using a three-year projection period beginning in 2012 and the midpoint of R&A's premium growth probability distribution (a 12.4% premium growth level), the average annual projected premium level for the three year period was \$3,030.8 million.*

*In addition, in attempting to calculate the amount of surplus necessary to maintain a desired RBC level at a desired confidence level, it is necessary to take into account the effect of the assumptions underlying the pro forma financial statements, as described in response to question 3, below.*

## ITEM 2

### Appleseed Request

#### 2. Rating Adequacy and Fluctuation Factor

As described above, we have been seeking information regarding the rating adequacy and fluctuation risk factor, changes to which the Rector Report states 'had the most significant impact on the modeling results.' Rector Report at 21. The March 6 FTI memorandum indicates that this factor was the single largest driver in the increase in Rector's estimated surplus needs from 2009 to 2013. Toole Mar. 6, 2014 Memorandum at 3. According to that memorandum, the rating adequacy and fluctuation factor accounted for a 180-

percentage-point increase in Rector's estimated surplus need from 2009 to 2013. *Id.* However, the April 18 letter from DISB states that Rector estimates that this factor accounted for only a 150-percentage-point increase. McPherson Apr. 18, 2014, Letter at 7. In addition, while we were told in the April 18 letter that Rector could not quantify how it derived the increase to this factor, it did say that it estimated that 100 to 150 percentage points of the increase was due to health reform. *Id.* at 5. This leads to two requests:

- (a) Please state whether Rector estimates that its changes to the rating adequacy and fluctuation factor increased surplus from 2009 to 2013 by 150 percentage points or by 180 percentage points.

**Response:**

*As a threshold matter with respect to quantifying the differences in findings between the 2009 and 2013 analysis of GHMSI's surplus position, it simply is impossible to exactly quantify the impact any specific factor had on the RBC calculations. The Milliman model is a complex projection model that attempts to capture all key aspects of a health insurer's financial and business operations. Because of the inherent complexity of the model, the exact numerical effect of changing one particular model variable is not exactly quantifiable.*

*Given the limitations on the ability to quantify these differences, there have been several responses to your questions with respect to quantifying the differences in findings between the 2009 and 2013 analysis. In response to questions posed in your January 29, 2014 correspondence, the FTI March 6, 2014 memorandum included a summary of R&A's analysis of the drivers of the change in GHMSI's required surplus position between R&A's 2009 and 2013 analysis. One of the risk categories that was identified as a driver of the change in the required surplus position was the rating adequacy and fluctuation category. As indicated on Page 1 of the FTI memorandum:*

*We were able to estimate the relative impact of quantitative adjustments to assumptions (e.g. the change in the Rating Asset Adequacy and Fluctuation assumption from 2009 to 2013)." [Emphasis added.]*

*R&A's estimate, as provided in the memorandum, was that the revisions made to the probability distributions for the rating adequacy and fluctuation category had an impact of 180 percentage points on RBC findings between the 2009 and 2013 analysis.*

*The information contained in the March 6 memorandum was an estimate of the relative impact of revisions to 13 risk categories and did not represent an extensive analysis of revisions to the rating adequacy and fluctuation category. The response was providing a description of the relative impact of revisions to the 13 risk categories.*

*In your March 14, 2014 correspondence, you asked a series of very specific questions regarding exact quantifications of the differences in findings between the 2009 and 2013 analysis of GHMSI's surplus position. These questions included new questions relating to the effect of different confidence levels on the quantification of those differences.*

*As a result, R&A performed additional analysis to estimate RBC percentage point differences resulting for revisions to the rating adequacy and fluctuation risk category, taking into account the different confidence levels used in the 2009 and 2013 surplus analysis.<sup>2</sup> This additional analysis resulted in a refinement to the previously estimated 180 percentage point difference between the 2009 and 2013 analysis.*

*As indicated on page 7 of my April 18, 2014 correspondence to you:*

*... R&A estimated the increase in necessary surplus related to this assumption [the rating adequacy and fluctuation risk category] to be approximately 150 basis points to maintain 200% RBC at a 98% confidence level and approximately 170 basis points to maintain 375% RBC at a 95% confidence level.*

*Again, it is important to recognize that although R&A has performed extensive analysis to quantify the RBC percentage point differences to each risk category resulting from the 2009 and 2013 surplus, it simply is not possible to quantify the differences to an exact number of RBC percentage points.*

- (b) Other than the 100- to 150-percentage-point increase attributable to health reform, please state which other factors account for the remainder of the increase and the amount you estimate is attributable to each of those factors.

**Response:**

*Based on this question, there may be a misunderstanding of some of the information contained on page 5 of my April 18, 2014 correspondence. Pages 4 and 5 of my correspondence state:*

*It is important to note that in Milliman's analysis of GHMSI's surplus needs as of 12/31/11, Milliman only took into account in its stochastic modeling process those health care reform requirements that were in effect prior to 1/1/14. For those health care reform requirements that were effective on or after 1/1/14, Milliman estimated that the impact of those health care reforms could increase GHMSI's surplus target range by 100% to 150% of RBC in addition to the amount estimated in connection with its stochastic testing. [Emphasis added.]*

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<sup>2</sup> In the 2009 analysis, the confidence levels and RBC thresholds that were selected included a 200% RBC level with a 99% confidence level. In the 2013 analysis, the selected thresholds included a 200% RBC level at a 98% confidence level.

*The estimated 100% to 150% of RBC basis points was Milliman's estimate of the potential impact of health care reforms that were effective on or after 1/1/14 on GHMSI's surplus position and how Milliman incorporated certain aspects of health care reform into Milliman's work. You may have understood the April 18 response to mean that Milliman's estimate of 100% to 150% RBC basis points somehow was part of or incorporated into R&A's analysis. It was not. R&A's approach to including the effects of health care reform in the projection model is described on page 20 of the R&A 2013 Report.*

### ITEM 3

#### Appleseed Request

##### 3. Pro Forma Financial Projections

We have sought information necessary to explain exactly how Rector used the pro forma financial projections to estimate permissible surplus under MIEAA. As just noted, Rector appears to have indicated that the largest loss outcome entered into the pro forma financial projections is approximately \$313 million, yet its target surplus protects against a loss of approximately \$760 million. Thus, it appears that the assumptions used in the pro forma modeling account for well over half of the projected loss assumed in Rector's calculations. Yet as explained earlier, we have not received information about all those assumptions, even though Rector specifically reviewed and relied on them. We therefore request the following information:

- (a) Please explain of all assumptions underlying the pro forma financial projections, including those that were not disclosed in the April 18 letter.

#### Response:

*The following are all of the baseline assumptions underlying the pro forma financial projections:*

- i. Average expected investment yield -- 3.75%, including realized and unrealized capital gains  
Source: Average investment yield provided by GHMSI*
- ii. Pricing margin for non-FEP insured business – 2.8%  
Source: Average pricing margin underlying Milliman's 2001 surplus analysis (see page 8 of Milliman 2011 Report)*
- iii. Tax carryback assumptions -- tax loss carryback was assumed to be available at the onset of the loss cycle in the amount of \$100 million (equal to one year's expected pre-tax net gain)*

*Source: Based on calculation of one year's expected pre-tax net gain, using pro forma financial statement assumptions and assumed underwriting gain for non-FEP insured business of 2.8%*

- iv. *Other tax assumptions -- annual tax rate of 28.2% (average of 20% for GHMSI and 36.5% for BlueChoice); no tax loss carry forwards applicable (non-admitted under the conditions of the loss scenarios); and any existing deferred tax asset is non-admitted*  
*Source: Tax rates provided by GHMSI staff and treatment of tax carry forwards and existing deferred tax assets based on Milliman and GHMSI discussions*
- v. *Pro forma financial statements projection time period -- 3 years*  
*Source: projection model*
- vi. *ASC average annual growth rate (claims plus fee income) – 8.3%*  
*Source: assumes growth rate of 8% for per capita claims; 3% for per capita expenses; and .5% for membership*
- vii. *Other income assumptions -- \$1.1 million annually (includes Non-Risk Other, FEP service center (SBP) and other subsidiaries (NCIA, Willse and Associates, and NCAS))*  
*Source: GHMSI forecast for March 29, 2011*
- viii. *FEP net gain -- .2% of FEP premium*  
*Source: Based on review of review of GHMSI 2010 experience and GHSMI forecast for March 29, 2011*
- ix. *ASC net gain -- .8% of claims plus fee income*  
*Source: GHSMI forecast for March 29, 2011*

*It is important to point out that the assumptions i – iv, as listed above, as well as a description of the pro forma financial statement modeling, were included in the Milliman Development of Optimal Surplus Target Range Report dated May 31, 2011, a public report that has been available to you since it was released to the public on June 6, 2012. In addition, the probability distributions with respect to premium growth that were used in the model at R&A's request were described in the 2013 R&A Report.<sup>3</sup>*

*You have only asked for the assumptions used in the pro forma financial statement modeling. The pro forma financial statements also employ certain values as of 12/31/11 as starting point values.*

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<sup>3</sup> See page 30 of the R&A 2013 Report.

*In the interest of providing you with a full understanding of the pro forma financial statement modeling process, Milliman and GHMSI have agreed to provide the values as of 13/31/11 that were used to develop the pro forma financial statements, which are:*

- i. Estimated 2011 Non-FEP Insured Claims:
  - a. GHMSI -- \$1,119.5 million*
  - b. BlueChoice -- \$1,537.5 million**
- ii. Estimated 2011 Non-FEP Insured Total Operating Expenses:
  - a. GHMSI -- \$249.4 million*
  - b. BlueChoice -- \$371.4 million**
- iii. Estimated 2011 FEP Premium (GHMSI) -- \$1,520.7 million*
- iv. Estimated 2011 ASC Fee Income (GHMSI) -- \$68.0 million*
- v. Estimated 2011 ASC Claims Reimbursement (GHMSI): \$1,206.8 million*
- vi. Authorized Control Level Risk Based Capital (RBC-ACL) -- RBC-ACL values for each year were projected from values underlying the development of the reported 2010 GHMSI and BlueChoice values. The resulting projected RBC-ACL values were comparable, when expressed as a percentage of insured premium, to the reported 2010 values.*
- vii. Mean Invested Funds for each year were assumed equal to:
  - a. 7.8% of insured premium, plus*
  - b. projected mean surplus, less*
  - c. Investment in Real Estate and EDP Equipment, statutory basis:
    - 1. GHMSI: \$2.4 million*
    - 2. BlueChoice: \$0.0***
- viii. Deferred Tax Asset Assumed Not Admitted During Loss Cycle
  - a. GHMSI \$12.4 million*
  - b. BlueChoice: \$11.5 million**

*Values i-v are based on GHMSI forecasts as of March 29, 2011. Values vi- viii are based on GHMSI and BlueChoice 2010 Annual Statement and Risk-Based Capital filings.*

(b) If any undisclosed assumptions are considered confidential, please explain why they are confidential.

*Not applicable.*



(c) Please provide a statement indicating whether the undisclosed assumptions will be made available if DC Appleseed enters a confidentiality agreement.

*Not applicable.*

#### ITEM 4

#### Appleseed Request

##### 4. Change in Target Surplus Ratio

As described above, we have received inconsistent and incomplete explanations regarding the reasons that Rector's target surplus for avoiding 200% RBC increased from 600% RBC (at 99% confidence) in 2009 to 958% RBC (at 98% confidence) in 2013. We estimate, based on normal distributions, that a 98% certainty would lower the 600% calculated in 2009 to 553%, in which case the increase is actually 405 percentage points. In the April 18 response, DISB states that Rector considers that estimate to be "reasonable." *Id.* at 5. Through that response, Rector indicated that in 2009, it accounted for potential management interventions in the loss curve, resulting in a 190-percentage-point reduction in estimated surplus need. *Id.* at 9. The April 18 letter further indicated that in its recent surplus analysis, Rector instead 'performed a detailed analysis of each of the 12 factors that are used in Milliman's stochastic modeling process.' *Id.* This leaves unexplained how Rector's analysis of the 12 factors took account of potential management intervention, what impact this analysis had on surplus, and what the precise adjustments were that account for Rector's \$400 million increase in recommended surplus. We therefore request the following information:

- (a) Please explain how Rector's 'detailed analysis of the [13] factors that are used in Milliman's stochastic modeling process' accounted for the two elements of management intervention described in the 2010 Rector Report as 'Pricing Margins and Underwriting Standards' and 'Infrastructure Investments.' Please answer separately with respect to each of the 13 factors.

#### Response:

*The element of management intervention described in the 2010 Rector Report as "Pricing Margins and Underwriting Standards" was included in R&A's analysis of the probability distributions for the rating adequacy and fluctuation category because this category captures management intervention that could occur with respect to management's ability to adjust pricing margins and underwriting standards.*

*The element of management intervention described in the 2010 Rector Report as "Infrastructure Investments" was included in R&A's analysis of the probability distributions for the unidentified development and growth category.*

- (b) Please quantify how much reduction in surplus this analysis produced, in comparison with the 190-point reduction the analysis produced in 2009.

Response:

*In addition to the general types of quantification problems described above relative to other aspects of R&A's work, R&A approached the concept of management intervention differently in 2013 than in 2009. In 2009, R&A made adjustments for possible management intervention by adjusting the results of the stochastic modeling process (referred to as the "loss curve" in the R&A 2010 Report). That adjustment took place after the stochastic modeling process was completed but before a loss outcome was selected for inclusion in the pro forma financial statement process.*

*In contrast, in its 2013 analysis, R&A did not adjust the "loss curve." Rather, R&A considered aspects of possible management intervention as it analyzed the probability distributions for various risk and contingency factors and made adjustments to those probability distributions.*

*This difference in approach between 2009 and 2013, combined with the general difficulty in quantifying the impact of specific factors, make it impossible for R&A to quantify adjustments made in 2013 that are specifically attributable to possible management intervention. There are too many considerations that went into the selection of probability distribution factors to be able to isolate considerations related solely to possible management intervention. However, as described below, R&A was able to describe, generally, how possible management intervention factored into its probability distribution adjustments in 2013.*

*Further, unlike 2013, because the adjustments made in 2009 were separated from other adjustments and dealt with through an adjustment to the "loss curve," R&A was able to estimate the impact possible management intervention had on the amount of surplus determined to be needed in its 2009 analysis. Those estimates are set forth below.*

*Effect of Management Intervention Adjustments on 2013 RBC Analysis.*

*In 2009, there were three components related to the management intervention adjustment: (1) reducing reserve margins, (2) pricing margins and underwriting standards, and (3) infrastructure investments.*

*Reducing Reserve Margins*

*As I indicated in my April 18, 2014 response, R&A did not take into account in 2013 the potential management action of reducing GHMSI's reserve margins and releasing portions of reserves into surplus. DISB told R&A that it is not appropriate for GHSMI to alter reserves as a method of improving GHMSI's financial position. Accordingly, R&A did not take this type of management intervention action into account in its 2013 analysis.*

Pricing Margins and Underwriting Standards

*With respect to pricing margins and underwriting standards, R&A indicated in the R&A 2010 Report that:*

*It is reasonable to expect that if management were concerned about crossing a particular RBC threshold, management would react by increasing pricing margins and/or implementing more stringent underwriting standards.*

*So there were two subcomponents at work here: increasing pricing margins and implementing more stringent underwriting standards.*

*As to increasing pricing margins, R&A recognized management's ability to increase pricing margins in its 2013 analysis of the probability distributions for the rating adequacy and fluctuation category. For example, R&A took into account a short timeframe within which GHMSI's management could obtain approval from regulators of premium rate increases, as compared to the timeframe used by Milliman in its analysis.*

*As to implementing more stringent underwriting standards, it is, of course, no longer possible for insurers to employ underwriting techniques due to health care reform restrictions enacted by ACA. Accordingly, R&A appropriately did not consider management's ability to change underwriting standards in its 2013 analysis of the probability distributions for the rating adequacy and fluctuation risk category.*

Infrastructure Investments

*R&A indicated in the R&A 2010 Report that:*

*It is reasonable to expect that if management were concerned about crossing a particular RBC threshold, management would react by delaying or canceling at least some infrastructure investments.*

*In its 2013 analysis, R&A made adjustments to the probability distributions for the unidentified development and growth risk categories, as described in pages 25-27 of the R&A 2013 Report. R&A also recognized changes occurring in infrastructure needs in the health care market that affected R&A's adjustments to the probability distributions. The 2013 Report indicates that:*

*Although we believe that GHMSI should be able to anticipate significant portions of the provision for growth and development based on its recent history, we recognize the rapid changes occurring in the health care market due to health care reform and unanticipated technology and infrastructure needs.*

*However, R&A also made adjustments in the probability distributions relative to this category by, for example, eliminating what Milliman had included as an automatic component of infrastructure spending each year. R&A made changes to the probability distributions that had the effect of eliminating such automatic infrastructure expenditures.*

*Effect of Management Intervention Adjustments on 2009 RBC Analysis.*

*As noted above, because the adjustments for possible management intervention made in 2009 were specifically identified and dealt with through an adjustment to the “loss curve,” R&A was able to estimate the impact possible management intervention had on the amount of surplus determined to be needed in its 2009 analysis.*

*Before providing that information, however, the question above does not fully set forth the quantification information provided in the April 18, 2014 response to your March 14, 2014 questions. You indicate in your question, above, that:*

*Rector indicated that in 2009, it accounted for potential management interventions in the loss curve, resulting in a 190-percentage-point reduction in estimated surplus need.*

*Instead, the April 18 response stated:*

*In R&A’s 2009 analysis, the effect of making loss curve adjustments to take into account potential management intervention actions affected the amount of surplus needed to maintain 200% RBC at a 99% confidence level by reducing the required surplus by 190 basis points. Similarly, in 2009 these adjustments affected the amount of surplus needed to maintain 375% RBC at a 95% confidence level by reducing the required surplus by 90 basis points. [Emphasis added.]*

*R&A estimated the impact that the 2009 loss curve adjustments for the three components of management intervention had on the amount of surplus determined to be needed in its 2009 analysis, to maintain both 200% RBC at a 99% confidence level and 375% RBC at a 95% confidence level. Subject to various caveats described above, regarding the impossibility of specifically quantifying the effect of various adjustments, here are R&A’s estimates for the various components of the adjustments made in 2009 relative to possible management intervention:*

<i>Threshold RBC and Confidence Level</i>	<i>Effect of Loss Curve Adjustments for 200% RBC at a 99% Confidence Level (Expressed as Reduction in RBC basis points)</i>	<i>Effect of Loss Curve Adjustments for 375% RBC at a 95% Confidence Level (Expressed as Reduction in RBC basis points)</i>
<b>Reserve Margins</b>	<b>70 basis points</b>	<b>35 basis points</b>
<b>Pricing Margins and Underwriting Standards</b>	<b>70 basis points</b>	<b>55 basis points</b>
<b>Infrastructure Investments</b>	<b>50 basis points</b>	<b>0 basis points</b>
<b>Total Effect of Loss Curve Adjustments for Management Intervention</b>	<b>190 basis points</b>	<b>90 basis points</b>

(c) Please quantify the various adjustments Rector made that account for the difference between the 553% RBC that Rector calculated was needed in 2009 as compared with the 958% RBC needed now (in each case the calculation being surplus needed to avoid falling to 200% RBC with 98% confidence).

**Response:**

*As a threshold matter with respect to quantifying the differences in findings between the 2009 and 2013 analysis of GHMSI's surplus position, it simply is impossible to exactly quantify the impact any specific factor had on the RBC calculations. The Milliman model is a complex projection model that attempts to capture all key aspects of a health insurer's financial and business operations. Because of the inherent complexity of the model, the exact numerical effect of changing one particular model variable is not quantifiable.*

*Further, this question, in effect, is raising the same issues that were raised in question three of your March 14, 2014 correspondence, which was responded to in detail in pages 3 – 7 of the April 18, 2014 correspondence. Rather than repeat the same response here, please refer to the detailed response to question three of the April 18 correspondence.*

*Finally, in the interest of providing further clarity with respect to my April 18 response, the following chart might be helpful for your review.*

<i>Estimated Effect of Assumption Changes Between 2009 Analysis and 2013 Analysis On RBC Findings</i>	
<b>Confidence Level Change</b>	<b>-47 basis points</b>
<b>Premium Growth Assumptions</b>	<b>40 basis points</b>
<b>Rating Adequacy and Fluctuation Risks</b>	<b>150 basis points</b>
<b>Equity Portfolio Risks</b>	<b>70 basis points</b>
<b>Management Intervention</b>	<b>190 basis points</b>
<b>ASC Default Risks</b>	<b>-20 basis points</b>
<b>Bond Interest Rate Risks</b>	<b>-20 basis points</b>
<i>Total Estimated Basis Point Change</i>	<i>363 basis points<sup>4</sup></i>

As indicated in the April 18, 2014 Scheduling Order, this is the last response to Appleseed's questions prior to the June 25, 2014 hearing on this matter.

Sincerely,



Chester A. McPherson  
Acting Commissioner

Enclosure

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<sup>4</sup> It is important to note that these RBC basis point amounts are estimated amounts and are not exact quantifications of the effect of assumptions changes between R&A's 2009 and 2013 analysis.

To: Philip Barlow, Associate Commissioner

From: Sarah Schroeder



Date: May 12, 2014

Re: Overview of Milliman Modeling Methodology

## **Overview of Milliman Modeling Methodology**

As previously indicated, the R&A Report contains a detailed description of the Milliman modeling methodology that was used as the basis of our analysis (pages 9-11 of the R&A Report). We think it would be helpful to provide a detailed written overview of the model to ensure that all have a complete understanding of the project model.

### **Step 1 of the Projection Model -- Stochastic Modeling Process.**

The first step in the projection model is to use a stochastic modeling process to generate 500,000 potential gain or loss outcomes.<sup>1</sup> To generate the 500,000 potential outcomes, Milliman uses 13 different categories of potential risks and contingencies arising from GHMSI's operations, or risk "factors".<sup>2</sup>

To be clear, each category of a potential risk or contingency (each "factor") consists of a series of probabilities that the risk or contingency event will result in a specified percentage change in GHMSI's surplus, expressed as a percentage of GHMSI's non-FEP insured premium. In other words, each of the 13 categories of risk or contingency events is

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<sup>1</sup>The R&A Report refers to hundreds of thousands of potential gain or loss outcomes that are generated by the stochastic modeling process, which, in this case, is a reference to 500,000 potential gain or loss outcomes generated for the GHMSI analysis.

<sup>2</sup> Twelve of these categories and the probability distribution for each category were set forth in 12 charts attached to correspondence from Milliman that previously was provided to DC Appleseed as part of your March 14, 2014 response to DC Appleseed's request for information.

With respect to the 13<sup>th</sup> category, the Milliman model did not initially incorporate a probability distribution with respect to GHMSI's projected premium growth into its projection model. As described in the R&A Report, Milliman subsequently incorporated the probability of premium growth levels in its projection model (see page 19-20 and pages 28-30 of the R&A Report) at R&A's request.

expressed in the form of *its own* probability distribution of the likelihood that each risk or contingency will occur and the accompanying severity of the event.

To perform the stochastic testing, Milliman input all of the probability distributions for each of the 13 categories of risk or contingency events into its automated projection model. Based on the probability that each event will occur and the associated severity of the event, the automated model ran 500,000 combinations and permutations pertaining to the various probability distributions to generate gain or loss outcomes. The number of times that any specific value for one of the 13 events regarding a particular severity is selected to generate each of the 500,000 gain or loss outcomes is based on the likelihood that the event will occur (i.e., its probability).

DC Appleseed has asked for a description of the extremely adverse events leading to the most extreme loss outcomes. DC Appleseed also has suggested that the DISB needs to know the specific values of the 13 categories that generated the four particular loss outcomes that R&A requested from Milliman.

On this point, it is important to understand how the modeling process works and key aspects of the work that we performed during this review: analyzing the probability distributions for the 13 risk and contingency event categories and, where appropriate, making adjustments to the probability and severity of each event. The particular value that was used to generate each gain or loss outcome simply is an automated function of the probability distribution for that category. Neither Milliman nor R&A selected the specific values that led to the selected loss outcomes. Rather, these values were generated automatically by the stochastic modeling software based on the selected probability distributions.

Because the particular value that was generated by the automated model simply is a function of the probability distribution for that category, it is not necessary to know each selected value—we simply need to know that the probability distributions used to automatically generate the selected values are appropriate. Again, R&A appropriately spent significant time analyzing the 13 risk and contingency events and has provided the DISB with more than sufficient information regarding that analysis to allow the DISB to make an informed decision regarding GHMSI's surplus position.

### **Step 2 of the Projection Model – Selection of Loss Outcomes.**

The second step in the projection model begins with ranking the 500,000 gain or loss outcomes, as generated by the stochastic model process, from the most favorable gain outcome to the least favorable loss outcome. A loss outcome, as calculated by the projection model, is expressed in the form of the change in GHMSI's surplus as a percentage of non-FEP premium.

Ranking the 500,000 gain and loss outcomes is an automated process that the projection model performs after Step 1 is complete (the stochastic model process). These ranked gain and loss outcomes represent a series of data points from which one or more of these data



points—or gain or loss outcomes—can be chosen as an input into the final step in the projection model—the development of a pro forma financial statement for GHMSI.

The decision that needs to be made in the identification of a particular loss outcome for input in the pro forma financial statement is choosing the level of confidence needed to ensure that GHMSI's surplus does not fall below a selected RBC level.<sup>3</sup> For example, if R&A determined that a particular RBC level should be satisfied at a 98% confidence level, R&A would ask Milliman to use the loss outcome that leads to the 98<sup>th</sup> worst outcome of the 500,000 gain and loss outcomes, as generated by the stochastic model process, for input into the pro forma financial statement.

DC Appleseed has asked for all 500,000 ranked gain and loss outcomes. It is important to understand that the automated process by which the gain and loss outcomes are generated simply is a step in the modeling process. Those outcomes are based on the probability distributions for each of the 13 categories of risk or contingency events. It is not necessary to know each gain or loss outcome that resulted from the stochastic model process—we simply need to know that the probability distributions used to automatically generate the loss and gain outcomes are appropriate and which loss outcome, for example, is the 98<sup>th</sup> worst outcome. Again, R&A appropriately spent significant time analyzing the 13 risk and contingency events and has provided the DISB with more than sufficient information regarding that analysis to allow the DISB to make an informed decision regarding GHMSI's surplus position.

### **Step 3 of the Projection Model – Pro Forma Financial Statement Process.**

The third and final step in the projection model is to determine the amount of surplus (expressed as an RBC level) that GHMSI needs to allow it to maintain a specific RBC level with a selected degree of confidence. The necessary amount of surplus is calculated by including a particular loss outcome, as generated and selected in Step 2, and incorporating that loss outcome into a pro forma financial statement for GHMSI.

The pro forma financial statement is a tool developed by Milliman to determine what the impact on GHMSI's surplus would be if the selected loss outcome were in fact to occur. The pro forma consists of a three-year projected income statement for GHMSI that is constructed in the following manner:

- Milliman began to build the pro forma income statement by inputting values for specific line items that act as the starting values as of 12/31/11 for those statement items. The values for these specific line items were provided by GHMSI to Milliman for purposes of building the pro forma income statement. These values were based either on forecasted figures provided to Milliman by GHMSI or on annual statement information. Although DC Appleseed did not specifically requested the values for these specific items, GHMSI and Milliman agreed to provide those values. You provided these values

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<sup>3</sup> Because this aspect of the analysis of GHMSI's surplus position focuses on GHMSI's potential adverse financial conditions, only loss outcomes (not gain outcomes) are selected for input into the pro forma financial statements.

and Milliman's source for the values in your response to DC Appleseed's question 4 in its 4/25/14 letter.<sup>4</sup>

- By performing calculations that used those specific line items provided by GHMSI, Milliman then developed values as of 12/31/11 for additional line items in the pro forma income statement. For example, GHMSI provided Milliman with a starting value for estimated 2011 non-FEP insured (one of the forecasted figures provided by GHMSI to Milliman). From that starting value, Milliman calculated other pro forma income statement line items.
- Once all of the necessary line items were calculated and input into the pro forma statement, the completed pro forma income statement as of 12/31/11 acted as the starting point for the next stage in the pro forma income statement development process.
- Taking the pro forma income statement as of 12/31/11 as the starting point, Milliman next applied the selected loss outcome (calculated and chosen as described in Step 2, above) to construct a three-year pro forma income statement for 2012-2014.

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<sup>4</sup> Milliman provided these values, as well as assumptions used in the pro forma income statement and additional information concerning the pro forma model, to R&A to be provided in response to DC Appleseed's 4/25/14 questions. These assumptions and values, as well as the additional information concerning the pro forma model provided in this response, are consistent with those underlying Milliman's May 31, 2011 report for CareFirst titled "Group Hospitalization and Medical Services, Inc.; Development of Optimal Surplus Target Range" (Milliman 2011 Report). Milliman requested that certain disclosures and limitations on the use of the information it has been provided be included in the information we provide to you.

The following disclosure and limitations apply to the information described above, as well as other materials provided to R&A that relate to the Milliman 2011 Report and R&A's review of that report. The referenced materials relate to the Milliman 2011 Report. They should be considered only in connection with that report; applicable terms and concepts are not repeated here. Judgments as to the conclusions contained in this material should be made only after studying that report in its entirety.

The Milliman 2011 Report and the material described in the response were developed for the exclusive use of GHMSI management, for its internal consideration in connection with surplus targets. Milliman understands that GHMSI may wish to share this material with regulators and their professional advisors in the District of Columbia, Maryland and Virginia, or other appropriate regulators. Milliman has granted permission, so long as the entire Milliman 2011 Report is provided. Milliman recommends that any party receiving this material have its own actuary or other qualified professional review this material to ensure that the party understands the assumptions and uncertainties inherent in our estimates. Milliman does not intend to benefit any third party either through this analysis or by granting permission for this material to be shared with other parties. This information is provided subject to the condition that it is for use only in DISB proceedings related to 2011 GHMSI surplus.

In developing this material Milliman relied on data and other information provided by GHMSI. Milliman did not audit or verify this data or information. If the underlying data or information is inaccurate or incomplete, the results of Milliman's analysis may likewise be inaccurate or incomplete. It is certain that the expectations for GHMSI in the future and the subsequent actual experience of GHMSI will not conform exactly to the assumptions used in this analysis. The authors of this material are Consulting Actuaries for Milliman, are members of the American Academy of Actuaries, and meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinions contained herein.

- In addition to inputting the selected loss outcome into the pro forma income statement, the income statement was constructed to include certain assumptions with respect to GHMSI's operations during the projection period. For example, Milliman's assumptions included investment income of 3.75% on invested assets during the three-year projection period. These assumptions were based on figures provided to Milliman by GHMSI and assumptions developed by Milliman. All of the assumptions that were incorporated into the pro forma income statement's construction and the source of those assumptions are described in your response to question 4.
- As with the values that act as starting values for specific line items in the pro forma, GHMSI provided Milliman with the assumptions that were used to construct the income statement. These values were based on forecasted figures that were developed by GHMSI.
- As the final step in the pro forma financial statement process, Milliman determined how much surplus GHMSI would need at the beginning of the three-year projection period to maintain a specified RBC level at a specified confidence level at the end of the three-year projection period. For example, if the decision was made that GHMSI should maintain a 200% RBC level at a 98% confidence level, Milliman would calculate the amount of surplus (expressed as an RBC level) that GHMSI would need at the beginning of the projection period to maintain a 200% RBC level at a 98% confidence level at the end of the projection period.

DC Appleseed has asked questions regarding the assumptions with respect to GHMSI's operations during the projection period that were used to construct the three-year pro forma income statement, as well as repeated questions regarding R&A's review of those assumptions. DC Appleseed's April 25, 2014 correspondence also states on page 7 that: "...on April 1, DISB for the first time stated that the pro forma projection model incorporates premiums, losses, investment income, other income and taxes over a three-year period."

As a threshold matter, we think it is important to point out that several of the key assumptions that Milliman used in the pro forma income statement model, as well as the manner in which Milliman developed its pro forma model, were described in the Milliman Development of Optimal Surplus Target Range Report dated May 31, 2011, a public report that has been available to you since it was posted on the DISB website on June 7, 2012.<sup>5</sup> The fact that Milliman used assumptions to develop the pro forma income statement model—in fact, the actual value of key assumptions-- is not new information that was not publicly available to DC Appleseed.

Our analysis of the projection model included a review of all of the assumptions used in the Milliman pro forma income statement model. We found those assumptions to be reasonable and did not believe it was necessary or appropriate to make any adjustments to those assumptions as they were used by Milliman (i.e., as baseline assumptions). However, as described below, we effectively made numerous adjustments to some of those baseline

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<sup>5</sup> See pages 21-22 of the Milliman 2011 Report. The assumptions described in the 2011 Report include the pricing margin on non-FEP insured business; investment earnings rate; and significant tax information.

assumptions through the probability distribution selections made as a part of Step 1, described above.

Certain assumptions that Milliman needed to use to build the pro forma financial statement—for example, investment earnings and pricing margins—are elements of GHMSI's operations that are captured in the 13 risk and contingency categories. For example, three of the 13 risk categories consist of equity portfolio risks, bond interest rate changes, and bond portfolio impairment risks, which are categories that capture the risks associated with GHMSI's investment portfolio—in other words, its investment earnings.

The probability distributions for each of the 13 risk categories represent the likelihood that each risk or contingency will occur and the accompanying severity of the event. By taking into account in those probability distributions the risks associated with assumptions used to build the pro forma financial statement (e.g., risks associated with the investment earnings assumption, as captured in the three risk categories relating to GHMSI's investment portfolio), our extensive analysis of the probability distributions for the 13 risk categories in effect extended to analyzing the baseline assumptions and possible deviations from those baseline assumptions.

I hope this analysis and information is helpful. Please do not hesitate to contact me with any questions.